

VOLUME - I - TEXT

**Scheme of Mining**  
(Under Rule - 12 of MCDR - 1988)  
&  
**Progressive Mine Closure Plan**  
(Under Rule - 23B of MCDR-1988)

**BALDA BLOCK IRON MINE**  
**OF**

**M/s SERAJUDDIN & CO**

Extent - 335.594 Hectares

Date of Lease Execution - 21.06.1999

Expiry date of lease - 02.12.2017

अनुमोदित  
**APPROVED**

Mineral - Iron Ore

Type of Land - Forest (268.133 Ha & Non Forest 77.461 Ha)

Category of Mine - A Category (Fully Mechanized)

Period of Scheme of Mining - 2012-13 to 2016-17

पर सख्या 314 (3)/ 2011

एम्प्ल/पीएमसीए 47

इस अनुमोदित किया पर

Appro: vide letter No

MCDR (CZ)/MP/KS/2007

एम (मध्य) एम्प्ल/  
Lessee

M/S SERAJUDDIN & CO

At PO : Joda

District - Keonjhar

State - Odisha

Ph - (06787) 27452/235720

K. Shankar.

(RQP/MAS/117/98/A)

27/04/2012

*Chauhan*  
27/4/12

खान नियंत्रक (महानिरीक्षण)

Controller of Mines (Central Zone)

भारतीय खान विभाग

Indian Bureau of Mines

Y. Nagendra  
RQP/BB/SK/04/2010/A)

&

Nihar Ranjan Nayak  
(RQP/CAL/291/2003/A)

48/23, Umapathy Street, West Mambalam, Chennai - 600 033  
Ph - 044- 24722185

For SERAJUDDIN & CO.

Jt. Managing Partner

# SERAJUDDIN & CO.

Mine Owners & Exporters

Head Office

10, NENTINE, CHENNAI

Branch Office

AT PO, JODA

KEONJHAR, ORISSA

Phone: 273452

Balda Block Iron Mines Office

AT PO, JODA

KEONJHAR, ORISSA

Ref. No.

Date

## CONSENT LETTER FROM APPLICANT

The Scheme of Mining under Rule 12 of MCDR, 1988 & Progressive Mine Closure Plan under Rule 23 B(2) of MCDR, 1988 of Balda Block Iron Mines, in Balda, Kalimali and Nayagarh in Keonjhar District, Orissa of M/s Serajuddin & Co over an extent of 335.594 ha have been prepared by Sri K.Shankar, Shri Y.Nagendra and Shri Nihar Ranjan Nayak the Qualified Recognized Persons under Rule 22 C of MCR 1960. I request the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar, Orissa to make further correspondence regarding Scheme of Mining and PMCP in the following address.

<p><b>Shri K.Shankar</b>                      Regd No RQP / MAS/117/98/A                      Valid till 16.04.2020                      New No - 49, Old No - 23.                      Umapathy Street                      West Mambalam                      Chennai - 600 033                      - 044- 24722195, 9444119195                      E-mail: shankar_k@redmine.com</p>	<p><b>Shri Y.Nagendra</b>                      Regd No RQP /BBSR/094/2010-A                      Valid till 05.05.2020                      Thirvani Consultancy Services                      Bonakala                      Joda-758034                      Dist Keonjhar, Orissa                      Phone: 09437072848                      nagendra_y_@redmine.com</p>	<p><b>Shri Nihar Ranjan Nayak</b>                      Regd No RQP/CAL/291/2003/A                      Valid till 09-11-2013                      Balda Block Iron Mine                      M/s Serajuddin &amp; Co                      At / Po -Joda                      Dist Keonjhar, Orissa                      Phone: 273452                      nihar_ranjana@redmine.com</p>
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अनुमोदित

APPROVED

We hereby undertake that the Scheme of Mining and PMCP prepared by the RQP shall be deemed to have been made with our knowledge and consent and shall be acceptable to us and binding on us in all respect. All the measures proposed in this PMCP will be implemented in a time bound manner as proposed.

For SERAJUDDIN & CO.  
 Date: 27.3.2012  
 Jt. Managing Partner

*Nayan*  
 Jt. Managing Partner

M/s Serajuddin & Co  
 For Serajuddin & Co.

*[Signature]*  
 Jt. Managing Partner

# SERAJUDDIN & CO.

Mine Owners & Exporters

Head Office

P 16, BENTINK STREET  
KOLKATA-1

Branch Office

AT/PO. JODA  
DIST-KEONJHAR, ORISSA  
Phone-273452

Balida Block Iron Mines Office

P.O. SA, DA  
DIST. KEONJHAR, ORISSA

Ref. No. ....

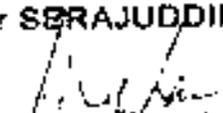
Date .....

## UNDERTAKING TO COMPLETE THE EXPLORATION (DRILLING) PROPOSED BELOW THE PIT BOTTOM AND LATERAL EXTENSION IN A TIME BOUND MANNER

We undertake to complete the drill holes as proposed under chapter - 3 of the text in a time bound period during the proposed Scheme of Mining Period.

Date: 27.3.2012  
Place : Bhubaneswar

For SERAJUDDIN & CO.

  
Jt. Managing Partner  
Joint Managing Partner  
M/s Serajuddin & Co

For Serajuddin & Co.

  
Jt. Managing Partner

APPROVED

For SERAJUDDIN & CO.

  
Jt. Managing Partner

# SERAJUDDIN & CO.

Mine Owners & Exporters

**Head Office**  
P. 16, BENTINCK STREET  
KOLKATA-1

**Branch Office**  
AT/PO. JODA  
DIST-KONJHAR, ORISSA  
Phone-273452

**Bajda Black Iron Mines Office**  
PO-BALDA  
DIST-KONJHAR (ORISSA)

Ref. No. ....

Date .....

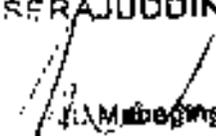
## UNDERTAKING REGARDING SUBMISSION OF GEO - REFERRED CADASTRAL MAP



We shall submit the geo-referred cadastral map of the mining lease area to Indian Bureau of Mines as soon as the necessary survey work is completed by the recognized agency of the State Government as stipulated by Indian Bureau of Mines in circular No 2 /2010 dated 06.04.2010

Date 27.3.2011  
Place : Bhubaneswar

For SERAJUDDIN & CO.

  
J. Managing Partner  
Joint Managing Partner  
M/s Serajuddin & Co

For Serajuddin & Co.

  
J. Managing Partner

For SERAJUDDIN & CO.  
  
J. Managing Partner

# SERAJUDDIN & CO.

Mine Owners & Exporters

Head Office

P 26, BENTINK STREET  
KOLKATA-1

Branch Office

AT/PO. JODA  
DIST-KEONJHAR, ORISSA  
Phone-273452

Balda Block Iron Mines Office

PO. BALDA  
DIST-KEONJHAR, ORISSA

Ref. No.....

Date.....

## CERTIFICATE-II

This is to certify that the Progressive Mine Closure Plan of Balda Block Iron Mines, in Balda, Kalimati and Nayagarh in Keonjhar District, Orissa of M/s Serajuddin & Co over an extent of 335.594 ha shall comply all statutory rules, regulations, orders made by the State or Central Government, Statutory Organisation, Court etc. wherever any specific permission is required, the lessee will approach the concerned authorities. The lessee also undertakes to the effect that all the measures proposed in this closure plan will be implemented in a time bound manner.

Date: 27.3.2011

Place: Bhubaneswar

- SERAJUDDIN & CO.

JL Managing Partner  
Joint Managing Partner  
M/s Serajuddin & Co

For Serajuddin & Co.

JL Managing Partner

For SERAJUDDIN & CO.

JL Managing Partner

# SERAJUDDIN & CO.

Mine Owners & Exporters

Head Office

# 16, BLANK STREET  
KOLKATA-1

Branch Office

AT/PO. JODA  
DIST-KEONJHAR, ORISSA  
Phone-273452

Balda Block Iron Mines Office

PO-BAIDA  
DIST-KEONJHAR (ORISSA)

Ref. No. ....

Date .....

## CERTIFICATE

Certified that the Scheme of Mining and Progressive Closure Plan in respect of Balda Block Iron Mines, in Balda, Kalimat and Nayagarh in Keonjhar District, Orissa of M/s Serajuddin & Co over an extent of 335.594, has been prepared in full consultation with us. I have understood the contents and agree to implement in accordance with law.

Date: 27.3.2012

Place: Bhubaneswar

JUDDIN & CO.

*[Signature]*  
Jt. Managing Partner  
M/s Serajuddin & Co

For Serajuddin & Co.

*[Signature]*  
Jt. Managing Partner

**APPROVED**

*[Signature]*  
Jt. Managing Partner  
M/s SERAJUDDIN & CO.

# SERAJUDDIN & CO.

Mine Owners & Exporters

Head Office

P 16, BENTINCK STREET  
KOLKATA-1

Branch Office

AT/PO. JODA  
DIST. KEONJHAR, ORISSA  
Phone-273452

Balda Block Iron Mines Office

PO. BALDA  
DIST. KEONJHAR, ORISSA

Ref. No. ....

Date .....



## CERTIFICATE - I

The provision of Mines Act, Rules and Regulations made there under have been observed in the preparation of the Scheme of Mining under Rule 12 of MCDR, 1988 along with PMCP under Rule 23B(2) of MCDR -1988 of Balda Block Iron Mines, in Balda, Kalimati and Nayagarh in Keonjhar District, Orissa of M/s Serajuddin & Co over an extent of 335.594 ha and wherever specific permission are required, the applicant will approach the D.G.M.S. Further, standards prescribed by D.G.M.S in respect of miner Health will be strictly implemented.

It is also certified that the information furnished in the Scheme of Mining is true & correct to the best of our knowledge

Date : 27.3.2012

Place - Bhubaneswar

APPROVED

SERAJUDDIN & CO.

Jt. Managing Partner  
Joint Managing Partner  
M/s Serajuddin & Co.

For Serajuddin & Co.

Jt. Managing Partner

For SERAJUDDIN & CO.

Jt. Managing Partner

**CERTIFICATE**

The Provisions of Mineral conservation and Development Rules, 1988 have been observed in the Scheme of Mining under Rule 12 of MCDR, 1988 and progressive Closure Plan under Rule 23B of MCDR, 1988 in respect of Balda Block Iron Mines, in Balda, Kalimati and Nayegam in Keonjhar District, Orissa of M/s Serajuddin & Co over an extent of 335.594., and wherever specific permissions are required, the applicant will approach the concerned authorities at Indian Bureau of Mines.

Date : 27-Mar-2012

Place: Bhubaneswar

*K. Shankar*  
K.Shankar

RQP/MAS/117/1998/A

*Y. Nagendra*  
Y.Nagendra

RQP/BBSR/084/2010/A

*Nihar Rajan Nayak*  
Nihar Rajan Nayak

RQP/CAL/291/2003/A

*Approved*  
**APPROVED**

For SERAJUDDIN & Co  
*[Signature]*  
Jt. Managing Partner

**CERTIFICATE - I**

The provision of Mines Act, Rules and Regulations made there under have been observed in the preparation of the Scheme of Mining under Rule 12 of MCDR, 1988 along with PMCP under Rule 23B(2) of MCDR -1988 of Balda Block Iron Mines, in Balda, Kalimati and Nayagarh in Keonjhar District, Orissa of M/s Serajuddin & Co over an extent of 335.594 ha and wherever specific permission are required, the applicant will approach the D.G.M.S. Further, standards prescribed by D.G.M.S In respect of miner Health, will be strictly implemented.

It is also certified that the information furnished in the Scheme of Mining is true & correct to the best of our knowledge

**Date : 27-Mar-2012**

**Place: Bhubaneswar**

*K. Shankar*

**K.Shankar**

**RQP/MAS/117/1998/A**

*Y. Nagendra*

**Y.Nagendra**

**RQP/BBSR/094/2010/A**

*Nihar Rajan Nayak*

**Nihar Rajan Nayak**

**RQPICAL/291/2003/A**

**STAMPED  
APPROVED**

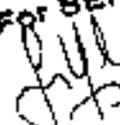
For SERAJUDDIN & CO.

*Jt. Managing Partner*

**Jt. Managing Partner**

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For SERAJUDDIN & CO.  
  
Jl. Managing Partner

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For SERAJUDDIN & CO.

  
J. Managing Partner

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For SERAJUDDIN & ...  
Jt. Managing Partner

**SCHEME OF MINING OF BALDA BLOCK IRON ORE MINE OF M/s SERAJUDDIN & CO  
IN BALDA, BADA KALIMATI AND NAYAGARH VILLAGES UNDER BAMEBARI P.S. OF  
KEONJHAR DISTRICT, ODISHA STATE OVER AN EXTENT OF 335.594 Ha.**

**Submitted under Rule 12 of MCDR - 1988**

**Introduction**

M/s. Serajuddin & Co, Joda, is operating a mining lease over an extent of 335.594 Ha for iron ore in villages Balda, Bada Kalimati and Nayagarh, under Bamebari P.S. of Keonjhar District, Odisha State.

- The mining lease was originally granted in the year 03.06.1962 up to 02.12.77.
- The same lease was 1<sup>st</sup> renewed for a period of 20 years from 03.12.1977 to 02.12.1997.
- Thereafter the lease was renewed 2<sup>nd</sup> time on 21.06.1999 for a period of 20 years over 335.594 ha from 03.12.1997, which expires on 02.12.2017. Refer lease deed enclosed vide Annexure - 1.
- The area is bounded by  
Latitude - 21° 51' 49.8" to 21° 53' 28.8" North  
Longitude - 85° 23' 40.8" to 85° 25' 04.8" East  
And located in the Topo sheet number - 73 G/5
- The mine is in continuous operations since 1962 by M/s Serajuddin & Co for iron ore mining to cater the raw material for domestic Iron & steel industries as well as for exports.

**Details of the area:**

- The total area of 335.594 Ha
- Out of the above mentioned area, 38.182 ha classified as Village Forest, and 297.706 ha as Non Forest (Govt. and Private). Annexure - 1A
- Further 219.951 ha are Forest kism recommended by District Level Committee (DLC) and balance 77.146 ha as Non - Forest.
- Out of 38.182 ha, approval for 24.446 ha of village forest under the F.C Act 1980 has been accorded by MOEF, GOI, New Delhi vide letter No 8-119/96-FC, dated 11.12.1998 as Stage II clearance. Refer Annexure - 2
- 117.949 ha area is declared broken up prior to 1980 out of which 1.618 ha of village forest land, 112.773 ha of DLC forest land & 3.558 ha of non-forest land. Refer Annexure - 2 A for working permission.
- The applicant has asked 111.985ha of broken up land and 92.373ha of virgin area to be diverted for non forest purpose for various Mining activities under forest conservation act excluding 15.613ha, of forest land earmarked for safety zone.

अनुमोदित  
**APPROVED**

*K. Shankar*

**K Shankar**  
RQP/MAS/117/2014

For SERAJUDDIN & CO.

*Nihar Ranjan Nayak*

**Nihar Ranjan Nayak**  
RQP/CAL/291/2003/A

0-1

Jt. Managing Partner

*Chandra*  
27/4/12  
खान नियंत्रक (अ.स.स.)  
Controller of Mines (A.S.S.)  
भारतीय खान नियंत्रक  
Indian Mines Controller  
RQP/MS/117/2014-A

**Details of Surface Rights**

- Office of the Collector and District Magistrate, Keonjhar has granted Surface Rights
  - o vide order No 1371 dated 05.07.1958 over an area of 27.09 hectares,
  - o vide order No 452 dated 18.02.1963 over an area of 90.82 hectares,
  - o vide order no 2076 dated 18.10.66 over an area of 76.10 hectares and
  - o vide order no 5090 dated 25.04.2008 over an area of 50.641 hectares
  - o Surface Rights for a total of 244.651 hectares is granted within lease hold area of 335.594 hectares for Balda Iron Mines under Champua Sub division of Keonjhar district in favour of M/s Serajuddin & Co. Refer Annexure - 2B
- Forest area, Non Forest area, Surface, right acquired area are demarcated on the Surface Plan. The next five years working will be carried out within the stipulated limits. The different areas mentioned above are marked on the Surface Plan.

**Details of Environmental clearances**

- The project has been accorded environmental clearance for a producing 1.482 MTPA vide its letter no.J-11015/319/2008-IA.II (M) on dtd.21.08.2007 from MoEF, Govt. of India (A copy is attached as Annexure - 3).
- Further the lessee has applied for expansion of iron ore production from 1.482 MTPA to 4.50 MTPA. The Environmental clearances for 4.50 MTPA from MOEF is approved in principle vide their Minutes of Meeting, which is uploaded in the website. (Annexure - 4)

**Details of Mining plan/Scheme of Mining approvals**

APPROVED

- The Mining Plan under Rule 11 of MCDR, 1988 was approved by Indian Bureau of Mines, Calcutta vide letter no. CAL/OS/KJ/FE/MP-183 dated 03.01.1992.
- The 1<sup>st</sup> Scheme of Mining under Rule 12 of MCDR, 1988 was approved by the Indian Bureau of Mines, Calcutta, vide letter no CAL/KJ/FE/MP-183 dated 08.08.1998.
- The 2<sup>nd</sup> Scheme of Mining was approved by Indian Bureau of Mines, Bhubaneswar vide letter No BBS/KJ/Fa/MS-95 on dated 11.06.2004.
- The modification of the 2<sup>nd</sup> Scheme of Mining has been approved for last two financial year 2005-06 to 2006-07 vide letter no BBS/KJ/Fa/MS-95 on dated 08.03.2006.
- Further Scheme of Mining for the period 2007-08 to 2011-12 was approved for a production of 4.50 MTPA vide letter No 314(3)/2008 -MCM/CZ/MS-22 dtd 04.02.2009. (Annexure- 5)

K. Shankar

K Shankar & Co  
RQP/MS/117/201ANihar Ranjan Nayak  
RQP/CAL/31/2003/A

0-2

Y Nagendra  
RQP/BBS/194/2011-A

Jt. Managing Partner

## Details of the other leases held by the Lessee

S.No	Lease Details	Name of the Village covered by the grant order	District	Extent (In Ha)	Mineral
1	Guruda Manganese ore mines	Guruda, Champua Sub Division	Keonjhar	40.06	Manganese

## Need of the project Expansion:

The current enhancement if from 4.50MTPA of ore to 15.15 Million tons of ROM. In fact to raise 4.50 MTPA of saleable iron ore during the earlier mining scheme period itself the ROM proposed to be produced is about 7.0 MTPA. Hence, the expansion is near about two times.

Out of the above mentioned 15.15 MTPA which is likely to be achieved in the fourth and fifth year of the plan period, 5.0 MTPA of ore will be supplied to nearby beneficiation Plants. M/a Serajuddin & Co is also planning to set up one pellet plant in its existing Kusum Power met (P) Ltd and the rest will be supplied to nearby sponge plants and steel industry. There seems to be an upswing in the demand for the iron ore as there are a no. of steel plants either in the process of being set up and many of the present plants considering for their capacity enhancement. There is also a no. of pelletisation plants coming up in the district of Keonjhar and also in the state for which we think we have a very justifiable forecast to enhance our production so as to be able to, supplement to the demands to be induced at that point of time. Keeping in view of the location, production capacity and reserves, we find ourselves competent enough to be able to supply the required ore to the above mentioned industries in the state as well as outside the state.

In view of the above mentioned reasons the expansion program of the mines is justified.

Further based on the recent exploration the reserves of the mines have considerably from 44.77Mil.T to 278.561Mil.T justifying the expansion proposal.

*K Shankar*

K Shankar  
RQP/MAS/117/96/A

*Nihar Ranjan Nayak*

Nihar Ranjan Nayak  
RQP/CAL/291/2003/A

*Y Nagendra*

Y Nagendra  
RQP/BBS/094/2010-A

For SERAJUDDIN & CO. 0-3

*Jt. Managing Partner*  
Jt. Managing Partner

# CHAPTER - 1

## REVIEW OF MINING SCHEME

For SERAJIDDIN & CO.

Jt. Managing Partner

**Chapter - I****PART I****1 REVIEW OF MINING SCHEME**

- 1.1 Name of Mine :** Balda Block Iron Mine  
Champua Sub division  
Dist. Keonjhar, Odisha State.
- 1.2 Particulars of approval of Mining plan (under MCR/MCDR) :** The Mining Plan was approved vide letter number CAL/CS/KJ/Fe/MP/183 for the period 1991 - 1996
- The 1<sup>st</sup> scheme of mining was approved vide letter CAL/KJ/Fe/MP/183 dated 08<sup>th</sup> June 1996
- The 2<sup>nd</sup> scheme of mining under Rule-12 of MCDR-1988 for the period of 2002-2007 was approved vide letter BBS/KJ/Fe/MS-95 dated 11.06.2004.
- The modification of the Mining Scheme under Rule 10 of MCDR, 1988 for the period of 2005-07 was approved vide letter BBS/KJ/Fe/MS-95 on dated 08.03.06.
- Further Scheme of Mining was modified for a production capacity of 4.50MTPA vide letter 314(3)/2008 - MCM/CZ/MS-22 dated 04.02.2009 for a period 2007 - 2012 (Refer Annexure -5)
- 1.3 Date of commencement of mining operation :** The mining lease was originally granted for manganese ore from 1.11.1946 to 1.11.51 and 3.12.1967 to 17.08.1974.
- The mining lease for Iron ore was executed within the said area for the period 03.06.62 to 02.12.77.
- The same lease was 1<sup>st</sup> renewed for a period of 20 years from 03.12.1977 to 02.12.1997.
- Thereafter the lease was renewed for 2<sup>nd</sup> time for a period of 20 years over 335.584 ha, from 03.12.1997 which expires on 02.12.2017.

*K Shankar*  
K Shankar  
RQP/MAS/117/98/A

*Nihar Ranjan Nayak*  
Nihar Ranjan Nayak  
RQP/CAL/201/2003/A

*Y Nagendra*  
Y Nagendra  
RQP/BBS/064/2018-A

For SEBAUDDIN & CO.

*Jl. Managing Partner*  
Jl. Managing Partner

1.4 (a) Deficiencies, if any, that existed in the approved mining plan to be taken note of and rectified by incorporating suitable proposals for implementation in the scheme of mining

The exploration was partially completed over a small portion of the mining lease. The reserves estimation done based on the available data of partial exploration has yielded less geological reserves.

Presently a detailed exploration has been carried out by drilling additional 122 holes for 9431.40m which has resulted in enhanced reserve quantity, which has paved way for the scientific and systematic mining as well as for the proposed expansion

Apart from the above there are no other deficiencies in the approved Mining Plan / Scheme. However all the salient points laid under the statute for preparation of the Scheme of Mining has been taken care.

b) Review of compliance position of salient features of mining scheme & justifications, if any

i) Exploration:

**Commitment:**

It was proposed to drill 75 nos of exploratory drill holes by core drilling during the scheme period of 2007-2012.

**Compliance:-**

As mentioned within modification of scheme of mines, 122 no of bore holes were drilled within the area. Copies of Form J – are enclosed vide Annexure – 6. The exploration has been carried out in a grid of 100 X 100m in the Non Forest and DLC Broken up area except in the DLC forest area which is applied for diversion under FC Act – 1980.

Year	No of Bore hole proposed	No of Bore hole completed
2007 - 08	Nil	Nil
2008 - 09	15	Nil
2009 - 10	20	Nil
2010 - 11	20	56
2011 - 12	20	66
Total	75	122

Note: The lessee has drilled 25 DTH holes in the year 2007-08 and the data of which is not available.

For SERAJUDDI & Associates  
 K Shankar  
 ROP/MAS/117/88/A  
 Jt. Managing Partner

Nihar Ranjan Nayak  
 ROP/CAL/291/2003/A

Y Nagendra  
 ROP/BBS/094/2010-A

**B) Mine Development (Overburden):****Commitment:**

Mining operation was proposed in the Block A, B, C, D, E & F besides small quantity was proposed to be produced from the dumps with a proposed maximum development of 1028112 Cu. m during the financial year of 2011-12. Development of pits was proposed laterally and as well as depth wise.

**Compliance:-**

Though it has been proposed to carry out mining in six blocks, the actual mining during the mining scheme period was pre-dominantly carried out in pit No - 1, 2, 5 & 4 which fall in Block A & Block - B respectively. The development achieved to meet the targeted production is mentioned below. Pits have been developed laterally as well as depth wise and over all pit slope angle has been kept at about 45°.

Year	Proposed (In Cu.m)	Actual (In Cu.m)	Actual (In Tons)
2007 - 08	886756	54545	120000
2008 - 09	840464	106364	234000
2009 - 10	1009654	98636	217000
2010 - 11	921400	284914	626810
2011-12(Feb-2011)	1028112	478989	1049376
<b>Total</b>	<b>4886376</b>	<b>1021448</b>	<b>2247166</b>

**Reason for deviation:**

Since the entire target production was not achieved the quantity of OB generated was less. However it is pertinent to mention that part of the quantity of Overburden generated is accounted as sub grade as the threshold of sub grade is now +45% Fe instead of earlier value of +55% Fe, vide circular of Indian Bureau of Mines No. K-11013/1/2008-CMG dated 27.02.2009. Hence the Overburden quantity is less.

**II) Exploitation (Iron ore production):**

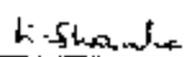
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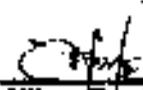
**Commitment:**

Mining operation was proposed in the Block A, B, C, D, E & F besides small quantity is produced from the dumps with a maximum production of 4051431 MT in the year 2011-12.

**Compliance:**

During the mining scheme period, production has been carried out in pit No - 1, 2, 5 & 4 which fall in Block - A & Block - B respectively. The production target and actual production during the mining scheme period are as tabulated below:

  
K Shankar  
RQP/MAS/117/982A

  
Nihar Ranjan Nayak  
RQP/CAL/291/2003A

  
Y Nagendra  
RQP/BBS/094/2018-A

For SERAJODIN & CO.

Jt. Managing Partner

Year	Proposed production in Tons	Actual Production in Tons
2007 - 08	1668158	1407601
2008 - 09	2475195	2324000
2009 - 10	2648110	1140792
2010 - 11	3371501	1478030
2011 - 12 (Till Feb -12)	4051431	1456477
<b>Total</b>	<b>14214395</b>	<b>7807700</b>

**Reason for deviation:**

The targeted production was not achieved as there was process delay in the Environmental clearance.

**ii) Waste Management (Dump Management):****Commitment:**

2 numbers of dumps were proposed for dumping within scheme period i.e. southeastern and western part of the lease area. Provision had been made to dump separately the total quantity of waste which constitutes laterite, murrum & shale to be generated within scheme period.

**Compliance:**

The total waste generated during the period of Scheme of Mining had been dumped in old dumps situated near Block A (Pit 1, 2 & 5) & Block B (Pit 4). The dumps proposed in the scheme of mining were not utilized as earmarked for dumping because the site proposed on the western side falls in the forest for which Forest clearance was not obtained. The dump on the south eastern side was not utilized as the mining was not carried out in the proposed Block F (Block F1). However the existing dumps were provided with retaining wall and garland drains.

**iv) Afforestation Program:****Commitment:**

As per the approved scheme of mining it has been proposed to cover an area of 11.68 hectares under afforestation programme.

**Compliance:-**

The plantation programme proposed and achieved during the previous scheme period is given below.

For SERAJUDDIN & CO.

Jt. Manager

*[Signature]*  
RQP/MAS/11/98/A

*[Signature]*  
Nihar Ranjan Nayak  
RQP/CA/09/2003/A

*[Signature]*  
Y Nagendra  
RQP/BBS/004/2010-A

Year	Proposed		Actual		
	Greenbelt / Avenue/ Dump Plantation		Greenbelt / Avenue / Dump Plantation (In Ha)		
	Area (Ha)	Saplings	Area (Ha)	Saplings	Location
1 <sup>st</sup> year 2007-2008	Nil	Nil	3.00	8500	Safety zone Plantation
2 <sup>nd</sup> year 2008-2009	2.05	5125	3.00	11000	Safety zone Plantation & gap filling plantation
3 <sup>rd</sup> year 2009-2010	2.05	5125	8.00	27500	Safety zone Plantation, gap filling plantation & Social forestry.
4 <sup>th</sup> year 2010-2011	3.87	9175	7.00	25000	Avenue plantation, Dump stabilization, gap filling plantation and Social forestry
5 <sup>th</sup> year 2011-2012	3.91	9775	4.00	10000	Avenue plantation, Dump stabilization, gap filling plantation & Social forestry
<b>Total</b>	<b>11.88</b>	<b>28290</b>	<b>25.00</b>	<b>82000</b>	

## v) Reclamation &amp; Rehabilitation:

Commitment: Not proposed

## vi) Control of Dust, noise and vibration:

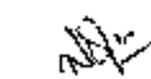
Commitment: Dust, Noise and vibration to be within the norms.

Compliance: The dust control and the noise, vibration control was carried out by:

- Scientific mining, good operational practices, good preventive maintenance schedules for mining equipments and green belt development all along the lease boundary to help reduce the generation of fugitive dust. The dust was suppressed in the mines haul roads by using atomizers fitted to water tankers and permanent water sprinklers installed along the haul roads.
- Planting of trees also confirm to the guidelines for noise abatement. Adequate noise abatement gadgets like acoustic cabins, silencers were installed in the HEMM to control the noise generation.
- To reduce the noise and vibration during blasting the explosive charges were initiated by shock tube initiation with down the hole initiation techniques. We use drill cuttings to cover the trunk line to control dust generation and noise. The blasting vibration studies have been carried out by a renowned scientific body Central Mining and Fuel Research Institute. The blasting activities were carried out as advised by the CMFRI recommendations and are monitored regularly by in-house team using Minimate seismograph.

  
K Shankar  
ROP/MA8/117/98/A

  
Nihar Ranjan Nayak  
ROP/CAL/2811/2003/A

  
Y Nagendra  
ROP/BS8/094/2010-A

For SERA MUDDIN & CO.

  
Jt. Managing Partner

- c) Review of the compliance position of conditions and stipulations imposed, if any, while approving the mining plan.

No conditions were imposed while approving the mining plan or scheme. Hence, no compliance is called for specifically.

- d) Review of compliance of violations pointed out after inspections made under MCDR, 1988 during last 5 years.

Violation of the provision of MCDR- 1988 in respect of the Balda Block Iron Mines was pointed out vide letter no – OR/IRON/KJR/MCDR-81/BBS, dated 01.09.2010, the copy of which is as follows

Rule	Violation	Compliance
13(1)	Mining operations not being carried out in accordance with the approved scheme of mining by not constructing garland drain and retaining wall to the extent proposed in the scheme of mining. i) Retaining wall & garland drain of 1600 m was proposed in the dumps for 2009-10 whereas 600 m construction was only made.	The retaining wall and garland drain has been constructed to a length of 1291.50 up to Mar2011. Further balance garland drain and retaining wall will be constructed during this year
Rule 21	Log books in respect of each HEMM used in the mine is not maintained in a bound page book	As per the advice the HEMM log book is being maintained.
Rule 23(E)	The yearly report of the protective and rehabilitative work as envisaged in PMCP under Rule 23E(2) is not carried out	The yearly report of PMCP under Rule 23E(2) for 2009-10 & 2010-11 is enclosed
Rule 29	Copies of plans & sections for the year 2009-10 not submitted till date	Updated Geological plan under Rule 29 of MCDR is enclosed
Rule 46	Appointment of Geologist has not been submitted in Form - I	Appointment of Geologist in Form - I is enclosed

Violations & compliance are attached as Annexure - 7 & 8

For SERAJUDDIN & Co.

Jt. Manager  
Shankar

K Shankar  
RQP/MA3/117/38/A

Nihar Ranjan Nayak  
RQP/CAL/211/2003/A

Y Nagendra  
RQP/BBS/094/2010-A

## CHAPTER - 2



### PROPOSAL UNDER SCHEME OF MINING FOR THE NEXT FIVE YEARS

अनुमोदित  
APPROVED

For SERAJUDDIN & CO.

Jt. Managing Partner

**2.0 PROPOSAL UNDER SCHEME OF MINING FOR THE NEXT FIVE YEARS.****2.1 Name and Address of the applicant:**

M/s Serajuddin &amp; Co.

At / Po-Joda

Dist-Keonjhar

Pin-758034

Phone-(06767) 273452

(06767) 235720, E Mail: seraj@serajuddinmines.com

The name and address of the partners of the company has been given below:

S.No	Name	Address
1.	Mr. Intekhab Alam, Managing partner	At/Po-Jhumpura, Ps-champua, Keonjhar
2.	Mohammad Mofazzalur Rahman, Joint Managing Partner	At/Po-Jhumpura, Ps-champua, Keonjhar
3.	Mrs. Hamida Khatun, Partner	38, circus Avenue, Kolkata - 700557
4.	Mohammed Saifuraz Alam Working partner	At/Po-Jhumpura, Ps-champua, Keonjhar
5.	Mr. Seroen Yazdani, Partner	At-N-4/136, IRC Village, Nayapalli, Bhubaneswer, Khurda
6.	Seraj Yusha, Joint Managing Partner	At-N-4/136, IRC Village, Nayapalli, Bhubaneswer, Khurda
7.	Meraj Yusha, Partner	At-N-4/136, IRC Village, Nayapalli, Bhubaneswer, Khurda

Copy of partnership deed by all partners nominating the authorized signatories as Joint Managing Partners having the power to negotiate with any agency relating to the affairs of the firm on behalf of the firm and all agreements / contracts executed by the firm shall be jointly signed as per Annexure 9A and 9B for Photo ID of Partners

**2.2 Name and address, registration no. Of the recognized qualified person who has prepared the mining scheme.**

**Shri K.Shankar**  
 Regd. No RQPMAS/117/09/A  
 Valid till 16.04.2020  
 New No - 49, Old No - 23,  
 Umapathy Street  
 West Mambalam  
 Chennai - 600 033  
 Phone 044- 24722195.  
 9444119196  
 E-mail - empres05@rediffmail.com

**Shri Y.Nagendra**  
 Regd. No RQP/BBS/094/2010-A  
 Valid till 05.06.2020  
 Thevenet Consultancy Services  
 Bonakala  
 Joda-758034  
 Dist Keonjhar, Orissa  
 Phone: 09437072848  
 nagendra\_y\_a@rediffmail.com

**Shri Nihar Ranjan Nayak**  
 Regd No RQPCAL/291/2003/A  
 Valid till 09-11-2013  
 Bakda Block Iron Mine  
 M/s Serajuddin & Co  
 At / Po Joda  
 Dist Keonjhar, Orissa  
 Phone: 273452  
 nihar\_nayak70@gmail.com

Refer Annexure - 8 for RQP certificates

FOR SERAJUDDIN &amp; CO.

**K Shankar**  
 RQPMAS/117/09/A

**Nihar Ranjan Nayak**  
 RQPCAL/291/2003/A

**Y Nagendra**  
 RQP/BBS/094/2010-A

**2.3 Mineral(s) to be mined**

The lessee will be mining iron ore within the lease area.

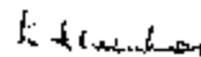
**2.4 Area and date of expiry of lease.**

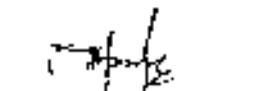
Extent of the ML area	:	Total Mining lease area 335.594ha.
Revenue village	:	Area comes in revenue village of Balda, Bada Kalimat and Nayagarh of Champua Sub division Keonjhar District Odisha State
Date of expiry of lease	:	The lease was renewed 2nd time for a period of 20 years from 03.12.1997, which expires on 02.12.2017.

**2.5 Date of expiry of 5 year period for which the mining scheme is prepared:**

- The mining plan was approved under rule 11 of MCDR, 1988 for the period of 1992-1997 vide letter CAL/DS/KJ/FE/MP/183 dated the 03-01-1992.
- The first scheme of mining for the period of 1997-2002 was approved vide letter CAL/KJ/FE/MP - 183 dated 08.08.1998.
- The 2<sup>nd</sup> scheme of mining for the period of 2002-2007 was approved vide letter No.BBS/KJ/Fa/MS-95 on dated 11.08.2004. The modification of the mining scheme for period of 2005-07 was approved vide letter no BBS/KJ/Fa/MS-95 on dated 08.03.2006.
- Further scheme of mining was approved for a production capacity of 4.50MTPA vides letter No 314(3)/2008 and MCM/CZ/MS-22 dated 04.02.2009.

APPROVED

  
K Shankar  
RQP/MS/117/90/A

  
Nihar Ranjan Nayak  
RQP/CAL/2811/2012/A

  
Y Nagendra  
RQP/BBS/094/2010-A

For SERAJUDIN & CO2

  
Jt. Managing Partner

# CHAPTER - 3



## RESERVES & EXPLORATION

सम्वैदित  
APPROVED

For SERAJUDDIN & CO.  
Managing Partner

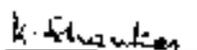
**Chapter - III****3.0 GEOLOGY & RESERVE****Physiography (Topography):**

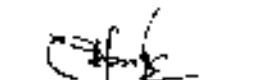
The topography is a hilly terrain in the lease hold and elevation varies from 528 m to 672m above MSL.

The area exhibits dendritic drainage pattern with several small seasonal nullas and streams joining nearby tanks located adjoining to the lease area. Bethajari Nallah is the only nallah which is flowing along the eastern boundary of the mining lease which will not be affected by the mining operation. Few seasonal streams flow through the lease. However the measures will be taken to ensure that the surface water quality is not affected due to the mining operations by constructing necessary guard walls, check dams, etc. Surface run off of the mines will be directed to the settling ponds.

**Regional Geology:**

The Balda Block Iron Mine located in village (s) - Balda, Bada Kalimati & Nayagarh under Bamebari P.S. of Keonjhar District, Odisha State forms a part of pre-Cambrian Iron Ore series, under Iron Ore Group of Upper Dhanwar age, in Singhbhum-Keonjhar-Bonai area. The general strike of deposit is E-W, which gradually swings to NW-SE towards further east near Mayurbhanj. The iron ore series consists mainly of banded hematite quartzites or jasper and shale with intercalations of phyllites and tuffs. The iron-ore series are overlain by rocks of Kallhan series consisting of sandstones, Iron Ores and shale, considered to be of Cuddapah age.

  
K Shankar  
RQP/MS/117/03/A

  
Nihar Ranjan Nayak  
RQPICAL/20/2003/A

  
Y Nagendra  
RQP/BS/094/2010-A

For SERAJUDDIN & CO. 3-1

  
Jt. Managing Partner

## Regional stratigraphic sequences in the area

I R O N O R E S U P E R G R O U P	Kolhan Group	Amphibolites and Epidiorite Chlorite schist, Garnetiferous mica schist Sandstone quartzite Carbonaceous phyllites & slates Conglomerate quartzite & slate
	----- Unconformity -----	
I R O N O R E G R O U P	Iron Ore group (Variegated shales)	Variegated shales, phyllites, mica-schists, quartzites, Garnetiferous mica-schists, black carbon phyllites, chlorite phyllites and quartzites. Quartzites, BHQ/BHJ Cherts, Limonites, Ferruginous Shales
	Iron Ore Group (Noamundi Group)	Carbonaceous Phyllites & Mica-schist, Micaceous quartzites, banded black and green cherts.

## Geology of the Area

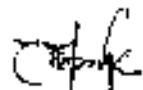
Geologically the area is represented by a variety of rocks belonging to Iron Ore Super Group of Archean age which include older metamorphics, meta-sedimentaries and intrusives. Ferruginous and manganese laterites occur as capping and discontinuous patches over these formations. Recent alluvium occurs in very narrow patches along nala etc. The general strike of the area is NS and the dip ranges from 20 to 45°, generally dipping easterly.

## Geology of the Leasehold:

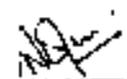
The occurrence of iron forms a part of pre-Cambrian sedimentary formation known as the iron ore series developed in Singhbhum – Keonjhar – Borsai area. The lithology succession is as follows:

The lease hold area exposes different litho units comprising of banded iron formations with iron ores, ferruginous shale which are commonly found to have been intensely lateritized. The disposition of these litho units with the associated structural features, as Soil & Alluvium, Ferruginous Laterite, Float iron ore, Hard & Soft Laminated iron ore of Precambrian age, In-situ massive iron ore, Friable ore, banded iron formations and Shale.

For SERAJUDDIN & CO.  
K Shankar  
RORANKA  
Sr. Managing



Nihar Ranjan Nayak  
RORANKA  
3-2



Y Nagendra  
RORANKA  
RORANKA/08/2010-A

## 3.1 Category wise reserves estimated in the earlier mining scheme with grade.

Category	Geological reserve of In-situ ore in MT	Geological reserve of Float ore in MT	Total Geological reserve in MT	Mineable reserve of In-situ ore in MT	Mineable reserve of Float ore in MT	Total Mineable reserve in MT
Reserve Proved	13,768,080	2,425,080	16,211,168	11,326,980	1,496,600	12,823,580
Probable	13,891,500	2,723,000	16,614,500	12,802,020	2,314,200	15,116,220
Total Resources	27,677,580	5,148,080	32,825,660	24,129,000	3,810,800	27,939,800
Possible	12,883,160	6,332,067	19,015,227	11,404,050	6,433,704	16,837,754
G.Total	40,380,740	11,480,147	51,840,887	35,533,050	9,244,504	44,777,554

Reserve has been calculated by standard cross - sectional method. Sectional areas have been calculated on the section lines. Sectional areas calculated have been multiplied with influence width of the section line concerned to get the volumetric reserve (in Cu.m.). This volumetric reserve has been multiplied with the recovery factor of ore and the tonnage - factor (MT/Cu.m.) to get the geological reserves.

## 3.2 Depletion of reserves:

During the mining scheme period 7.807 MLT has been produced from the lease as follows.

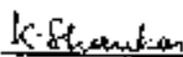
## Production from the mines:

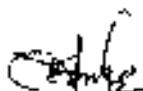
Year	Production (Tons)
2007-08	1407501
2008-09	2324000
2009-10	1140792
2010-11	1478930
2011-12 (Till Feb 2012)	1456477
Total	7807700

Mineable reserve as per mining scheme = 4,47,77,554 Tons  
 Production up to Feb 2012 = 78,07,700 Tons  
 Present mineable reserve as on 30.09.2011 = 3,69,69,854 Tons (36.96 Million MT)

## 3.3 Additional reserves estimated (category wise)

During the approved mining scheme period exploration has been carried out by drilling 122 number of core bore holes for a total meterage of 9431.40 m. In addition to the new exploration drill holes, the 28 old bore holes with total meterage of 1202.05 m is also considered for reserve estimation. Details of bore holes drilled are given under paragraph 3.4.8.

  
 K Shankar  
 ROP/MAS/117/98/A

  
 Nihar Ranjan Nayak  
 ROP/CAJ/29/2003/A

  
 Y Nagendra  
 ROP/BBS/094/2010-A

3-3  
 For SERAJUDDIN & CO.

  
 Jt. Managing Partner

### 3.4 Category wise updated reserve with grade:

Detailed exploration has been carried out which categorizes the status as per G1 Norms. The salient features of the detailed exploration carried out by the lease are given below.

- Detailed topographic survey of the entire area was carried out depicting all surface features, like road, existing workings, HT line, Crusher /screen locations, buildings, weighbridge, magazine etc.
- As per CCOM circular No - 2 Geo-reference of mining lease map is already carried out and the final map is enclosed showing the lease boundary from DGPS superimposed on high resolution satellite imagery covering 500 m buffer from the M.L area.
- Geological mapping was carried out for the entire area in 1:2000 scale, depicting all geological features, bore holes drilled, strike and dip of the deposit etc.
- Detailed grid pattern has been laid and bore holes are drilled at every 100' \* 100m interval. In total about 150 bore holes (122 new + 28 old) were drilled in the entire lease area.
- Sampling of the ore produced from the mines is carried out regular. Lab facility is available at the mines itself.
- 30 cross section were drawn based on the bore hole analysis data and the reserves have been estimated based on the threshold limit suggested by ISM.

#### 3.4.1 Basis of Estimation:

The area is evaluated on the basis of surface geological mapping, working pits and bore hole data. Reserve estimate is done by cross-sectional area method (Ref Geological Plan and Geological Cross section Plate No.4 & 5). The norms or basis for calculating the reserve are as follows:-

1. Measured mineral resource is based on the bore hole spacing. If the holes are with a spacing of 100 X 100 m the reserves falling within such limits are considered as measured resources (331). The maximum depth of the ore in the bore holes is considered as reserve estimation limit. The same has been depicted in the cross sections.
2. Areas where the bore holes are at wider interval beyond 100 m, the reserves are categorized as indicated mineral resource (332).
3. Tonnage Conversion factor for hard ore - 3.5 Tons/Cu. m.
4. For sub grade ore the Tonnage Conversion factor is assumed as 2.8 Tons/Cu. m and for OB / waste it is assumed as 2.2 Tons/Cu. m.
5. Consideration of safety zones and safety measures.
  - (i) 50m safety zone on both sides along H.T. electric line passing through the area
  - (ii) 7.5 m zone around the M.L. boundary.
  - (iii) 50 m along express highway on both sides.
  - (iv) 50 m along perennial nalah on both sides.

K. Shankar  
K Shankar  
ROP/MAS/117/2018-A

Nihar Ranjan Nayak  
ROP/CAL/2017/2008-A

Y Nagendra  
ROP/BB/004/2018-A

6. Resources: Reserves estimate is evaluated without considering the safety zone parameters and other non mineable parameters.
7. Mineable Reserves: Reserves estimated after deducting the blocked reserves in Safety Zone and other non mineable areas is considered as mineable reserves after feasibility study.
8. Besides the external sub grade dumps will add to the quantity of Mineral Resources as stocks

#### 3.4.2 Reserves:

Mineralized zone has been demarcated /identified as per the surface exposure, existing pit and bore hole data. The drilling program has been prepared and the exploratory core drill holes were drilled as below:

S.No	Block ID	Area (Ha)	New Boreholes	Old Boreholes	Avg Thickness of Orebody (m)	Grade Fe%	No. of Core Samples Analyzed	No. of Pits	Remarks
1	Block-A DLC Broken G1	71.817	52	10	45 - 60.5	61.56	23/33B	1	Pit 1 and Pit 2
2	Block-B DLC Broken G1	19.337	18	1	82 - 85.3	63.80	1/1	1	Pit 3
3	Block-C DLC Broken G1	0.528	-	-	-	-	-	-	-
4	Block-D DLC Broken G1	9.532	2	-	28 - 32	60.63	11/8	-	Pit 4
5	Block-E DLC Broken G1	6.853	4	1	38 - 61.75	64.21	32/28	1	Pit 5
6	Block-F, G & H DLC Broken G1	4.908	-	-	-	-	-	1	Pit 6
7	Block-I VF Broken G1	1.818	2	-	55 - 76.5	63.28	14/14	1	Kalmat Pit
8	Non Forest Broken G1	3.558	2	-	43.0	61.04	11/8	-	Pit 7
9	Block-VF Virgin G1	22.828	14	2	48 - 66.4	62.41	123/115	-	Offshore area
10	Non Forest Virgin G1	55.048	22	7	35.7	59.93	163/140	-	-
11	DLC Forest Virgin	91.665	-	8	10.10	45.10	13/11	-	-
12	DLC Forest - S/Z area	15.613	-	1	Waste	Waste	3/0	-	Safety zone area
13	Village Forest Land - S/Z area	13.738	-	-	-	-	-	-	Safety zone area
14	Non Forest Land - S/Z area	18.957	6	-	19.0	53.43	27/21	-	Safety zone area
15	Total Area	338.694	122	28	-	-	-	-	Safety zone area

The drilling is carried out in 100 m X 100 m grid interval. The density of drilling comes out to be 1.4 numbers per hectare.

The adjacent area further projected on either side of G1 limit for about 50 to 75 m with one to two bore holes in the proximity is taken as G2 area.

Accordingly measured and indicated resources have been estimated and the details are as below:

Geological reserves in Million MT	Ore +SB % Fe	SG +45 - 58 % Fe	Total
Measured (331)	221.862	34.223	256.085
Indicated (332)	52.624	12.647	65.270
Total	274.486	46.870	321.356

The reserve estimation includes the cross sectional area multiplied with length of influence of respective section, Tonnage conversion factor and ore incidence factor/Recovery factor to compute the quantum of geological reserve.

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Symbolic representation outlined to calculate the reserve is as below.

$$G = CLTI$$

Where	G	=	Geological reserve in metric tons
	C	=	Average Cross sectional area in square metres
	L	=	Length of influence in metres
	T	=	Tonnage Conversion factor
	I	=	Ore incidence factor

The details of the reserves estimation is in the following pages.

### 3.4.3 Mineable Reserves:

The Feasibility Study has been conducted over measured and indicated resources with the consideration of the modification factors. As can be seen from Geological sections certain quantity of iron ore will be blocked due to overall pit slope of 37.5°, 50 m safety zone on either side along H.T. electric line passing through the area, 7.5m zone along the M.L. boundary, 50m along express highway on either side and 50m along perennial nalah on both sides. This has been demonstrated in the Feasibility Study (F1) Annexure - 11.

The estimation of mineable reserve has been done by excluding reserve under safety zones from the geological reserve. The thickness of iron ore of the area is in accordance with the borehole data and existing pit.

The detail of the mineable and the non-mineable reserves is as below:

Mineable Proved UNFC Code 111	Qty MT	Non Mineable Proved UNFC Code 211	Qty MT
Diverted Forest	167.732	Road Safety Zone	0.718
Non Forest	24.015	UPL	21.222
Broken Up area	40.233	Lease Pillar Safety Zone	1.050
Un-diverted Forest	1.213		
Mineable Probable UNFC Code 122		Non Mineable Pre-feasibility Resource UNFC code 222	
Diverted Forest	33.209	Road Safety Zone	2.287
Non Forest	4.115	UPL	16.011
Broken Up area	2.736	Lease Pillar Safety Zone	1.607
Un-diverted Forest	5.308		

The block wise mineable reserves are as below:

Block ID	UNFC Code 111	UNFC Code 122
BLOCK A	101.494	15.722
BLOCK B	56.405	12.086
BLOCK F1	52.599	9.897
BLOCK E	14.403	4.167
BLOCK F	8.292	3.501
GRAND TOTAL	233.193	45.368

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The reserves are calculated and summary is as below:

Mineable Reserves in Million MT	UNFC Code	Ore	SG	Total
Mineable Proved	111	201.136	32.057	233.193
Mineable Probable	122	35.413	9.955	45.368
Non Mineable Feasibility resource	211	20.724	2.166	22.890
Non Mineable Prefeasibility resource	222	17.217	2.688	19.905
Total		274.490	46.866	321.356

#### 3.4.4 Exploration Proposal:

##### Already Carried Out:

In order to authenticate the depth continuity of ore zone the lessee has drilled 28 nos of core drilling in the year of 2005-07. The maximum depth of penetration was 65 m and the minimum depth being 11 m.

Subsequently during the year 2010-11 and 2011-12 the lessee has drilled 122 core bore holes for a total meter age of 9431.40 m to augment the ore reserves within the lease area into proved category. Details of old bore holes and new bore holes are furnished in the bore hole log data as per Annexure- 10. The details of the old bore holes and the new bore holes drilled during the 2010-11 & 2011-12 is listed below in separate tables. Abstract of the Bore holes drilled based on which revised reserves are calculated is enclosed vide Annexure - 10A. Exploration report is given Vide Annexure - 10B

The resource summary is as below:

Reserves / Resource MT	Type	UNFC Code	Qty MT
Reserves A	Proved	111	233.193
	Probable	122	45.368
	Sub Total		278.561
Remaining Resource B	Feasible Measured resource	211	22.890
	Prefeasibility Measured resource	222	19.905
	Measured Minerals	331	
	Indicated Minerals	332	
	Inferred Minerals	333	
	Sub Total		42.795
	Total A + B		321.356

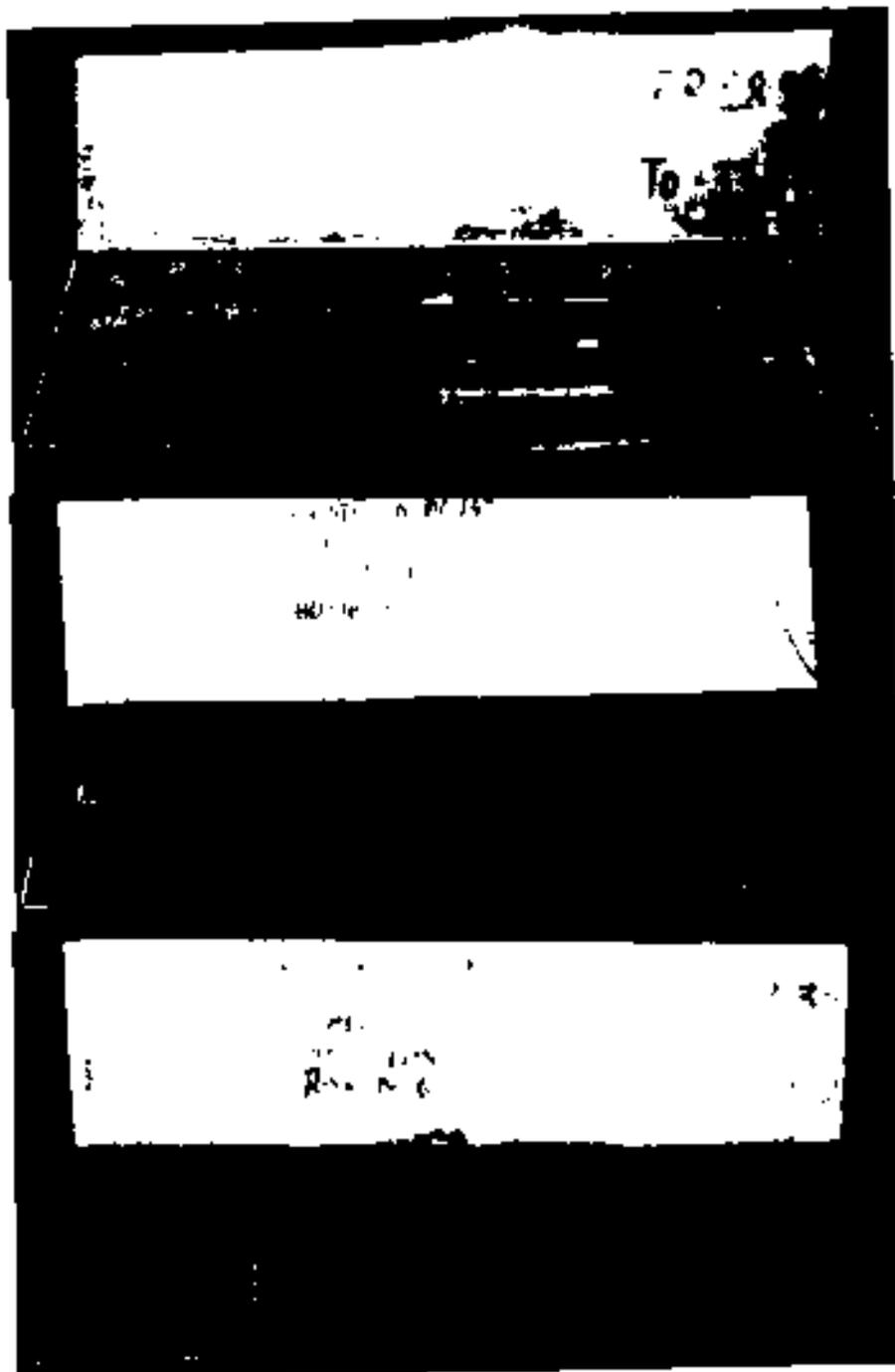
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Sample core photos

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**Details of Bore holes drilled in 2010-11 & 2011-12**

S.N.	BH ID	NORTHING	EASTING	RL (mtr)	Depth	TYPE
1	SBH-7/2	2420949.930	335081.020	600.804	104.10	CORE
2	SBH-7/3	2420968.882	335286.448	587.626	53.10	CORE
3	SBH-9/3	2420754.192	335376.086	604.663	35.10	CORE
4	SBH-11/3	2420542.067	335146.435	624.434	28.50	CORE
5	SBH-10/1	2420652.386	335156.001	609.892	88.10	CORE
6	SBH-11/2	2420564.168	334965.687	628.591	110.10	CORE
7	SBH-11/1	2420547.610	334880.000	631.865	89.00	CORE
8	SBH-7/1	2420949.143	334678.530	648.555	58.00	CORE
9	SBH-5/1	2421152.993	334880.006	608.587	77.00	CORE
10	SBH-3/2	2421352.993	334830.006	623.129	65.50	CORE
11	SBH-5/2	2421149.883	335055.004	596.155	86.00	CORE
12	SBH-9/1	2420750.841	334808.269	635.650	101.50	CORE
13	SBH-4/1	2421250.403	334791.700	630.614	64.50	CORE
14	SBH-3/1	2421349.771	334977.386	566.043	74.30	CORE
15	SBH-20/9	2419588.146	336087.563	556.583	17.40	CORE
16	SBH-21/10	2419498.146	336083.718	554.153	44.10	CORE
17	SBH-20/8	2419577.342	335987.052	554.738	17.30	CORE
18	SBH-21/9	2419464.460	335906.048	550.918	50.10	CORE
19	SBH-19/4	2419649.194	335817.100	555.954	67.40	CORE
20	SBH-23/4	2419351.617	335947.679	551.565	74.00	CORE
21	SBH-25/2	2419155.976	335617.785	551.878	31.00	CORE
22	SBH-24/3	2419252.305	335644.948	552.642	57.20	CORE
23	SBH-25/4	2419153.230	335963.881	583.328	83.60	CORE
24	SBH-27/2	2418950.990	335767.556	586.056	68.80	CORE
25	SBH-26/5	2419055.910	335781.470	573.598	80.00	CORE
26	SBH-17/2	2419950.798	335175.259	576.375	125.00	CORE
27	SBH-15/2	2420158.083	335012.868	611.168	119.30	CORE
28	SBH-15/3	2420121.395	335172.685	590.856	97.10	CORE
29	SBH-9/2	2420750.312	334975.044	617.684	71.00	CORE
30	SBH-19/2	2419750.089	335375.437	573.442	119.50	CORE
31	SBH-17/3	2419944.256	335378.929	576.881	72.50	CORE
32	SBH-9/6	2420752.985	335179.992	570.111	64.00	CORE
33	SBH-23/1	2419357.326	335362.425	566.421	56.50	CORE
34	SBH-17/1	2419952.995	334980.010	584.135	76.80	CORE
35	SBH-7/4	2420970.709	334879.884	604.103	95.00	CORE
36	SBH-21/1	2419525.522	335191.100	587.007	91.80	CORE
37	SBH-19/1	2419728.696	335169.346	596.002	95.80	CORE
38	SBH-3/3	2421356.202	335066.051	576.645	105.20	CORE
39	SBH-11/14	2420553.799	335681.734	549.966	62.80	CORE
40	SBH-4/2	2421242.673	334994.016	585.430	90.50	CORE
41	SBH-11/8	2420551.878	335978.667	547.343	26.10	CORE

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S.No.	BH ID	NORTHING	EASTING	RL (mtr)	Depth	TYPE
42	SBH-13/6	2420364.175	335760.901	549.376	44.30	CORE
43	SBH-6/1	2421057.323	334975.268	604.803	52.30	CORE
44	SBH-13/7	2420338.506	335965.974	552.766	48.30	CORE
45	SBH-6/3	2421045.392	335177.818	594.432	75.20	CORE
46	SBH-13/8	2420346.015	336140.407	571.185	30.10	CORE
47	SBH-14/10	2420244.864	336086.340	575.685	87.80	CORE
48	SBH-8/3	2420849.689	334983.283	618.722	106.00	CORE
49	SBH-14/11	2420247.861	336176.447	575.525	29.70	CORE
50	SBH-12/11	2420451.792	335878.162	545.935	36.60	CORE
51	SBH-10/3	2420654.962	334888.654	624.679	75.00	CORE
52	SBH-15/9	2420151.120	336978.000	563.000	162.50	CORE
53	SBH-10/8	2420651.114	335380.337	589.517	14.00	CORE
54	SBH-16/13	2420050.513	336304.674	558.953	141.00	CORE
55	SBH-12/4	2420453.103	335077.199	627.431	32.50	CORE
56	SBH-16/4	2420052.735	335296.830	583.236	84.20	CORE
57	SBH-12/1	2420446.556	334770.057	655.405	26.30	CORE
58	SBH-11/11	2420545.747	335075.389	621.188	23.00	CORE
59	SBH-10/4	2420652.958	334987.433	609.444	83.00	CORE
60	SBH-16/2	2420058.402	335068.794	597.925	122.20	CORE
61	SBH-13/9	2420356.134	336291.837	543.261	34.10	CORE
62	SBH-9/10	2420749.944	335082.227	601.322	90.70	CORE
63	SBH-18/2	2419856.857	335165.021	574.422	118.60	CORE
64	SBH-12/9	2420451.667	335679.748	550.613	77.10	CORE
65	SBH-10/7	2420649.589	335292.575	613.677	23.50	CORE
66	SBH-18/1	2419846.980	335084.990	580.000	85.50	CORE
67	SBH-11/7	2420562.985	335763.780	574.080	60.80	CORE
68	SBH-16/7	2420084.418	335572.277	558.912	74.20	CORE
69	SBH-18/3	2419854.507	335364.270	573.189	113.20	CORE
70	SBH-15/12	2420149.880	335282.338	597.345	94.80	CORE
71	SBH-24/7	2419283.042	335967.840	568.919	152.00	CORE
72	SBH-24/6	2419252.993	335880.006	565.650	36.30	CORE
73	SBH-16/3	2420067.990	335183.980	585.000	90.10	CORE
74	SBH-14/8	2420250.428	335784.420	550.798	66.10	CORE
75	SBH-16/1	2420079.000	334988.000	597.000	116.10	CORE
76	SBH-13/15	2420349.164	335887.229	548.700	42.00	CORE
77	SBH-15/8	2420149.205	336181.852	581.355	87.10	CORE
78	SBH-10/2	2420652.003	334807.006	640.000	86.10	CORE
79	SBH-16/12	2420053.142	336180.381	584.217	83.50	CORE
80	SBH-15/7	2420158.091	335975.156	580.043	89.10	CORE
81	SBH-16/11	2420057.882	335979.390	584.403	83.10	CORE
82	SBH-17/13	2419953.046	336077.595	591.283	87.70	CORE

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S.No.	BH ID	NORTHING	EASTING	RL (mtr)	Depth	TYPE
83	SBH-17/6	2419957.574	335984.279	587.924	38.10	CORE
84	SBH-17/7	2419951.527	336177.070	586.698	81.10	CORE
85	SBH-18/10	2419852.989	336178.044	582.374	73.30	CORE
86	SBH-18/9	2419851.554	335974.469	583.354	77.10	CORE
87	SBH-19/11	2419744.817	336072.934	581.890	87.80	CORE
88	SBH-15/16	2420152.418	336059.443	583.159	91.10	CORE
89	SBH-19/6	2419761.036	336185.397	570.425	101.10	CORE
90	SBH-18/11	2419843.924	336290.168	571.953	83.40	CORE
91	SBH-8/7	2420873.990	335373.980	596.980	50.00	CORE
92	SBH-7/8	2420949.057	335182.717	588.562	76.00	CORE
93	SBH-8/6	2420856.619	335281.268	586.317	71.00	CORE
94	SBH-8/5	2420849.889	335180.634	561.441	76.00	CORE
95	SBH-9/11	2420752.560	335279.572	575.488	66.00	CORE
96	SBH-5/4	2421149.803	334954.206	590.272	110.00	CORE
97	SBH-6/2	2421049.393	335097.336	598.597	95.00	CORE
98	SBH-6/4	2421053.665	335280.163	593.252	61.00	CORE
99	SBH-5/5	2421141.542	335183.426	606.889	85.00	CORE
100	SBH-8/4	2420849.899	335074.677	592.204	92.00	CORE
101	SBH-7/6	2420951.333	334589.372	653.153	89.00	CORE
102	SBH-8/1	2420842.910	334583.978	660.048	67.00	CORE
103	SBH-12/2	2420475.078	334878.182	647.309	84.00	CORE
104	SBH-12/3	2420454.537	334974.836	645.043	104.00	CORE
105	SBH-11/10	2420552.600	334832.520	635.936	91.00	CORE
106	SBH-17/8	2419951.134	335087.775	573.866	86.00	CORE
107	SBH-24/1	2419239.607	335375.300	570.517	104.00	CORE
108	SBH-22/2	2419453.764	335381.950	586.634	98.00	CORE
109	SBH-21/6	2419563.676	335280.548	591.202	110.00	CORE
110	SBH-18/4	2419849.569	335465.347	565.174	67.00	CORE
111	SBH-19/7	2419769.581	335284.279	580.930	104.00	CORE
112	SBH-27/5	2418946.602	335863.975	597.682	68.00	CORE
113	SBH-26/4	2419052.985	335880.001	592.498	86.00	CORE
114	SBH-25/7	2419152.983	335879.991	585.545	68.00	CORE
115	SBH-7/7	2420948.980	334980.910	613.203	151.40	CORE
116	SBH-10/9	2420652.830	335080.040	594.430	103.10	CORE
117	SBH-9/7	2420753.030	334679.710	653.520	83.90	CORE
118	SBH-3/4	2421352.980	335179.820	567.003	81.00	CORE
119	SBH-12/12	2420458.952	335958.848	547.941	61.20	CORE
120	SBH-6/7	2421052.950	334879.930	605.250	78.50	CORE
121	SBH-9/9	2420745.310	334886.740	630.416	96.00	CORE
122	SBH-6/6	2421052.000	334783.500	630.709	80.00	CORE
<b>TOTAL</b>					<b>9431.40</b>	

APPROVED

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3.4.5 Future Exploration Programme:

Further the areas applied for DRP needs detailed exploration. Based on the geological mapping most part of the area has been delineated to be a mineralized zone. It is envisaged to concentrate the additional exploration activities in this zone. 41 nos of bore holes are proposed to be drilled during the first year (2012-13) of the scheme period to convert the entire reserves into proved category as per UNFC guidelines. Core drilling is suggested at 100m X 100m grid interval. The Average anticipated depth of each hole will be 70 m. However all the bore holes will be drilled to the end of the ore zone. The quantum of year wise exploration to be carried out is tabulated below.

Details of proposed bore holes

S.No.	YEAR	PBH NO	COORDINATES	Remarks	
1	2012-13	PBH-01	335480E - 2421153N	1) Each hole is proposed to be drilled to depth up to the bottom of the ore body to prove the existence of the ore. However assuming an average depth of 70m about 2660 m of core drilling is anticipated.	
2		PBH-02	335480E - 2421053N		
3		PBH-03	335480E - 2420953N		
4		PBH-04	335580E - 2420953N		
5		PBH-05	334380E - 2420753N		
6		PBH-06	334580E - 2420753N		
7		PBH-07	334580E - 2420653N		
8		PBH-08	334680E - 2420653N		
9		PBH-09	334680E - 2420553N		2) Drilling in the DTC forest area is subject to obtaining permission from the forest department
10		PBH-10	334880E - 2420353N		
11		PBH-11	334980E - 2420353N		
12		PBH-12	335080E - 2420353N		
13		PBH-13	335380E - 2420353N		
14		PBH-14	334880E - 2420253N		
15		PBH-15	344980E - 2420253N		
16		PBH-16	335080E - 2420253N		
17		PBH-17	335180E - 2420253N		
18		PBH-18	335280E - 2420253N		
19		PBH-19	335380E - 2420253N		
20		PBH-20	334880E - 2420153N		
21		PBH-21	335380E - 2420153N		
22		PBH-22	335580E - 2420153N		
23		PBH-23	335680E - 2420153N		
24		PBH-24	335680E - 2420053N		
25		PBH-25	335480E - 2419953N		
26		PBH-26	335580E - 2419953N		

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27	2012-13	PBH - 27	335680E - 2419953N
28		PBH - 28	335580E - 2419853N
29		PBH - 29	335680E - 2419853N
30		PBH - 30	335480E - 2419753N
31		PBH - 31	335680E - 2419753N
32		PBH - 32	335280E - 2419653N
33		PBH - 33	335380E - 2419653N
34		PBH - 34	335680E - 2419653N
35		PBH - 35	335380E - 2419653N
36		PBH - 36	335680E - 2419553N
37		PBH - 37	335680E - 2419453N
38		PBH - 38	335780E - 2419353N
39		PBH - 39	335380E - 2411253N
40		PBH - 40	335580 E - 2421053N
41		PBH - 41	335680E - 2420853 N

Drilling in the virgin DLC forest area, Village Forest area and the area in which plantation is carried out is subject to obtaining permission from the Forest department.

Sl.No.	Block ID	Area (Ha)	Proposed bore holes	Remarks
1	DLC Forest Virgin after DRP clearance under FC Act	01.668	41	The location of the proposed bore holes is shown in the above table
	Total Area	01.565	41	

The detailed exploration in the lease area where exploration is not completed shall be taken up within the scheme period in accordance with the Rule 27 (3) of MCR 1960. The exploration drilling shall be taken up as per the above mentioned schedule.

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UNFC CODE 331

**GEOLOGICAL RESERVES****Proved Iron Ore**

S.N.	Section No.	Sectional Area Sq.m	Avg. Sectional Area Sq.m	Sectional Influence M	Volume Cum	TCF	Quantity Tons	Grade
			10052.34	50	502617	3.5	1759159.5	
1	Section-3	20104.68	19063.01	100	1906301	3.5	6672053.5	
2	Section-4	18021.34	18790.75	100	1879075	3.5	6626782.5	
3	Section-5	21560.16	18897.55	100	1889755	3.5	6649142.5	
4	Section-6	16434.94	26977.3	100	2697730	3.5	9092055	
5	Section-7	35519.86	33353.23	100	3335323	3.5	11673638.5	
6	Section-8	31186.6	35193.715	100	3519371.5	3.5	12317800.25	
7	Section-9	39200.83	38548.875	100	3854887.5	3.5	12791205.25	
8	Section-10	33893.12	27740.7	100	2774070	3.5	9708245	
9	Section-11	21688.28	17860.3	100	1786030	3.5	626005	
10	Section-12	14332.32	10986.595	100	1098659.5	3.5	3839674.25	
11	Section-13	7800.85	11874.325	100	1187432.5	3.5	4156013.75	
12	Section-14	18147.8	40054.875	100	4005487.5	3.5	14019208.25	
13	Section-15	83961.95	84088.395	100	8408839.5	3.5	29430417.25	
14	Section-16	64154.72	53334.07	100	5333407	3.5	18666824.5	
15	Section-17	42613.42	51604.085	100	5160408.5	3.5	18061422.75	
16	Section-18	80894.71	51898.985	100	5189898.5	3.5	18783548.25	
17	Section-19	49089.38	24008.365	100	2400836.5	3.5	8402227.75	
18	Section-20	4913.45	9785.108	100	978510.5	3.5	3424788.75	
19	Section-21	14856.78	10740.895	100	1074089.5	3.5	3750243.25	
20	Section-22	8824.83	6278.59	100	627859	3.5	2217855.5	
21	Section-23	3734.65	18888.775	100	1888877.5	3.5	6611071.25	
22	Section-24	34043	19331.435	100	1933143.5	3.5	6766002.25	
23	Section-25	4819.87	8824.35	100	882435	3.5	3086522.5	
24	Section-26	13028.83	11235.34	100	1123534	3.5	3932439	
25	Section-27	9442.25	4721.125	50	236056.25	3.5	826196.875	
		<b>GRAND TOTAL</b>			<b>83389127</b>		<b>271891943.5</b>	

For SERAJUDDIN & CO.  
 Jt. Manager  
 RQP/MA5/117/96/A

Nihar Ranjan Nayak  
 RQP/CA/891/2903/A

Y Nagendra  
 RQP/BB/08/2010-A

## Proved subgrade

UNFC CODE 331

S.N.	Section No.	Sectional Area	Avg. Sectional area	Sectional influence	Volume	TCF	QUANTITY	Remarks	
		Sq.m	Sq.m	m	Cu.m		Tons		
			198.98	50	9948	2.6	27574.4		
1	Section-3	393.92	1441.12	100	144112	2.6	403513.6		
2	Section-4	2488.32	2840.75	100	294075	2.8	823410		
3	Section-5	3393.18	5330.595	100	533059.5	2.8	1548566.8		
4	Section-6	7668.01	10860.32	100	1086032	2.8	3040689.6		
5	Section-7	14052.63	11498.183	100	1149818.3	2.8	3218934.6		
6	Section-8	6839.78	7338.89	100	733889	2.8	2054889.2		
7	Section-9	5738.02	3862.48	100	386248	2.8	1081494.4		
8	Section-10	1988.84	1871.75	100	187175	2.8	524090		
9	Section-11	1756.56	4892.07	100	489907	2.8	1315738.8		
10	Section-12	7641.59	5351.935	100	535193.5	2.8	1498541.8		
11	Section-13	5062.29	4276.78	100	427678	2.8	1197482.8		
12	Section-14	5491.23	12410.1	100	1241010	2.8	3474828		
13	Section-15	19328.97	15827.225	100	1582722.5	2.8	4486623		
14	Section-16	12525.48	8524.585	100	852438.5	2.8	2388627.8		
15	Section-17	4523.29	8230.88	100	823086	2.8	1744688.8		
16	Section-18	7836.83	6143.355	100	614335.5	2.8	1720138.4		
17	Section-19	4348.08	2568.005	100	256800.5	2.8	715041.4		
18	Section-20	787.63	655.315	100	65531.5	2.8	183488.2		
19	Section-21	522.7	775.815	100	77581.5	2.8	217172.2		
20	Section-22	1028.53	1291.88	100	129188	2.8	361728.4		
21	Section-23	1955.23	2788.115	100	278811.5	2.8	775072.2		
22	Section-24	3881	2977.285	100	297728.5	2.8	833638.8		
23	Section-25	1973.57	1233.785	100	123378.5	2.8	346454.2		
24	Section-26	483.96	718.98	100	71898	2.8	200748.8		
25	Section-27	839.96	488.88	50	24448	2.8	66797.2		
GRAND TOTAL							12228930	34223984	

Geological Reserves (Proved) 258.085 Million Tons

K Shanker  
RQP/MA5/117/92/A

Nihar Ranjan Nayak  
RQP/CA/25/2803/A

Y Nagendra  
RQP/BB/094/2910-A

For SERAJUDIN & CO 3-15  
Jt. Managing Partner

**GEOLOGICAL RESERVES**

UNFC CODE 332

Probable Iron ore

S.N.	Section No.	Sectional Area	Avg. Sectional area	Sectional Influence	Volume	TCF	QUANTITY	Remarks
		Sq.m	Sq.m	m	Cum		Tons	
			1958.685	50	97944.75	3.5	342805.625	
1	Section-3	3917.78	1958.685	100	195868.5	3.5	685613.25	
2	Section-4	0	1958.685	100	195868.5	3.5	685613.25	
3	Section-5	3041.11	2801.655	100	280165.5	3.5	980544.25	
4	Section-6	2662	3972.488	100	397248.5	3.5	1390373.25	
5	Section-7	5382.99	6445.58	100	644558	3.5	2255953	
6	Section-8	11508.17	6754.088	100	675408.5	3.5	2363929.75	
7	Section-9	0	1330.04	100	133004	3.5	465614	
8	Section-10	2660.06	2672.15	100	267215	3.5	935252.5	
9	Section-11	2684.22	3808.28	100	380828	3.5	1337167.5	
10	Section-12	6128.28	2778.158	100	277815.5	3.5	972354.25	
11	Section-13	428.09	1612.085	100	161208.5	3.5	564284.75	
12	Section-14	2789.34	6899.03	100	689903	3.5	2344660.5	
13	Section-15	10601.72	22370.455	100	2237045.5	3.5	7829659.25	
14	Section-16	34139.19	22399.32	100	2239932	3.5	7839762	
15	Section-17	10659.48	8610.76	100	861076	3.5	3013766	
16	Section-18	6562.07	10910.02	100	1091002	3.5	3818507	
17	Section-19	15257.97	6985.185	100	698518.5	3.5	2444814.75	
18	Section-20	4712.4	4733.025	100	473302.5	3.5	1656558.75	
19	Section-21	4753.85	4033.01	100	403301	3.5	1411553.5	
20	Section-22	3312.37	4780.385	100	478038.5	3.5	1673138.25	
21	Section-23	6246.42	6151.21	100	615121	3.5	2152823.5	
22	Section-24	6054	3027	100	302700	3.5	1059450	
23	Section-25	0	3284.31	100	328431	3.5	1142508.5	
24	Section-26	6528.62	4880.31	100	488031	3.5	1701108.5	
25	Section-27	3182	1898	50	79905	3.5	279300	
GRAND TOTAL					15835542.25		62825887.68	

FOR BERAJUDDIN & CO.  
K. S. Shaukat  
K. S. Shaukat  
Jl. M. ...

Nihar Ranjan Nayak  
ROPICAL/291/2003/A

Y. Nagendra  
ROP/BB/09/2910-A

Probable sub grade

UNFC CODE 332

S.N.	Section No.	Sectional Area	Avg. Sectional area	Sectional Influence	Volume	TCF	QUANTITY	Remarks
		Sq.m	Sq.m	m	Cum		Tons	
		0	0	50	0	2.8	0	
1	Section-3	0	0	100	0	2.8	0	
2	Section-4	0	573.955	100	57395.5	2.8	160707.4	
3	Section-5	1147.91	573.955	100	57395.5	2.8	160707.4	
4	Section-6	0	1167.83	100	116783	2.8	328992.4	
5	Section-7	2335.85	2227.7	100	222770	2.8	623758	
6	Section-8	2119.74	1059.87	100	105987	2.8	296553.8	
7	Section-9	0	827.67	100	82767	2.8	231747.8	
8	Section-10	1655.34	1028.77	100	102877	2.8	287485.8	
9	Section-11	388.2	2004.445	100	200444.5	2.8	561244.8	
10	Section-12	3810.69	1938.155	100	193815.5	2.8	542123.4	
11	Section-13	281.62	1840.12	100	184012	2.8	512239.8	
12	Section-14	5018.82	3580.678	100	358067.8	2.8	1002589	
13	Section-15	4142.73	8897.77	100	889777	2.8	2519375.8	
14	Section-16	13862.81	7338.78	100	733878	2.8	2054850	
15	Section-17	824.89	1004.14	100	100414	2.8	281159.2	
16	Section-18	1183.58	2911.94	100	291194	2.8	815343.2	
17	Section-19	4840.29	2682.275	100	268227.5	2.8	751037	
18	Section-20	724.28	1084.2	100	108420	2.8	297978	
19	Section-21	1404.14	827.27	100	82727	2.8	231836.8	
20	Section-22	250.4	927.155	100	92715.5	2.8	259288.4	
21	Section-23	1603.81	1229.485	100	122945.5	2.8	342247.4	
22	Section-24	855	427.6	100	42750	2.8	119700	
23	Section-25	0	232.765	100	23275.5	2.8	65171.4	
24	Section-26	485.51	680.44	100	68044	2.8	190523.2	
25	Section-27	895.37	447.685	50	22384.25	2.8	62676.9	
		<b>GRAND TOTAL</b>			<b>4518883</b>	<b>2.8</b>	<b>12548858</b>	

Geological Reserves (Probable): 85.270 Million Tons

K Shankar  
RQP/MAS/11798/A

Nihar Ranjan Nayak  
RQP/CAL/281/2083/A

Y Nagendra  
RQP/BBS/084/2010-A

For SERAJUDDIN & CO.  
Jt. Managing Partner

MINEABLE RESERVES

UNFC CODE 111

Proved mineable iron ore

S.N.	Section No.	Sectional Area Sq.m	Avg- Sectional area Sq.m 10032.34	Sectional influence m 50	Volume Cu.m 502817	TCF 3.5	QUANTITY Tons 1758199.5	Remarks
1	Section-3	20104.68	19063.01	100	1906301	3.5	6672053.5	
2	Section-4	18021.34	19780.75	100	1978075	3.5	6926752.5	
3	Section-5	21560.16	18897.56	100	1889755	3.5	6549142.5	
4	Section-6	15434.94	25877.3	100	2587730	3.5	9052055	
5	Section-7	35519.68	33353.23	100	3335323	3.5	11673880.5	
6	Section-8	31186.8	35193.715	100	3519371.5	3.5	12317800.25	
7	Section-9	39200.83	36546.875	100	3654687.5	3.5	12781406.25	
8	Section-10	33883.12	27740.7	100	2774070	3.5	9708245	
9	Section-11	21888.28	17880.3	100	1788030	3.5	6258105	
10	Section-12	14332.32	10988.665	100	1098866.5	3.5	3835047.25	
11	Section-13	7600.85	10767.72	100	1076772	3.5	3768702	
12	Section-14	13834.59	32278.98	100	3227898	3.5	11297843	
13	Section-15	50623.37	54238.28	100	5423828	3.5	18983381	
14	Section-16	57653.15	49407.395	100	4940739.5	3.5	17292588.25	
15	Section-17	40961.84	47740.885	100	4774089.5	3.5	16789243.25	
16	Section-18	54519.75	48173.355	100	4817335.5	3.5	16880674.25	
17	Section-19	41828.66	22214.64	100	2221464	3.5	7774914	
18	Section-20	2801.72	5742.65	100	574265	3.5	200927.5	
19	Section-21	5884.18	7210.72	100	721072	3.5	2523752	
20	Section-22	5538.08	4448.875	100	444887.5	3.5	1557106.25	
21	Section-23	3361.89	10222.12	100	1022212	3.5	3577742	
22	Section-24	17082.65	10264.735	100	1026473.5	3.5	3592967.25	
23	Section-25	3448.92	8237.875	100	823787.5	3.5	2883258.25	
24	Section-26	13028.83	10912.54	100	1091254	3.5	3819389	
25	Section-27	8796.25	4388.125	50	219906.25	3.5	769671.875	
<b>GRAND TOTAL</b>					<b>57487481</b>	<b>3.5</b>	<b>201138112.6</b>	

FOR SERAJUDDIN & CO.  
K Shankar  
Jt. Manager

Nihar Ranjan Nayak  
RQP/CAL/200/2803/A

Y Nagendra  
RQP/BB3/094/2810-A

UNFC CODE 111

Proved mineable  
subgrade

S.N	Section No.	Sectional Area	Avg. Sectional area	Sectional influence	Volume	TCF	Sub grade	Remarks
		Sq.m	Sq.m	m	Cu.m		Tons	
1	Section-3	383.92	196.96	50	9848	2.8	27574.4	
2	Section-4	2458.32	1441.12	100	144112	2.8	403513.6	
3	Section-5	3983.18	2940.75	100	294075	2.8	823410	
4	Section-6	7668.01	5530.588	100	553058.5	2.8	1548564.8	
5	Section-7	14052.83	10860.32	100	1086032	2.8	3040889.6	
6	Section-8	8938.76	11488.195	100	1148819.5	2.8	3218314.8	
7	Section-9	5738.02	7338.89	100	733889	2.8	2054889.2	
8	Section-10	1968.94	3862.48	100	386248	2.8	1081494.4	
9	Section-11	1755.58	1871.78	100	187175	2.8	524080	
10	Section-12	7641.58	4890.07	100	489007	2.8	1375738.8	
11	Section-13	3082.28	6381.935	100	638193.5	2.8	1788541.8	
12	Section-14	4792.36	3827.32	100	382732	2.8	1088548.8	
13	Section-15	16558.27	10874.31	100	1087431	2.8	2985805.8	
14	Section-16	10809.48	13582.875	100	1358287.5	2.8	3803205	
15	Section-17	4523.28	7686.386	100	768638.5	2.8	2118587.8	
16	Section-18	7778.17	8148.73	100	814873	2.8	2271924.4	
17	Section-19	4348.08	6082.125	100	608212.5	2.8	1697385	
18	Section-20	230.42	2288.25	100	228825	2.8	640980	
19	Section-21	300.94	285.68	100	28588	2.8	74390.4	
20	Section-22	1028.53	684.735	100	68473.5	2.8	186125.8	
21	Section-23	1418.92	1223.725	100	122372.5	2.8	348543	
22	Section-24	2876.73	2197.325	100	219732.5	2.8	615251	
23	Section-25	1707.54	2341.635	100	234163.5	2.8	655857.8	
24	Section-26	483.98	1100.75	100	110075	2.8	308210	
25	Section-27	888.98	716.98	100	71698	2.8	200748.8	
			489.98	50	23489	2.8	65797.2	
GRAND TOTAL					11448838		32057028.4	

Mineable reserve (Proved) = 233.193 Million Tons

K Shanker  
RQP/MS/117/88/ANihar Ranjan Nayak  
RQP/MS/201/2001/AY. Nagendra  
RQP/MS/094/2010-A

FOR SERAJUDDIN &amp; CO.

Jt. Managing Partner

3-19

**MINEABLE RESERVES**

UNFC CODE 122

Probable mineable iron ore

S.N.	Section No.	Sectional Area Sq.m	Avg. Sectional area Sq.m	Sectional influence m	Volume Cum	TCF	QUANTITY Tons	Remarks
			1958.9	50	97944.75	3.5	342606.625	
1	Section-3	3917.8	1958.9	100	195889.5	3.5	685613.25	
2	Section-4	0	1520.6	100	152058.5	3.5	532194.25	
3	Section-5	3041.1	2801.6	100	280155.5	3.5	980544.25	
4	Section-6	2562	3972.5	100	397249.5	3.5	1390373.25	
5	Section-7	5383	8445.8	100	844558	3.5	2956053	
6	Section-8	11509	5754.1	100	575408.5	3.5	2013828.25	
7	Section-9	0	1330	100	133004	3.5	465514	
8	Section-10	2680.1	2872.2	100	287215	3.5	985252.5	
9	Section-11	2884.2	3906.3	100	390623	3.5	1367187.5	
10	Section-12	5128.3	2778.2	100	277815.5	3.5	972384.25	
11	Section-13	428.03	1612.2	100	161218.5	3.5	564264.75	
12	Section-14	2786.3	6710	100	671004	3.5	2348514	
13	Section-15	10824	10944	100	1094405	3.5	3830417.5	
14	Section-16	11284	10902	100	1090180.5	3.5	3836688.75	
15	Section-17	10859	7174.7	100	717473	3.5	2511165.5	
16	Section-18	3890	5083.4	100	508343.5	3.5	1782702.25	
17	Section-19	6498.9	3525	100	352486	3.5	1233736	
18	Section-20	563.08	2137.1	100	213708.5	3.5	747979.75	
19	Section-21	3721.1	2858.7	100	285888.5	3.5	1032738.75	
20	Section-22	2180.3	2248.6	100	224894	3.5	786324	
21	Section-23	2313	3805.7	100	380571.5	3.5	1282000.25	
22	Section-24	4898.4	2449.2	100	244920.5	3.5	867221.75	
23	Section-25	0	2223.5	100	222332	3.5	778232	
24	Section-26	4447	3025.5	100	302547.5	3.5	1058918.25	
25	Section-27	1803.9	801.96	80	40097.75	3.5	140342.125	
<b>GRAND TOTAL</b>					<b>10117881.5</b>	<b>3.5</b>	<b>35412835.3</b>	

**FORSERAJUDDIN & CO.**  
 K Shankar  
 RQP/MS/117/MS/A  
 Jt. Manager

Nihar Ranjan Nayak  
 RQP/CAL/2012/203/A

3-20

Y Nagendra  
 RQP/MS/MS/2010-A

UNFC CODE 122

## Probable subgrade

S.N	Section No.	Sectional Area Sq.m	Avg. Sectional area Sq.m	Sectional influence m	Volume Cu.m	TCF	Quantity Tons	Remarks
1	Section-3	0	0	50	0	2.8	0	
2	Section-4	0	0	100	0	2.8	0	
3	Section-5	1147.9	573.96	100	57396.5	2.8	160707.4	
4	Section-6	0	573.96	100	57396.5	2.8	160707.4	
5	Section-7	2335.7	1167.8	100	116783	2.8	328992.4	
6	Section-8	2119.7	2227.7	100	222770	2.8	623756	
7	Section-9	0	1069.9	100	106987	2.8	299555.6	
8	Section-10	1655.3	827.67	100	82767	2.8	231747.6	
9	Section-11	398.2	1028.8	100	102877	2.8	287495.6	
10	Section-12	3610.7	2004.4	100	200444.5	2.8	561244.6	
11	Section-13	261.82	1936.2	100	193616.5	2.8	542123.4	
12	Section-14	3018.6	1640.1	100	164012	2.8	459233.6	
13	Section-15	4142.7	3580.7	100	358067.5	2.8	1002549	
14	Section-16	8279.9	8211.3	100	821130	2.8	1739184	
15	Section-17	824.89	4552.3	100	455229	2.8	1274838.4	
16	Section-18	1183.6	1004.1	100	100414	2.8	281359.2	
17	Section-19	2374.2	1776.9	100	177667	2.8	499063.6	
18	Section-20	284.46	1329.3	100	132930.5	2.8	372205.4	
19	Section-21	1204	744.25	100	74424.5	2.8	208388.6	
20	Section-22	250.4	727.22	100	72721.5	2.8	199620.4	
21	Section-23	782.44	518.42	100	51842	2.8	144597.6	
22	Section-24	855	818.72	100	81872	2.8	229241.6	
23	Section-25	0	427.5	100	42750	2.8	119700	
24	Section-26	408.7	204.35	100	20435	2.8	57218	
25	Section-27	563.95	461.33	100	46132.5	2.8	134771	
			276.98	60	13848.75	2.8	38778.5	
<b>GRAND TOTAL</b>					<b>3556338.25</b>		<b>9654924.7</b>	

Mineable Reserve (Probable) = 45.368 Million Tons

K Shankar  
RQP/MS/11796/ANihar Ranjan Nayak  
RQP/MS/281/003/AY Nagendra  
RQP/MS/3084/2010-A

For SERAJUDDIN &amp; CO.

3-21

Jt. Managing Partner

**3.4.6 Grade:**

Around 85% of total mineable reserves is of +58% Fe and balance reserves is less than -58% to +45% Fe as per the examination of ore exposures and analysis results. Details has been furnished in the bore hole log as annexed

**Typical Analysis**

Category	Max Fe%	Min Fe%	Average Fe%
Ore Sample 1	68.53	61.44	65.88
Ore Sample 2	68.62	60.66	66.06
Ore Sample 3	68.32	58.09	63.5

	Max Fe%	Min Fe%	Average Fe%
Sub grade 1	57.6	48.02	57.5
Sub grade 2	55.3	49.03	55.3
Sub grade 3	56.5	53.71	55.3

	Max Fe%	Min Fe%	Average Fe%
Waste 1	43.42	9.02	36.31
Waste 2	39.93	13.71	33.65
Waste 3	41.81	49.01	48.21

**3.4.7. Sub grade reserves of Iron ore**

In order to access the gradation of iron ore reserve within the lease area, the lessee has drilled 122 nos of core drilling and analyzed the Bore hole log data (Attached as Annexure - 10). Besides, 28 number of Old bore holes were also considered. Considering the above analysis report and existing pit workings, it is observed that the Balda Block Iron mines mainly consist of Hard Massive Ore, Hard laminated Ore and soft laminated ore above 58% Fe. The ore below 58% Fe and up-to 45% Fe is considered as Sub grade. This quantity forms only 15% of entire ROM. However it is proposed to mine the entire material as ROM.

Signed  
APPROVED

For SERAJUDDIN & CO.

Partner  
K Shanker  
ROP/MAS/117/88/A

Nihar Ranjan Nayak  
ROP/ICAL/2011/2883/A

Y Nagendra  
ROP/BBS/114/2010-A

**Details of Old Bore holes**

S.N	BH ID	LOCATION	RL	DEPTH
1	BH - 2	335080E-2421553 N	576.891	47.65
2	BH - 6	335080E-2421453 N	586.813	46.20
3	BH - 19	334880E-2421253 N	602.000	44.00
4	BH - 21	335080E-2421253 N	581.000	54.50
5	BH - 29	334780E-2421153 N	641.000	64.90
6	BH - 31	334980E-2421153 N	587.000	64.45
7	BH - 42	334880E-2421053 N	630.000	65.20
8	BH - 52	334280E-2420953 N	679.000	52.50
9	BH - 53	334380E-2420953 N	658.000	38.10
10	BH - 62	335350E-2420953 N	592.000	34.20
11	BH - 70	334480E-2420853 N	666.000	41.10
12	BH - 72	334680E-2420853 N	652.000	59.50
13	BH - 122	334580E-2420553 N	653.000	37.50
14	BH - 146	335280E-2420453 N	587.000	44.40
15	BH - 172	336080E-2420353 N	571.000	64.35
16	BH - 175	334480E-2420653 N	656.000	23.50
17	BH - 186	335480E-2420253 N	580.000	18.30
18	BH - 189/1	335780E-2420253 N	553.000	11.70
19	BH - 189/2	335880E-2420253 N	550.000	18.00
20	BH - 191	335980E-2420253 N	571.000	60.75
21	BH - 227	336080E-2420053 N	593.000	58.15
22	BH - 250	335280E-2419853 N	584.000	37.76
23	BH - 258	336080E-2419853 N	584.000	67.30
24	BH - 285	335980E-2419553 N	554.500	28.30
25	BH - 288	336180E-2419653 N	559.000	22.20
26	BH - 311	335940E-2419413 N	557.000	11.60
27	BH - 331	335830E-2419103 N	557.000	36.95
28	BH - 339	335480E-2418853 N	554.000	53.80
<b>TOTAL METERAGE</b>				<b>1202.05</b>

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3-23

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Jt. Managing Partner

**Resources (other than in - situ):**

5 sub grade dumps are available having a quantity of 8.12 Million T and 3 stocks of screen fines and crushed fines of 1.35 Million T is available. The grade of Sub grade stock is ranging between 52.40 to 57.35% Fe and that of screen / crushed fines is between 61 to 63% Fe. Refer Annexure - 11A for dump wise grade. The approximate grade of ore from the sub grade dump workings shall be about 60% of + 62 % Fe which will be used for blending.

For For SERAJUDDIN & CO.  
JL. Mangrove

Partner  
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*Y Nagendra*  
Y Nagendra  
RQP/BB/S/09/4/2010-A

**ECONOMIC AXIS**

S. N.	E 1 (Economic)	Status
1.	Detailed exploration.	Detailed exploration is carried out. Further it is pertinent to state that the mine is in operation since 1962 proving its economic viability
2.	Mining report / mining plan/ working mines.	Mining plan and report is being regularly prepared and the mine is being worked systematically and scientifically
3.	Specific end - use grades of reserves ( above economic cut - off grade).	<p>The Iron ore produced from this mines is sold to various customers M/s Anjani Steels, M/s Bhushan Steel and Power, M/s Howrah Gases, M/s Patnaik Steels &amp; Alloys limited, M/s Rashmi Cement Ltd, M/s Rashmi Metalliks Ltd, M/s Visa Steel Ltd, M/s Super Smelter Ltd, M/s Vision Sponge Iron Pvt Ltd, M/s Shyam Sel &amp; Power Ltd, M/s Shanti Gopal Concast, M/s Orissa Sponge Iron &amp; Steel Ltd, etc</p> <p>Besides some portion of the ore is being exported.</p>
4.	Specific knowledge of forest / non forest and other land use data.	<p>The area comprises of 77.461 ha of non forest land and 258.133 hectares of forest land, out of which 36.182 ha classified as Village forest and balance 218.951 ha are forest kismam recommended by District Level Committee. The approval for 24.446 ha of village forest under F.C Act 1960 has been accorded by MOEF, GOI, New Delhi vide Ir No 8-119/96-FC, dtd 11.12.1998 as Stage II clearance.</p> <p>As per joint verification a total area of 117.949 Hectares, broken up prior to 1980 out of which 1.618 hectares of village forest land, 112.773 hectares of DLC forest land and 3.558 hectares of non - forest land. Now the applicant has asked 111.965 hectares of broken up land and 92.373 hectares, of virgin area to be diverted for non forest use for various Mining activities under forest conservation act excluding the prohibited and protected area of 15.613 hectares of forest land as earmarked for safety zone.</p>

K. Shankar

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## FEASIBILITY AXIS

SL. NO	F 1 (Feasibility study )	Status
1.	<b>Geology:</b> Geology of area and project, detailed exploration, closed spaced drilling, ore body modeling, bulk samples for beneficiation, geotechnical and ground water & surface waters studies.	<b>Geology:</b> Geology of area and project, detailed exploration, geotechnical studies have been carried out and the details of geology is given in PMCP under para 2.0 and exploration details under Para 3.4.4
2.	<b>Mining:</b> Mining plan, mine recoveries and efficiencies, equipment selection, manpower requirement.	<b>Mining:</b> Detailed Mine planning, recovery and selection of equipment are furnished under chapter 3.0 (Reserves), Mining Chapter 5.0 etc. Details of manpower is furnished in already approved mine plan. The manpower of 75 technical and 540 Highly skilled/skilled/sami skilled and unskilled work force is shown in the Scheme of Mining.
3.	<b>Environment:</b> EIA studies and EMP including socio - economic impact, rehabilitation of project affected persons, waste disposal/ reclamation, detailed land use data.	<b>Environment:</b> EIA studies have been carried out for the mining activities. The Environmental clearance for mining of 1.48 MTPA is enclosed. The 4.5 MTPA Environmental clearance from MOEF is approved in principle vide its minutes which is uploaded in the website. Refer Annexure -4 for the Minutes and recommendations for 4.5 MTPA EC
4.	<b>Processing:</b> Pilot scale investigation data, list of equipment, manpower and environmental consideration like waste disposal of tailing, etc.	<b>Processing:</b> List of equipment, manpower and environmental consideration like waste disposal is considered during the preparation of EIA. Brief description of the same is enclosed in the Scheme of mining under para 3.0.
5.	<b>Infrastructure and services, construction activities:</b> Full details	Infrastructure services necessary for the operation of the mining activities is provided
6.	<b>Costing:</b> Detailed break-up of capital cost, details of working capital.	Details of capital cost and working capital details are given below.
7.	<b>Marketing:</b> Overview, specific market aspects.	Details of marketing overview and specific market aspects are given.
8.	<b>Economic viability:</b> Cash flow forecast, inflation effects, sensitivity studies.	Economic viability is given below
9.	<b>Other factors:</b> Statutory provisions relating to labour, land, mining, taxation etc.	All the statutory provisions such as Labour Laws, Land matters, Mining, taxation etc are complied as per existing laws

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ROP/BB/094/2010-A

**CAPITAL COST**

Equipment	Class	Nos	Rate (in Lacs Rs.)	Amount (in Lacs Rs.)
Crawler mounted drill	Sanyok DP1100 Hydraulic drill	1	200	200
Crawler mounted drill	DX 800 Hydraulic Drill	1	125	125
Hydraulic Shovel	PC 1250	3	250	750
Hydraulic Shovel	Ex- 870	0	200	0
Loader WA 900	-----	0	80	0
Loader WA 800	-----	3	40	120
Loader	ZL50G	2	35	70
Dumpers (85 T)	HMM/Komatsu	18	320	5760
Dumpers (35 T)	Volvo	15	75	1125
Dozer	D - 155	2	150	300
Rock Breaker	-----	3	75	225
Grader	CAT	1	10	10
Water Tanker	NM	6	15	90
Diesel Tanker	AL	3	12	36
Diesel Breaker	AL	2	12	24
Mobile Service Van	AL	2	15	30
Welding Machine	ADOR	4	2	8
Transformer	SK ELECTRICAL	1	5	5
Air Compressor	ELGI	1	7.5	7.5
Car Washer	ATS ELGI	1	1.5	1.5
Staff Bus	TATA	3	12	36
Light Vehicle	MAHINDRA	10	6	60
DG	CAT	8	15	120
Light Mast	IR	20	0.5	10
Ambulance	MAHINDRA	1	15	15
Explosive Van		1	12	12
Screening plant (Stationary)		1	2500	2500
Crushers (Stationary)		1	2200	2200
Screening plant (Mobile)		0	250	0
Crushers (Mobile)		0	320	0
Land Rent	Storage	3	60	180
Staff Quarters	Executive	1	10	10
Staff Quarters	Workmen	2	10	20
<b>TOTAL</b>				<b>14056 lakhs OR 148 Crores</b>

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Jl. Managing Partner

Operating cost

Cost per MT of product (avg) - Rs.989.84

EXPENDITURE 2010 - 11	Rs in Cr	%	Rs/ MT
SALARIES	11.65	0.70%	0.94
STAFF WELFARE	1.94	0.12%	1.16
ROYALTY & CESS	609.65	36.67%	362.97
PRINTING & STATIONERY	0.20	0.01%	0.12
POSTAGE & COURIER	0.20	0.01%	0.12
TELEPHONE & FAX	0.40	0.02%	0.24
TAXES & FEES @ 30% of sales	569.40	34.25%	339.01
CIVIL WORKS	3.00	0.18%	1.79
DRILLING	5.12	0.31%	3.05
BLASTING	6.72	0.40%	4.00
LOADING	20.16	1.21%	12.00
HAULING	16.80	1.01%	10.00
CONVEYANCE	1.23	0.07%	0.73
STORES & SPARES	220.00	13.23%	130.98
REPAIRS & MAINTENANCE	22.00	1.32%	13.10
DIESEL & OIL	83.98	5.05%	50.00
CSR	33.59	2.02%	20.00
SECURITY CHARGES	1.09	0.07%	0.65
RENT	0.43	0.03%	0.26
OTHERS	25.00	1.50%	14.88
INSTALMENT	30.00	1.80%	17.88
<b>GRAND TOTAL</b>	<b>1662.56</b>		<b>989.84</b>

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Market Overview

- 1 Market for sized ore and fines is in the increasing trend
- 2 The Export market is encouraging
- 3 Local steel plants / sponge plants are demanding more quantity of sized ore and fines
- 4 Logistics for the increased ore demand is in the improving trend
- 5 Systematic approach for iron ore mining
- 6 Systematic approach for iron ore dispatch
- 7 Specific market aspects- The ore will be consumed in both domestic and export sectors.

PROVED ORE :GEOLOGICAL AXIS

SL. NO	G 1 ( Detailed Exploration )	Status
1.	<p><b>Geological survey :</b></p> <p>(i) Mapping – for other minerals 1:1000.</p> <p>(ii) Preparation of detailed topographical –cum- geological map including all surface geological features, extent of deposit, structure, location of boreholes, assay plan and sections of exploratory mine development and borehole data;</p> <p>(iii) Topogrid / Triangulation stations / identified fiducials linking in the maps.</p>	<p>i) Mapping : Detailed mapping in 1:2000 scale is conducted</p> <p>ii) A detailed topographic cum geological map is prepared incorporating all the surface geological features, Bore holes, proposed bore holes with a contour interval of 2 m. Based on the bore holes 30 geological cross sections were constructed and the reserves were estimated</p> <p>iii) Permanent bench marks have been establish and the co-ordinates of all the corner points were given.</p>
2.	<p><b>Geochemical survey:</b> Detailed grid pattern sampling and analysis.</p>	Detailed sampling of the Bore holes were conducted and the same were analyzed. The analytical data was utilized in the construction of the sections.
3.	<p><b>Geophysical survey:</b> Detailed and specific borehole geophysical survey.</p>	No geophysical survey was carried out

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*Serajuddin*  
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4.	<b>Technological:</b> (i) Drilling - closer spaced (with definite grid pattern) than that for G2 category;  (ii) Exploratory mining and check drilling results if possible;  (iii) Sampling - systematic pit and trench sampling, core and sludge sampling for laboratory scale and bulk sample for the pilot plant scale beneficiation studies.	i) Drilling. Detailed drilling in the ore zone has been conducted by drilling 122 nos of Bore holes with an average spacing of about 100 X100 m.  ii) Exploratory mining :Mine is in operation since 1962 and the drill results can be correlated with the actual mining being carried out  iii) Systematic sampling of the bore holes have been carried out and the same is utilized for cross section preparation and reserves estimation.
5	<b>Petrographic and mineralogical study:</b> Refining of data on the petrographic character of rocks of the deposit and its surroundings, alterations (if any), including study of grain size texture of gangue and its liberation characteristics for further refining of data.	Grain size, texture of gangue and its liberation characteristics will be studied and the details will be furnished.
6	<b>Geo statistical analysis of borehole data</b> thickness of ore : Waste encountered in holes, assay values of samples if considered necessary	No Geo statistical analysis has been conducted. However thickness of ore is ascertained based on the drilling data.

For  
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## CHAPTER - 4



### CONCEPTUAL MINING PLAN

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For SERAJUDDIN & CO.

Managing Partner

#### 4.0 CONCEPTUAL MINING PLAN

Mine has been planned for a projected maximum production of 15.15 MTPA of ROM. Total estimated mineable reserve within the area is 278.581 million tons. Estimated production during five years would be 65.22 million tons of Iron ore. Therefore, remaining reserve, 213.341 million tons will have a life of about 14.22 years with the projected average production of 15.0 MTPA of ROM. Therefore, anticipated life of the mine would be  $5 + 14.22 = 19.22$  say 20 years.

However, the reserves will get modified once the exploration is completed after obtaining Forest clearance for the balance area. Necessary modifications will be incorporated in the mine plan; accordingly the life of the mine may increase.

#### 4.1 The Ultimate extent & size of the pit

About 250.476 Ha of area is covered by the mining during the conceptual period. Keeping in view, 50 m safety zone on either side along H.T. electric line, passing through the area, 7.5m zone along the M.L. boundary, 50m along express highway on either side and 50m along perennial nalah etc. the ultimate extent of pit will cover a total surface area of 250.476 Ha. As per the present exploratory status, thickness of in-situ Iron ore likely to be excavated up to conceptual planning period is up to 480 RL including working of the Proved and Probable Iron ore.

The entire area will be worked as 3 blocks one each on the Northern, central and southern side of the lease area.

#### 4.2 The final slope angle

During proposed planning period, the individual benches will be kept at nearly 60° slope angle. Ultimate pit slope will be kept at 37.5° with the horizontal.

#### 4.3 Ultimate pit limit boundaries

In the conceptual stage pits shall be developed for Iron ore over an area of 250.476ha. The ultimate pit limit boundaries around the deposit have been earmarked in the conceptual plan (Ref. Plate 08) & sections (ref. Plate 09).

#### 4.4 Ultimate capacity of Dumps

The total waste generated by mining is 36.85 Million Tons, which includes 6.30 Million Tons during the present scheme period and 30.55 Million Tons during the conceptual period.

Out of 6.30 Million Tons likely to be generated during the scheme period, 2.03 Million Tons of waste to be generated in the fourth (2015-16) & fifth year (2016-17) will be temporarily stored in the Kalimati pit. Hence the balance waste is 4.27 Million Tons. Out of the balance waste 30 % of the quantity will be utilized for bund and road making and 70% of the 4.27 Million Tons i.e. 2.99 Million Tons or 1.38 Million Cubic m will go to the designated

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two dump yards namely Dump A and Dump B. The waste generated from mines shall be dumped in the proposed earmarked area in the non mineralized zone in the northeastern and eastern part of the lease area. (REF. PLATE - 6A to 6E) The area proposed for dumping is proved barren by drilling bore holes. The materials shall be transported to the dumping site by dumpers and tippers. The dumps shall be maintained to a height about 30 meters in total over an area of 7.35 ha during the scheme period. The ultimate dump slope shall be maintained at 28°.

From the next scheme period the waste generated will be directly utilized for backfilling.

#### Land Degradation/Reclamation/Afforestation:

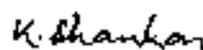
During conceptual planning period, the pits will be worked both depth wise and extended laterally. The waste generated during this period will be used for backfilling the worked out pit in all the 3 blocks.

However as the generation of the waste quantity is less the entire mined out area will be not filled. Refilled portion will be afforested and the remaining portion will be left as water reservoir.

Since the bottom of the ore is proved, after extraction of the mineral the area will be refilled.

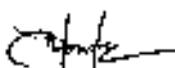
On the basis of present demarcation of ore limit as per exposures and depth of the pits, ultimate pit limits have been demarcated.

A total of 220.458 Ha land is required to be used for mining & allied activities during the Scheme period and during the conceptual period about 250.476 Ha will be utilized for mining and 52.892 Ha will be utilized for other allied activities like road and safety zone plantation over an area of 4.686 ha for road and 48.206 for safety zone. The details are tabulated as below:



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Sl No	Head	Area put on use at start of scheme (Ha)	At the end of scheme period(Ha)	End of Conceptual period (Ha)
1	Area of excavation	68.617	117.27	250.476
2	Storage of top soil	Nil	Nil	Nil
3	Overburden/dump	31.203	32.253	Nil
4	Mineral Storage	1.198	1.196	Nil
5	Infrastructures(Workshop/Building)	0.200	3.000	Nil
6	Roads	7.210	8.010	4.686
7	Railways	Nil	Nil	Nil
8	Safety Zone	25.600	48.206	48.206
9	Effluent treatment plant	Nil	Nil	Nil
10	Mineral Separation plant	Nil	7.610*	Nil
11	Magazine	0.189	0.189	Nil
12	Temporary Colony	0.834	0.834	Nil
13	Others (Retaining wall, check dams)	0.682	0.680	Nil
14	Area utilized	133.611	220.488	303.368
15	Area for future plantation in Safety Zone	22.606		
16	Area which will remain untouched for future exploration	179.377	115.136	32.226
<b>TOTAL</b>		<b>335.594</b>	<b>335.694</b>	<b>335.594</b>

\* Mineral separation plant by way of stationary screening cum crushing plant over an extent of 7.610 Ha within the plan period. Crusher, screen and weighbridge will be dismantled after the mining operation completed.

During the conceptual period, the dumps will be re-handled and refilled into the worked out pits. Hence there will be no dumps at the end of the conceptual period

#### 4.5 Post Mining Land-use at the end of life of the mine

##### a) Mined out Land

##### During Planned Period

##### Mined out area:

A total of 117.27 Ha of land will be degraded by mining during the scheme period. 32.253 Ha will be utilized for dumping which includes both new dumps and the existing dumps. The dump is only a temporary in nature and will be re-handled for backfilling the worked out pit during the conceptual period. 2.03 Million Tons of waste to be generated in the fourth (2015-16) & fifth year (2016-17) of the scheme period will be temporarily stored in the Kalmati pit. No reclamation is proposed during the Scheme period.

##### Other than mining and dumping area

A total of 7.610 ha of mineral separation plant, 48.206 has of safety zone plantation, 3.00 ha of infrastructure, 9.01 Ha of road, 0.834 ha of township and 0.68 ha of retaining wall is the proposed land use pattern during the scheme period.

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Managing Director

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RQP/BBS/094/2010-A

**Conceptual period****Mining area**

During the conceptual period about 250.476 Ha will be utilized for mining and other allied activities like infrastructure, about 4.686 ha for road and 48.206 for safety zone. An area of 32.226 Ha will be left undisturbed and kept for future exploration.

A total of 250.476 Ha of land will be utilized during conceptual period for mining. Details of the location, area & types of reclamation/rehabilitation measures have been given below

Name of the Quarry	Period of Reclamation & Rehabilitation Measures	Location	Area (Ha)	Type of Reclamation & Rehabilitation Measures
Balda Block Iron Mines	Conceptual period	Mining area.	250.476	Back filling, Plantation & water storage

**Other than mining area**

A total area of 32.253 Ha will be utilized for temporary dumping during the scheme period. During the conceptual period the same dump will re-handled and used for refilling the worked out pit. After re-handling the dump the area will be covered with green belt after carrying out exploration.

Name of the quarry	Period of Reclamation & Rehabilitation Measures	Location	Area (Ha)	Type of Reclamation & Rehabilitation Measures
Balda Block Iron Mines	Conceptual Period	Other than quarry area.	32.253	After re-handling the dump, sub grade and magazine area will be covered with green belt.

**Roads.**

The roads which are utilized during the mining operations will be covered with avenue plantations on either side of the road.

**Infrastructure:**

The mines site office will remain until the complete dismantling job is completed and then it will be removed. The crusher/ screen will be dismantled and reused or sold.

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**Safety zone plantation/Green Belt:**

An area of 48.206Ha all along the boundary, HT Line, Road, Nalka is considered for Safety zone

**4.6 Conceptual working**

During the conceptual period a production of 75.06, 74.64 and 63.63 Million tons will be carried out during 2017-22, 2022-27, 2027-32 slab of 5 years respectively. The development quantities during the corresponding period is 11.04Million Tons (2017-22), 9.31 Million Tons (2022-27) and 10.20(2027-32) Million Tons respectively. The details of the quantities are given below.

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FOR SERA

FILE

JL. Managing Partner 4-1

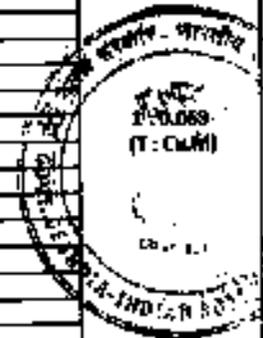
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Y Nagendra

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Sl.No.	Section No.	TOTAL ROM Quantity for Conceptual period	TOTAL WASTE Quantity for Conceptual period	Stripping Ratio
		0	72435	
1	Section-2	1420351.275	1247840	
2	Section-3	4886135.5	1930060	
3	Section-4	4426743.65	1472790	
4	Section-5	5087816.65	1241360	
5	Section-6	9532835.2	1834560	
6	Section-7	14427446.25	1909270	
7	Section-8	13882572.55	1154450	
8	Section-9	11724193.5	1021790	
9	Section-10	8853075.35	1300310	
10	Section-11	6227795.8	1350470	
11	Section-12	6011992.7	729850	
12	Section-13	2534425.95	989710	
13	Section-14	13512479.75	1986590	
14	Section-15	22700254.15	2656400	
15	Section-16	18363863.6	1268210	
16	Section-17	15563853.9	685200	
17	Section-18	15893734.68	1121670	
18	Section-19	8971222.95	780870	
19	Section-20	3040586.25	795300	
20	Section-21	3546261.01	1012110	
21	Section-22	1322846.35	232210	
22	Section-23	4370537.2	1700160	
23	Section-24	4545666.3	1855260	
24	Section-25	3964786	357510	
25	Section-26	5213825.05	376090	
26	Section-27	1014587.7	61640	
	Total	213337944.3	30830020	1:0.14 (T:O)



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Sl.No.	Section No.	ROM Quantity for 2017 - 2022	Waste Quantity for 2017 - 2022	ROM Quantity for 2022 - 2027	Waste Quantity for 2017 - 2022	ROM Quantity for 2027 - 2032	Waste Quantity for 2017 - 2022
		0	72436	0	0	0	0
1	Section-2	1420551.275	1247840	0	0	0	0
2	Section-3	4886115.5	1939980	0	0	0	0
3	Section-4	4426743.65	1472780	0	0	0	0
4	Section-5	5087816.65	1241360	0	0	0	0
5	Section-6	9572835.1	1634550	0	0	0	0
6	Section-7	0	0	0	0	14427446.25	1909270
7	Section-8	0	0	0	0	13882572.65	1154450
8	Section-9	0	0	3517259.55	308537	8206988.95	716253
9	Section-10	0	0	8853075.95	1500310	0	0
10	Section-11	0	0	8227795.8	1350470	0	0
11	Section-12	0	0	6011982.7	729650	0	0
12	Section-13	0	0	2534425.95	388710	0	0
13	Section-14	0	0	13512478.75	1885580	0	0
14	Section-15	0	0	22700254.15	2855400	0	0
15	Section-16	9280931.8	633105	9280931.8	633105	0	0
16	Section-17	15563858.9	888200	0	0	0	0
17	Section-18	15893734.68	1121670	0	0	0	0
18	Section-19	8971212.95	780870	0	0	0	0
19	Section-20	0	0	0	0	3040685.25	785300
20	Section-21	0	0	0	0	3546261.01	1012110
21	Section-22	0	0	0	0	1322846.35	232210
22	Section-23	0	0	0	0	4370517.2	1700180
23	Section-24	0	0	0	0	4545666.3	1855280
24	Section-25	0	0	0	0	3964786	387510
25	Section-26	0	0	0	0	5233825.05	376090
26	Section-27	0	0	0	0	1014587.7	81640
	Total	74053595.6	11035800	74638215.05	8310972	63636133.91	10199453

K Shankar

RQP/MAG/117/2010-A

Nihar Ranjan Nayak

RQP/MAG/251/2003/A

Y Nagendra

RQP/BBS/004/2010-A

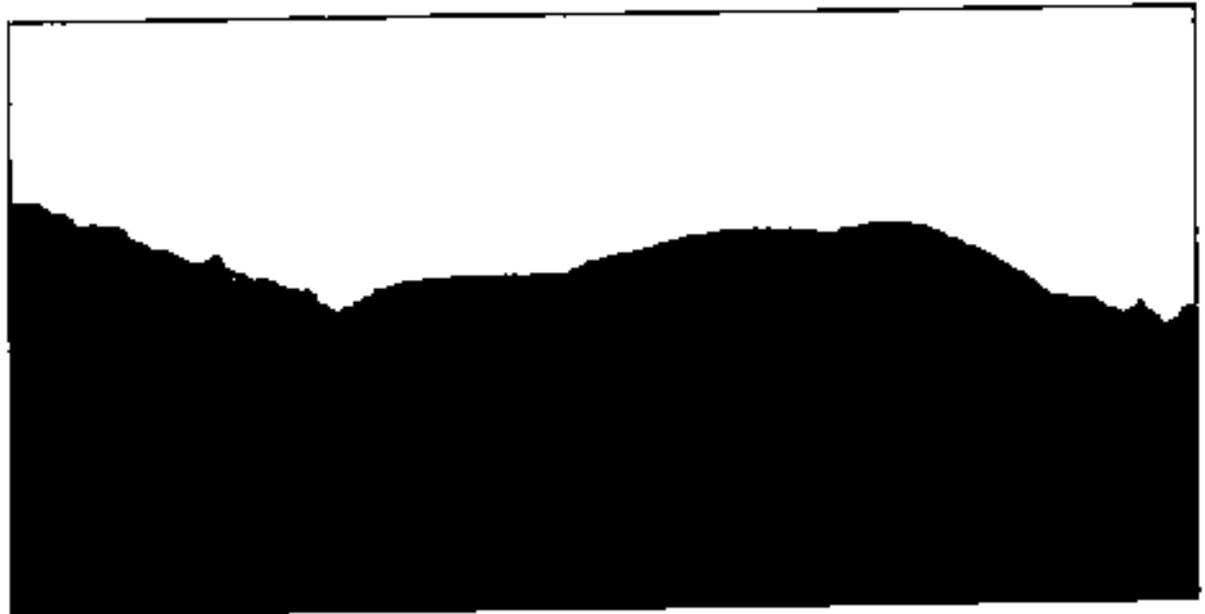
For SERAJUDDI

4-6

Jt. Managing Partner



Systematic benching operation



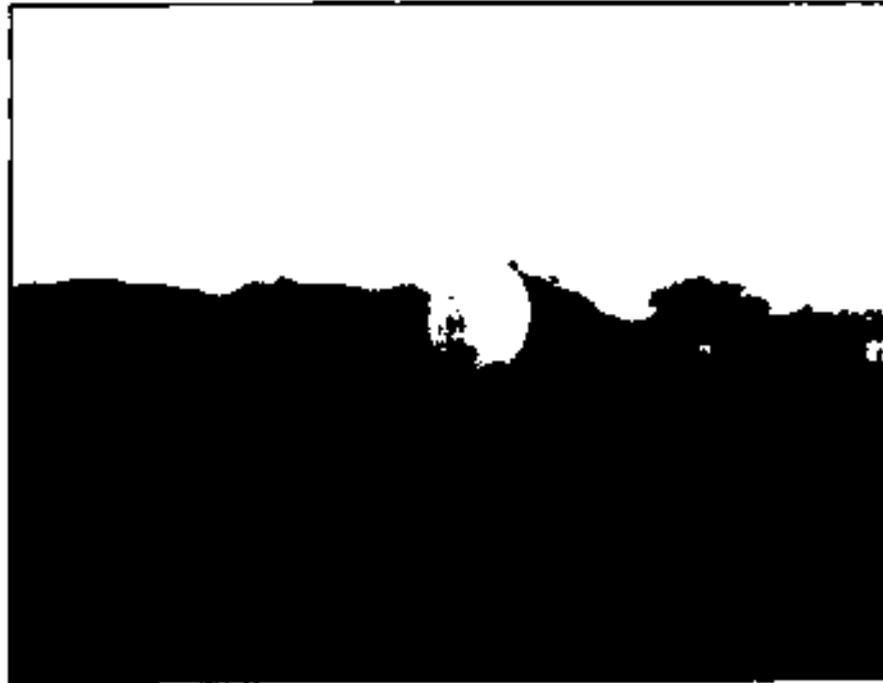
Stabilized Dumps

For SEH. JUDDIN & CO.  
Jt. Managing Partner  
*[Signature]*

*[Signature]*  
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*[Signature]*  
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Y Nagendra  
ROP/BS/094/2018-A



Haul Road dust control by water sprinklers



Systematic Exploration by LF90D Board Longyear Co.

APPROVED

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*Sera Juddin*  
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# CHAPTER - 5



## MINING

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For SERAJUDDIN & CO.  
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Jt. Managing Partner

Chapter - V**5.0 MINING****5.1 Salient description of present mining methods.**

The method of working is opencast mechanized mining considering various technical parameters like surface topography, continuation of Iron Ore deposit, quality variations, geo-technical aspects, required rate of production etc., It is proposed to work this deposit by adopting 10.0 m bench height, with width more than the height of benches and with an ultimate pit slope of 37.5°. The ramp gradient shall be kept at least 1 in 14.

**Pre production development work:**

The main work comprises of overburden removal, and access road construction to reach the ore benches.

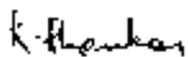
The following are the steps involved for winning Iron Ore.

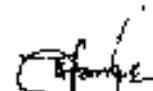
**Drilling:** Hydraulic / Pneumatic drills shall be used to drill holes with 115/102 mm diameter to a depth of 11 meters in a single or multiple rows.

**Blasting :** The blasting operation will be carried out by non electric shock tubes using emulsion and slurry explosives to achieve better fragmentation and less throw with minimum ground vibration.

**Loading and Hauling:** Excavator / backhoe with the combination of 85 T dumpers will be deployed for development / production and Wheel loaders with combination of Volvo 30 T dumpers will be used for transportation/handling of mineral at screens and crushers.

The area has been worked by developing pits in different blocks. Details regarding pits and Dumps are given below

  
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For SERAJUDDIN  
  
Jt. Managing Partner  
5-1

## DIMENSIONS OF EXISTING PIT

S.NO	BLOCK	PIT	NORTHING	EASTING	DIMENSION
1	BLOCK - 1	PIT - 1	2420967.51 - 2421529.95	334785.74 - 335063.90	388m X 214m
2	BLOCK - 1	PIT-2 & 5	2420445.45 - 2421025.23	334745.91 - 335350.29	382m X 438m
3	BLOCK - 2	PIT - 4	2419764.88 - 2420154.05	334637.17 - 335382.83	228m X 357m
4	BLOCK - 4	KALIMATI QUARRY	2419183.51 - 2419605.15	335144.08 - 335424.04	375m X 127m
5		PIT - 5A	2420801.08 - 2421049.93	334534.69- 334727.58	255m X 128m
6		PIT - 6	2418814.79 - 2419145.89	335701.82 - 335943.82	233m X 118m
7		PIT - 9	2418998.74 - 2419336.01	335580.87 - 335726.18	220m X 166m

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5-2

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DIMENSIONS OF EXISTING DUMP									
S.N	DUMP	MATERIAL	LOCATION	LENGTH (m)	WIDTH (m)	HEIGHT (m)	VOLUME (Cu. m)	TCF	TONNAGE
1	DUMP - 1	SUB GRADE	PIT-1	246	180	25	1107000.00	2	2.21
2	DUMP - 2	SUB GRADE	PIT-5	103	178	18	330012.00	2	0.68
3	DUMP - 3	SUB GRADE	OFFICE	248	323	14	1121456.00	2	2.24
4	DUMP - 4	SUB GRADE	WORKSHOP	115	120	14	193200.00	2	0.39
5	DUMP - 5	WASTE	KALIMATI PIT	216	163	26	915408.00	2	1.83
6	DUMP - 6	SUB GRADE	PIT-6	380	141	25	1339500.00	2	2.68

NOTE: Dump 1, 3 and 4 which were earlier considered as waste dumps and are now considered as subgrade dumps based on the revised threshold limit set by IBM. The TCF of 2 is taken for the loose dump.

S.N	DUMP	MATERIAL	LOCATION	LENGTH (m)	WIDTH (m)	HEIGHT (m)	VOLUME (Cu. m)	TCF	TONNAGE
1	STOCK-1	SCREEN FINES	PIT-1	164	105	20	386400.00	2	0.77
2	STOCK-2	SCREEN FINES	STORE	117	59	11	75933.00	2	0.15
3	STOCK-3	CRUSHED FINES	QUARRY-4	121	111	16	214896.00	2	0.43

For SERAJUDIN  
  
 J. Managing Partner

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*Nihar Ranjan Nayak*  
 Nihar Ranjan Nayak  
 ROPICAL/28/12/003/A

5-3

*Y Nagesandra*  
 Y Nagesandra  
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**5.2 YEARLY PIT-WISE DEVELOPMENT PROPOSED FOR NEXT FIVE YEARS (2012-2017)**

Mining operation is being carried out since 1962 for iron ore from the mines. The iron ore mined is utilized to cater the local sponge and steel plants in the State.

Based on the detailed exploration carried out by drilling 122 Core boreholes it was decided to increase the production capacity of the maximum of 15.15 MTPA.

**i. Method of Mining:**

The mining is proposed to be carried out by "mechanized open-cast mining method by adopting 10 m height benches. The width of the bench is more than the height of benches.

**ii. Use of Mechaneries:**

Mining equipments like crawler drill, dumpers and hydraulic excavators shall be used. Processes of excavation and loading of overburden/waste will be done by deploying hydraulic excavators and dumpers.

**iii. Manpower uses.**

There shall be deployment of 715 persons in total for the targeted production. The distribution is as follows:-

✓	Management and supervisory personnel	-	75 persons
✓	Skilled	-	490 persons
✓	Semi skilled	-	160 persons
✓	Unskilled	-	40 persons

**5.3 YEARWISE PRODUCTION PLAN PROPOSED FOR NEXT FIVE YEARS ALONG WITH GRADE.**

The process of development has been shown in the proposed pit section for scheme period for the coming five years. It is proposed to develop the pit vertically as well as laterally in judicious manner. At end of the scheme period the depth of the pit would be increased.

- The probable depth has been considered for development of pits.
- ROM will be mined
- Side-burden waste is the development quantity proposed along with overburden if available in the working sections.
- Tonnage conversion factor for Iron was considered as 3.5Tons/Cum.
- 50 m either side along H.T. electric line passing through the area, 7.5m around the M.L. boundary, 50 m along express highway on either side and 50 m along perennial nalah has been kept for safety zone.
- The general pit slope is considered to be 37.5°.

Presently during the scheme period (2012 -2017) it has been planned for extraction of maximum 15.15 MTPA ROM from within the lease area. Summary and details of year wise development are tabulated below:-

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RQP/IBS/094/2010-A

## 1st YEAR MINING (2012-13)

## BLOCK - A

## Iron ore (2012-13)

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	Quantity (Tons)	RL (m)
1	Section-3	1090.5	549.75	50	27487.5	3.5	96206.25	600 RL
2	Section-4	185.05	92.275	100	94227.5	3.5	224796.25	600 RL
3	Section-5	352.61	288.83	100	28883	3.5	94006.5	600 RL
4	Section-6	0	176.305	100	17630.5	3.5	61708.75	600 RL
5	Section-7	255.19	127.595	100	12759.5	3.5	44858.25	600 RL
6	Section-8	836.73	445.96	100	44596	3.5	156086	580 RL
7	Section-9	1098.89	867.81	100	86781	3.5	303733.6	570 RL
8	Section-10	1564.44	1331.865	100	133186.5	3.5	466652.75	600 RL
9	Section-11	496.63	1030.535	100	103053.5	3.5	360587.25	630 RL
10	Section-12	0	248.315	100	24831.5	3.5	86918.25	
		0	0	50	0	3.5	0	
					Total		1894957.75	

## Subgrade (2012-13)

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	Qty (TONS)	RL (m)
1	Section-3	0	0	50	0	2.8	0	600 RL
2	Section-4	896.16	348.08	100	34808	2.8	97462.4	600 RL
3	Section-5	938.71	817.435	100	81743.5	2.8	228881.8	600 RL
4	Section-6	297.64	618.175	100	61817.5	2.8	173089	600 RL
5	Section-7	3306.42	1802.03	100	180203	2.8	504568.4	580 RL
6	Section-8	582.14	1934.28	100	193428	2.8	541598.4	580 RL
7	Section-9	48.05	305.095	100	30509.5	2.8	85426.8	570 RL
8	Section-10	260.22	154.135	100	15413.5	2.8	43157.8	600 RL
9	Section-11	104.08	182.15	100	18215	2.8	51002	630 RL
10	Section-12	0	52.04	100	5204	2.8	14571.2	
		0	0	50	0	2.8	0	
					Total		1739757.6	

Total ROM - 1894957.75 + 1739757.6 = 3634715.35 Tons

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SERAJUDDIN

Ranjana Nayak  
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Waste (2012-13)

S.N o	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL(m)
		0	79.485	50	3974.25	2.2	8743.35	600 RL
	Section-2	158.97	79.485	100	7948.5	2.2	17486.7	600 RL
1	Section-3	0	173.65	100	17365	2.2	38181	600 RL
2	Section-4	347.1	213.15	100	21315	2.2	46893	600 RL
3	Section-5	79.2	108.61	100	10861	2.2	23894.2	600 RL
4	Section-6	138.02	187.665	100	18766.5	2.2	41284.1	600 RL
5	Section-7	237.29	118.845	100	11884.5	2.2	26101.9	600 RL
6	Section-8	0	799.475	100	79947.5	2.2	175884.5	550 RL
7	Section-9	1588.95						520 RL
			1316.615	100	131661.5	2.2	289655.3	
8	Section-10	1034.26	617.14	100	61714	2.2	13770.8	600 RL
9	Section-11	0	0	100	0	2.2	0	630 RL
10	Section-12	0	0	60	0	2.2	0	
				<b>Total</b>	<b>391432.5</b>		<b>773181.5</b>	

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RQP/BBB/084/2010-A

**FIRST YEAR MINING (2012-13)**  
**KALIMATI PIT**

**Iron ore (2012 -13)**

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			1663.375	40	66535	3.5	232872.5	
1	Section-22	3326.75	3601.11	100	360111	3.5	1260388.5	550 RL
2	Section-23	3875.47	3524.335	100	352433.5	3.5	1233517.25	540 RL
3	Section-24	3173.2	1941.63	100	194163	3.5	679570.5	540 RL
4	Section-25	710.06	355.03	50	17751.5	3.5	62100.25	550 RL
				Total	990994.00		3468479.00	

**Sub-grade (2012 -13)**

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			597.27	40	23890.8	2.8	66884.24	
1	Section-22	1194.54	883.7	100	88370	2.8	247438	550 RL
2	Section-23	672.86	288.43	100	28843	2.8	80200.4	540 RL
3	Section-24	0	0	100	0	2.8	0	540 RL
4	Section-25	0	0	50	0	2.8	0	550 RL
				Total	140903.80		394530.64	

Total ROM -3468479 + 394530.64 = 3863009.64 Tons

**Waste (2012 -13)**

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			425.09	40	17003.6	2.2	37407.92	
1	Section-22	850.18	710.875	100	71087.5	2.2	156382.5	550 RL
2	Section-23	571.57	285.785	100	28578.5	2.2	62872.7	540 RL
3	Section-24	0	205.72	100	20572	2.2	45258.4	540 RL
4	Section-25	411.44	205.72	50	10286	2.2	22629.2	550 RL
				Total	147327.80		324560.72	

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ROP/CAL/20/2903/A

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ROP/BBS/994/2810-A

For SERAJUDDIN  
5-7  
H. Managing Partner

## 15 YEAR MINING (2012-13)

## BLOCK - B

## Iron Ore (2012-13)

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL
1	Section-15	0	0	30	0	3.5	0	570 RL
2	Section-16	1437.15	718.575	100	71857.5	3.5	251501.25	580 RL
3	Section-17	360.1	180.05	100	18005.5	3.5	63018.25	560 RL
4	Section-18	23.81	11.905	30	354.15	3.5	1239.52	570 RL
5	Section-19	0	0	0	0	3.5	0	
	Total				181259.65		634458.77	

## Subgrade (2012-13)

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL
1	Section-15	39.91	19.955	30	598.65	2.8	1676.22	570 RL
2	Section-16	888.97	454.44	100	45444	2.8	127243.2	580 RL
3	Section-17	204.85	102.326	100	10232.5	2.8	28651	560 RL
4	Section-18	0	0	30	0	2.8	0	570 RL
5	Section-19	0	0	0	0	2.8	0	
	Total				109956.15		307877.22	

Total ROM = 634458.77 + 307877.22 = 942336.06 Tons

## Waste (2012-13)

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL
1	Section-15	1886.14	933.07	30	27992.1	2.2	61582.62	570 RL
2	Section-16	651.29	325.645	100	32564.5	2.2	71631.9	580 RL
3	Section-17	528.95	264.475	100	26447.5	2.2	58184.5	560 RL
4	Section-18	6.11	3.055	30	91.65	2.2	201.63	570 RL
5	Section-19	0	0	0	0	2.2	0	
	Total				229620.2		504944.55	

TOTAL WASTE = 504944.55

For SERAJUDDIN &amp; CO.

Jt. Managing Partner  
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RQP/MAB/117/98/ANihar Ranjan Nayak  
RQP/ICAL/24/1/28/3/A

5-8

Y Nagendra  
RQP/BS/09/4/2018-A

## 1ST YEAR MINING (2012-13)

## Block F1

## IRON ORE (2012 - 13)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			0	50	0	3.5	0	
1	Section-13	0	0	100	0	3.5	0	580 RL
2	Section-14	0	0	100	0	3.5	0	580 RL
3	Section-15	0	0	100	0	3.5	0	580 RL
4	Section-16	583.24	281.62	100	28162	3.5	98587	580 RL
5	Section-17	631.09	547.165	100	54716.5	3.5	191507.75	580 RL
6	Section-18	1296.72	913.905	100	91390.5	3.5	319868.75	580 RL
7	Section-19	960.9	1126.81	100	112681	3.5	395083.5	580 RL
			480.45	50	24022.5	3.5	84078.75	
					Total		1489113.75	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			0	0	0	3.5	0	
1	Section-13	0	0	0	0	3.5	0	570 RL
2	Section-14	0	0	0	0	3.5	0	570 RL
3	Section-15	0	0	0	0	3.5	0	570 RL
4	Section-16	0	0	0	0	3.5	0	570 RL
5	Section-17	0	0	0	0	3.5	0	570 RL
6	Section-18	0	0	0	0	3.5	0	570 RL
7	Section-19	879.4	439.7	50	21985	3.5	76947.5	570 RL
					Total		76947.50	

K Shankar

RQP/MAS/117/2012/A

For SERAJUDDIN  
Managing Partner

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S-9

Y Nagendra  
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## Subgrade (2012 - 13)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0	0	50	0	2.8	0	
1	Section-13	0	0	100	0	2.8	0	580 RL
2	Section-14	0	213.745	100	21374.5	2.8	59848.6	580 RL
3	Section-15	427.49	583.455	100	58345.5	2.8	163367.4	580 RL
4	Section-16	739.42	1205.065	100	120506.5	2.8	337415.2	580 RL
5	Section-17	1670.71	959.43	100	95943	2.8	268640.4	580 RL
6	Section-18	248.15	212.435	100	21243.5	2.8	59481.2	580 RL
7	Section-19	176.72	88.36	50	4418	2.8	12370.4	580 RL
				Total	321831.00		901128.80	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0	0	0	0	2.8	0	
1	Section-13	0	302.346	0	0	2.8	0	570 RL
2	Section-14	604.69	1126.835	0	0	2.8	0	570 RL
3	Section-15	1648.98	1596.27	0	0	2.8	0	570 RL
4	Section-16	1483.56	741.78	0	0	2.8	0	570 RL
5	Section-17	0	887.03	0	0	2.8	0	570 RL
6	Section-18	1774.06	975.39	0	0	2.8	0	570 RL
7	Section-19	176.72	88.36	50	4418	2.8	12370.4	570 RL
				Total	4418.00		12370.40	

Total ROM -1166051.25+913497.20 = 2079548.45 Tons

FOR SERAJUDDIN & CO.  
Jt. Managing Partner

K Shankar  
ROP/MAS/117/90/A

Nihar Ranjan Nayak  
ROP/CAL/28/2003/A

Y Nagendra  
ROP/BS/084/2010-A

## WASTE (2012 - 13)

S.N	Section No.	Sectional Area (Sq.m)	Avg. Sectional Area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remark
			0	60	0	2.2	0	
1	Section-13	0	0	100	0	2.2	0	580 RL
2	Section-14	0	0	100	0	2.2	0	580 RL
3	Section-15	0	0	100	0	2.2	0	580 RL
			143.445	100	14344.5	2.2	31557.9	
4	Section-16	286.89	143.445	100	14344.5	2.2	31557.9	580 RL
5	Section-17	0	0	100	0	2.2	0	580 RL
6	Section-18	0	658.53	100	65853	2.2	144876.6	580 RL
7	Section-19	1317.06	658.53	50	32926.5	2.2	72438.3	580 RL
				Total	127468.5		280430.7	
					0		0	

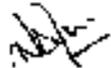
S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional Area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			0	0	0	2.2	0	
1	Section-13	0	0	0	0	2.2	0	570 RL
2	Section-14	0	0	0	0	2.2	0	570 RL
3	Section-15	54.61	27.305	0	0	2.2	0	570 RL
4	Section-16	51.79	53.2	0	0	2.2	0	570 RL
5	Section-17	279.33	165.56	0	0	2.2	0	570 RL
6	Section-18	0	139.665	0	0	2.2	0	570 RL
7	Section-19	921.8	460.75	0	0	2.2	0	570 RL
			460.75	50	23037.5	2.2	50682.5	
				Total	23037.50		50682.50	

TOTAL WASTE= 331113.20 Tons

K. Shankar

K Shankar  
RQP/MA/117/28/A

For SERAJUDDIN  
  
 Nihar Ranjan Nayak  
 RQP/CAL/291/2003/A  
 5-11  
 Jr. Managing Partner

  
 Y Nagendra  
 RQP/BBG/064/2010-A

2<sup>nd</sup> YEAR MINING (2013-14)

## BLOCK - A

## Iron ore (2013-14)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			528.21	80	26410.5	3.5	92436.75	580 RL
1	Section-3	1056.42	886.065	100	88606.5	3.5	310122.75	580 RL
2	Section-4	715.71	1200.825	100	120082.5	3.5	420288.75	590 RL
3	Section-5	1885.94	858.42	100	85842	3.5	303447	600 RL
4	Section-6	30.9	15.45	100	1545	3.5	5407.5	
5	Section-7	0	930.525	100	93052.5	3.5	325683.75	540 RL
6	Section-8	1861.05	930.525	100	93052.5	3.5	325683.75	
7	Section-9	0	267.15	100	26715	3.5	93602.5	630 RL
8	Section-10	534.3	629.46	100	62946	3.5	220311	630 RL
9	Section-11	724.62	382.31	100	38231	3.5	128808.5	
10	Section-12	0	0	50	0	3.5	0	
				Total	634483.50		222092.25	

## Subgrade (2013-14)

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			0	50	0	2.8	0	580 RL
1	Section-3	0	517.375	100	51737.5	2.8	144865	580 RL
2	Section-4	1034.75	670.32	100	67052	2.8	187745.6	590 RL
3	Section-5	106.29	1065.325	100	106532.5	2.8	298291	600 RL
4	Section-6	2024.35	1012.18	100	101218	2.8	283410.4	600 RL
5	Section-7	0	287.105	100	28710.5	2.8	80389.4	540 RL
6	Section-8	594.21	297.105	100	29710.5	2.8	83189.4	
7	Section-9	0	134.685	100	13468.5	2.8	37706.2	630 RL
8	Section-10	269.33	188.81	100	18881	2.8	52906.8	630 RL
9	Section-11	104.29	52.145	100	5214.5	2.8	14600.6	
10	Section-12	0	0	50	0	2.8	0	
				Total	413323.80		1157304.80	

Total ROM - 222092.25 + 1157304.80 = 3377996.85 Tons

For SERAJUDDIN & CO.

Jl. Managing Partner

K Shankar  
ROP/MAS/117/2014

Nihar Ranjan Nayak  
ROP/CAJ/291/2013/A

Y Nagendra  
ROP/BSB/004/2010-A





Waste (2013 -14)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL
			83.775	30	2513.25	2.2	5528.15	
1	Section-15	167.55						570 RL
			111.115	100	11111.5	2.2	24445.3	
2	Section-16	54.88						560 RL
			27.34	100	2734	2.2	6014.8	
3	Section-17	0						550 RL
			360.765	100	36076.5	2.2	79368.3	
4	Section-18	721.53						570 RL
			360.765	30	10822.95	2.2	23810.49	
5	Section-19	0						
			0	0	0	2.2	0	
				Total	63258.20		139168.04	

TOTAL WASTE= 139168.04

GETTING APPROVED

K Shankar  
RQP/MAS/17/88/A

Nihar Rajan Nayak  
RQP/CAL/21/2003/A

Y Negendra  
RQP/BB8/084/2010-A

For SERAJUDDIN & Co.  
J.I. Managing Partner

## 2ND YEAR MINING (2013-14)

## Block E1

Iron ore (2013-14)

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remark
			0	0	0	3.5	0	
1	Section-13	0	733.125	0	0	3.5	0	560 RL
2	Section-14	1488.25	1472.565	0	0	3.5	0	560 RL
3	Section-15	1478.88	1272.455	0	0	3.5	0	560 RL
4	Section-16	1066.03	1784.765	100	178476.5	3.5	624667.75	560 RL
5	Section-17	2503.5	1917.82	100	191782	3.5	671187	560 RL
6	Section-18	1331.74	1229.415	100	122941.5	3.5	430295.25	560 RL
7	Section-19	1127.09	563.545	50	28177.25	3.5	98620.375	560 RL
				Total	521357.25		1424750.38	

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remark
			0	50	0	3.5	0	
1	Section-13	0	127.555	100	12755.5	3.5	44644.25	570 RL
2	Section-14	255.11	532.605	100	53260.5	3.5	186411.75	570 RL
3	Section-15	810.1	881.785	100	88178.5	3.5	312124.75	570 RL
4	Section-16	973.47	1724.915	100	172491.5	3.5	603720.25	570 RL
5	Section-17	2476.38	1889.595	100	188959.5	3.5	661358.25	570 RL
6	Section-18	1302.83	1091.115	100	109111.5	3.5	381890.25	570 RL
7	Section-19	879.4	439.7	0	0	3.5	0	570 RL
				Total	625757.00		2190149.50	

For SERAJUDDIN &amp; CO.

Jt. Managing Partner

  
 K Shankar  
 RGP/MAS/117/2010/A

  
 Nihar Ranjan Nayak  
 RGP/CAL/291/2003/A

  
 Y Nagendra  
 RGP/BBB/094/2010-A

## Subgrade (2013-14)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
1	Section-13	917.36	458.68	0	0	2.8	0	560 RL
2	Section-14	1347.35	1132.355	0	0	2.8	0	560 RL
3	Section-15	707.28	1027.315	0	0	2.8	0	560 RL
4	Section-16	1153.64	830.56	0	0	2.8	0	560 RL
5	Section-17	0	576.92	100	57692	2.8	161537.6	560 RL
6	Section-18	2059.32	1029.66	100	102966	2.8	288304.8	560 RL
7	Section-19	927.82	1493.47	100	149347	2.8	418171.6	560 RL
			463.81	50	23190.5	2.8	64933.4	
				Total	333195.50		932947.40	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
1	Section-13	0	0	50	0	2.8	0	570 RL
2	Section-14	604.69	302.345	100	30234.5	2.8	84656.6	570 RL
3	Section-15	1648.98	1128.635	100	112683.5	2.8	315513.8	570 RL
4	Section-16	1483.56	1566.27	100	156627	2.8	438555.6	570 RL
5	Section-17	0	741.78	100	74178	2.8	207688.4	570 RL
6	Section-18	1774.06	887.03	100	88703	2.8	248388.4	570 RL
7	Section-19	176.72	975.39	100	97539	2.8	273109.2	570 RL
			88.36	0	0	2.8	0	
				Total	559955.00		1567902.00	

Total ROM = 6515749.28

Total ROM -4014899.88+2500849.40 = 6515749.28 Tons

K Shankar  
ROP/MS/117/88/A

For SERAJUDIN & NIKHAR Ranjan Nayak  
ROP/CAL/251/2003/A  
3-17  
Jl. Managing Partner

Y Nagendra  
ROP/888/064/2010-A

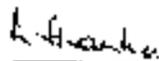
## Waste (2013-14)

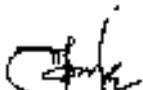
S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
1	Section-13	182.67	91.335	0	0	2.2		560 RL
2	Section-14	0	91.335	0	0	2.2	0	560 RL
3	Section-15	362.03	181.015	0	0	2.2	0	560 RL
4	Section-16	51.96	206.885	0	0	2.2	0	560 RL
5	Section-17	564.17	308.085	100	30808.5	2.2	67774.3	560 RL
6	Section-18	212.34	388.255	100	38825.5	2.2	85416.1	560 RL
7	Section-19	1233.75	723.045	100	72304.5	2.2	159069.9	560 RL
			818.875	50	30843.75	2.2	67856.25	560 RL
				Total	172780.25		388116.55	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
1	Section-13	0	0	50	0	2.2	0	570 RL
2	Section-14	0	0	100	0	2.2	0	570 RL
3	Section-15	54.61	27.305	100	2730.5	2.2	6007.1	570 RL
4	Section-16	51.79	53.2	100	5320	2.2	11704	570 RL
5	Section-17	279.33	165.56	100	16556	2.2	36423.2	570 RL
6	Section-18	0	138.885	100	13888.5	2.2	30726.3	570 RL
7	Section-19	921.5	460.75	100	46075	2.2	101365	570 RL
			460.75	0	0	2.2	0	570 RL
				Total	84649.00		198225.60	

TOTAL WASTE= 586342.15

For SERAJUDDIN & CO.  
  
 Managing Partner

  
 K Shankar  
 RQP/MA9/117/98A

  
 Nihar Ranjan Nayak  
 RQPICAL/2/1/2903/A

  
 Y Nagendra  
 RQP/888/094/2610-A

**3RD YEAR MINING (2014-15)**  
**BLOCK - A**

**Iron Ore (2014-15)**

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
1	Section-3	988.45	1048.285	100	104828.5	3.5	366899.75	570 RL
2	Section-4	1128.12	1804.976	100	180497.6	3.5	631741.25	570 RL
3	Section-5	2481.83	1878.5	100	187850	3.5	656775	580 RL
4	Section-6	871.17	1578.85	100	157885	3.5	551477.5	580 RL
5	Section-7	2280.13	1800.075	100	180007.5	3.5	630026.25	570 RL
6	Section-8	1320.02	1588.265	100	158826.5	3.5	554842.75	540 RL
7	Section-9	1860.61	2827.75	100	282775	3.5	989712.5	
8	Section-10	3804.99	1902.495	100	190249.5	3.5	665873.25	580 RL
9	Section-11	0	0	100	0	3.5	0	
10	Section-12	0	0	50	0			
				Total	1448310.75		486209.63	

**Subgrade (2014-15)**

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
1	Section-3	0	0	50	0	2.8	0	570 RL
2	Section-4	311.83	273.2	100	27320	2.8	76496	570 RL
3	Section-5	234.67	1101.415	100	110141.5	2.8	308396.2	580 RL
4	Section-6	1968.28	2545.83	100	254583	2.8	712852.4	580 RL
5	Section-7	3123.4	1775.19	100	177519	2.8	497053.2	570 RL
6	Section-8	428.98	221.58	100	22158	2.8	62045.2	540 RL
7	Section-9	16.2	5487.5	100	5487.5	2.8	15369	
8	Section-10	93.15	4657.5	100	4657.5	2.8	13041	580 RL
9	Section-11	0	0	100	0	2.8	0	
10	Section-12	0	0	50	0	2.8	0	
				Total	817438		1728829.2	

Total ROM - 5062087.93 + 1728829.20 = 6790916.83 Tons

K Shankar  
RQP/MAS/17/08/A

Nihar Ranjan Nayak  
RQP/CA/20/2003/A

Y Nagendra  
RQP/BB/09/2010-A

For SERAJUDDIN & CO.  
5-19  
Jt. Managing Partner



3rd YEAR MINING (2014-15)  
Block F1

## Iron ore (2014-15)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			0	50	0	3.5	0	
1	Section-13	0	733.125	100	73312.5	3.5	256593.75	560 RL
2	Section-14	1486.25	1472.565	100	147256.5	3.5	515397.75	560 RL
3	Section-15	1478.88	1272.455	100	127245.5	3.5	445359.25	560 RL
4	Section-16	1066.03	1784.765	0	0	3.5	0	560 RL
5	Section-17	2603.5	1917.82	0	0	3.5	0	560 RL
6	Section-18	1331.74	1228.415	0	0	3.5	0	560 RL
7	Section-19	1127.09	563.545	0	0	3.5	0	560 RL
				Total	347814.50		1217350.75	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			567.465	0	0	3.5	0	
1	Section-13	1114.93	1497.98	0	0	3.5	0	550 RL
2	Section-14	1681.03	2055.705	0	0	3.5	0	550 RL
3	Section-15	2230.38	2361.91	100	236191	3.5	828668.5	550 RL
4	Section-16	2493.44	2360.645	100	236064.5	3.5	828225.75	550 RL
5	Section-17	2227.85	2453.4	100	245340	3.5	858690	550 RL
6	Section-18	2676.95	2011.165	100	201116.5	3.5	703907.75	550 RL
7	Section-19	1343.38	671.69	50	33584.5	3.5	117545.75	550 RL
				Total	952296.50		3333037.75	

K Shankar  
RQP/MA2/117/08/A

Nihar Ranjan Nayak  
RQP/CAL/2012/003/A  
S-21  
Jt. Managing Partner

Y Nagendra  
RQP/BS/894/2010-A

## Subgrade (2014-15)

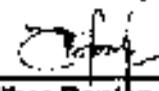
S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
			458.68	50	22934	2.8	64215.2	
1	Section-13	917.36						550 RL
			1132.355	100	113235.5	2.8	317069.4	
2	Section-14	1347.35						550 RL
			1027.315	100	102731.5	2.8	287648.2	
3	Section-15	707.28						550 RL
			930.68	100	93068	2.8	260558.8	
4	Section-16	1153.84						550 RL
			576.92	0	0	2.8	0	
5	Section-17	0						550 RL
			1029.68	0	0	2.8	0	
6	Section-18	2059.32						550 RL
			1493.47	0	0	2.8	0	
7	Section-19	927.62						550 RL
			463.81	0	0	2.8	0	
				Total	331957.00		929476.68	

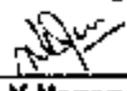
S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
			487.48	0	0	2.8	0	
1	Section-13	974.86						550 RL
			487.48	0	0	2.8	0	
2	Section-14	0						550 RL
			270.135	0	0	2.8	0	
3	Section-15	540.27						550 RL
			410.715	100	41071.5	2.8	115000.2	
4	Section-16	251.18						550 RL
			181.355	100	18135.5	2.8	50779.4	
5	Section-17	81.55						550 RL
			304.385	100	30438.5	2.8	85227.8	
6	Section-18	527.22						550 RL
			636.9	100	63690	2.8	178332	
7	Section-19	748.58						550 RL
			373.29	50	18664.5	2.8	52280.6	
				Total	172056.00		481900.00	

Total ROM = 4550388.90 + 1411079.68 = 5961468.58 Tons

For SERAJUDDIN & CO.  
  
 Managing Partner

K Shankar  
RQP/MAS/117/S&A

  
 Nihar Ranjan Nayak  
RQP/CAL/281/2003/A

  
 Y Nagendra  
RQP/ISS/094/2018-A

Waste (2014-15)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			91.335	50	4566.75	2.2	10046.85	
1	Section-13	182.67						560 RL
			91.335	100	8133.5	2.2	20093.7	
2	Section-14	0						560 RL
			181.015	100	18101.5	2.2	39823.3	
3	Section-15	362.03						560 RL
			206.995	100	20699.5	2.2	45538.9	
4	Section-16	51.88						560 RL
			308.065	0	0	2.2	0	
5	Section-17	564.17						560 RL
			388.255	0	0	2.2	0	
6	Section-18	212.34						560 RL
			723.045	0	0		0	
7	Section-19	1233.75						560 RL
			816.875	0	0	2.2	0	
				Total	52501.25		115502.78	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			0	0	0	2.2	0	
1	Section-13	0						550 RL
			885.01	0	0	2.2	0	
2	Section-14	1380.02						560 RL
			376.025	0	0	2.2	0	
3	Section-15	362.03						550 RL
			485.536	180	48553.5	2.2	109817.7	
4	Section-16	809.04						550 RL
			304.52	180	30452	2.2	66884.4	
5	Section-17	0						550 RL
			188.87	100	18887	2.2	23807.4	
6	Section-18	217.34						550 RL
			562.255	180	56225.5	2.2	123688.1	
7	Section-19	987.17						560 RL
			453.985	50	22679.25	2.2	49894.35	
				Total	168777.25		371308.95	

TOTAL WASTE=496812.70

K Shankar

RQP/MAS/11/7/98/A

Nihar Ranjan Nayak  
RQP/CAL/26/1/2003/A

For SERAJUDDIN &amp; CO.

Jt. Managing Partner

Y Nagendra

RQP/BSS/09/4/2010-A

## 4th YEAR MINING (2015-16)

## BLOCK - A

## Iron ore (2015-16)

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			829.245	50	41462.25	3.5	145117.875	560 RL
1	Section-3	1658.49						560 RL
			1586.095	100	158609.5	3.5	555133.25	560 RL
2	Section-4	1513.7						560 RL
			2063.925	100	206392.5	3.5	722373.75	560 RL
3	Section-5	2614.15						560 RL
			2160.33	100	216033	3.5	756115.5	560 RL
4	Section-6	1706.51						560 RL
			2739.545	100	273954.5	3.5	958840.75	560 RL
5	Section-7	3772.58						550 RL
			2602.795	100	260279.5	3.5	910978.25	550 RL
6	Section-8	1433.01						550 RL
			2107.905	100	210790.5	3.5	737826.75	550 RL
7	Section-9	2782						540 RL
			1361	100	136100	3.5	476350	540 RL
8	Section-10	0						540 RL
			2441.705	100	244170.5	3.5	854596.75	540 RL
9	Section-11	4883.41						510 RL
			2441.705	100	244170.5	3.5	854596.75	510 RL
10	Section-12	0						510 RL
			0	50	0	3.5	0	510 RL
				Total	1894922.75		6682229.63	

## Subgrade (2015-16)

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			0	50	0	2.8	0	560 RL
1	Section-3	0						560 RL
			0	100	0	2.8	0	560 RL
2	Section-4	0						560 RL
			535.07	100	53507	2.8	149819.6	560 RL
3	Section-5	1070.14						560 RL
			1104.74	100	110474	2.8	309327.2	560 RL
4	Section-6	1139.34						560 RL
			854.18	100	85418	2.8	239170.4	560 RL
5	Section-7	669.02						550 RL
			708.67	100	70867	2.8	198427.6	550 RL
6	Section-8	848.32						550 RL
			424.18	100	42418	2.8	118784.8	550 RL
7	Section-9	0						540 RL
			0	100	0	2.8	0	540 RL
8	Section-10	0						540 RL
			148.285	100	14828.5	2.8	41514.2	540 RL
9	Section-11	296.63						510 RL
			148.285	100	14828.5	2.8	41514.2	510 RL
10	Section-12	0						510 RL
			0	50	0	2.8	0	510 RL
				Total	302335.00		1098538.00	

Total ROM = 6682229.63 + 1098538.00 = 8080767.63 Tons

For SERAJUDDIN &amp; CO.

Jt. Managing Director

K Shankar  
RQP/MAS/117/98/ANihar Ranjan Nayak  
RQP/CAL/201/2083/AY Nagendra  
RQP/BS/024/2010-A

## Waste (2015-16)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
		0						
			321.94	50	16097	2.2	35413.4	
	Section-2	643.86						550 RL
			321.94	100	32194	2.2	70826.8	
1	Section-3	0						660 RL
			107.825	100	10782.5	2.2	23721.5	
2	Section-4	215.85						560 RL
			1215.99	100	121599	2.2	267517.8	
3	Section-5	2218.33						580 RL
			1427.86	100	142786	2.2	314129.2	
4	Section-6	639.39						580 RL
			378.15	100	37815	2.2	83193	
5	Section-7	118.91						550 RL
			76.315	100	7631.5	2.2	16789.3	
8	Section-8	35.72						550 RL
			17.86	100	1786	2.2	3929.2	
7	Section-9	0						640 RL
			0	100	0	2.2	0	
6	Section-10	0						
			26.365	100	2636.5	2.2	5800.3	
9	Section-11	62.73						610 RL
			26.365	100	2636.5	2.2	5800.3	
10	Section-12	0						
			0	50	0	2.2	0	
				Total	398867.06		791787.40	

K. Shankar

K Shankar  
ROP/MAS/17/88/A

Nihar Ranjan Nayak

ROP/CA/20/2082/A

Y Nagendra

ROP/BB/094/2010-A

For SERAJUDDIN &amp; CO.

Jt. Managing Partner

## 4th YEAR MINING (2015-16)

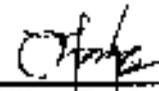
## Block F1

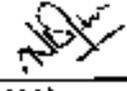
Iron ore (2015-16)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			779.99	0	0	3.5	0	
1	Section-13	1559.86	1680.815	50	84040.75	3.5	294142.625	540 RL
2	Section-14	1801.85						540 RL
3	Section-15	2796.08	2298.805	100	229886.5	3.5	804602.75	540 RL
			2646.17	100	264617	3.5	926158.5	
4	Section-15	2496.26						540 RL
			2280.635	100	228063.5	3.5	798222.25	
5	Section-17	2065.01						540 RL
			2574.08	100	257408	3.5	900921	
6	Section-18	3083.11						540 RL
			2463.815	100	246381.5	3.5	862335.25	
7	Section-19	1844.52						540 RL
			922.26	50	46113	3.5	161385.5	
				Total	1358596.25		4747776.88	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			557.485	50	27873.25	3.5	97556.375	
1	Section-13	1114.93						550 RL
			1497.88	100	149798	3.5	524293	
2	Section-14	1881.03						550 RL
			2055.705	100	205570.5	3.5	719496.75	
3	Section-15	2230.38						550 RL
			2381.91	0	0	3.5	0	
4	Section-16	2493.44						550 RL
			2380.645	0	0	3.5	0	
5	Section-17	2227.86						550 RL
			2453.4	0		3.5	0	
6	Section-18	2078.85						550 RL
			2011.165	0		3.5	0	
7	Section-19	1343.38						550 RL
			671.69	0	0	3.5	0	
				Total	383241.75		1341346.13	

For SERAJUDDIN & CO.  
  
 K Shankar  
 Jt. Managing Partner  
 RQP/MASH/117/88/A

  
 Nihar Ranjan Nayak  
 RQP/CA/291/2003/A

  
 Y Nagendra  
 RQP/SS/894/2010-A

Sub grade (2015-16)

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TDNS)	Remarks
		0						
			231.1	0	0	2.8	0	
1	Section-13	462.2						540 RL
			729.19	50	36459.5	2.8	102086.6	
2	Section-14	998.18						540 RL
			716.655	100	71885.5	2.8	201279.4	
3	Section-15	441.53						540 RL
			466.14	100	46614	2.8	130519.2	
4	Section-16	490.76						540 RL
			293.51	100	29351	2.8	82162.8	
5	Section-17	96.27						540 RL
			48.135	100	4813.5	2.8	13477.8	
6	Section-18	0						540 RL
			122.885	100	12288.5	2.8	34407.8	
7	Section-19	246.77						540 RL
			122.885	50	6144.25	2.8	17203.9	
				Total	267569.25		661157.50	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
			487.48	50	24374	2.8	68247.2	
1	Section-13	974.96						550 RL
			487.48	100	48748	2.8	136494.4	
2	Section-14	0						550 RL
			270.135	100	27013.5	2.8	75637.8	
3	Section-15	540.27						550 RL
			410.715	0	0	2.8	0	
4	Section-16	281.16						550 RL
			181.356	0	0	2.8	0	
5	Section-17	81.55						550 RL
			304.385	0	0	2.8	0	
6	Section-18	627.22						550 RL
			636.9	0	0	2.8	0	
7	Section-19	746.58						550 RL
			373.29	0	0	2.8	0	
				Total	100135.50		290378.40	

Total ROM = 6089125.00+881536.90 = 6970661.90 Tons

K Shankar  
RQP/MA3/117/2016-A

Nihar Ranjan Nayak  
RQP/CA2/23/2003/A

Y Nagendra  
RQP/BB3/094/2016-A

For SERAJUDIN  
5-27  
Jt. Managing Partner

Waste (2015-16)

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			404.405	0	0	2.2	0	
1	Section-13	808.81						540 RL
			472.28	50	23614.5	2.2	51951.9	
2	Section-14	135.77						540 RL
			100.29	100	10029	2.2	22063.8	
3	Section-15	84.81						540 RL
			113.885	100	11389.5	2.2	25078.9	
4	Section-16	169.18						540 RL
			210.705	100	21070.5	2.2	46355.1	
6	Section-17	258.23						540 RL
			129.115	100	12911.5	2.2	28405.3	
8	Section-18	0						540 RL
			283.585	100	28358.5	2.2	62388.7	
7	Section-19	587.17						540 RL
			283.585	50	14179.25	2.2	31184.35	
				Total	121562.75		267438.05	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			0	50	0	2.2	0	
1	Section-13	0						550 RL
			695.01	100	69501	2.2	152902.2	
2	Section-14	1390.02						550 RL
			876.025	100	87602.5	2.2	192725.5	
3	Section-15	362.03						550 RL
			485.535	0	0	2.2	0	
4	Section-16	808.04						550 RL
			304.52	0	0	2.2	0	
5	Section-17	0						550 RL
			108.67	0	0	2.2	0	
6	Section-18	217.34						550 RL
			582.255	0	0	2.2	0	
7	Section-19	907.17						550 RL
			453.685	0	0	2.2	0	
				Total	157183.68		346827.79	

TOTAL WASTE= 613065.75

For SERAJUDDIN &amp; CO.

Jt. Managing Partner  
K Shankar

RQP/MAS/117/01/A

Nihar Ranjan Nayak  
RQP/CAU/291/2003/A

S-28

Y Nagendra  
RQP/BBB/094/2010-A

**5th YEAR MINING (2016-17)**  
**BLOCK - A**

**Iron ore (2016-17)**

S.No	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			1681.08	80	83054	3.5	290889	
1	Section-3	3322.18						530 RL
			3234.655	100	323465.5	3.5	1132129.25	
2	Section-4	3147.15						530 RL
			4379.695	100	437969.5	3.5	1532893.25	
3	Section-5	5812.24						530 RL
			4144.095	100	414409.5	3.5	1450433.25	
4	Section-6	2875.95						530 RL
			2887.275	100	288727.5	3.5	1010546.25	
5	Section-7	3098.6						530 RL
			1998.3	100	199830	3.5	699405	
6	Section-8	898						530 RL
			1281.95	100	128195	3.5	447682.5	
7	Section-9	1825.9						540 RL
			1794.88	100	179488	3.5	628208	
8	Section-10	1963.88						570 RL
			981.93	100	98193	3.5	343875.6	
9	Section-11	0						610 RL
			212.94	100	21294	3.5	74529	
10	Section-12	425.88						640 RL
			212.94	25	5323.5	3.5	18632.25	
				Total	2177949.50		7822823.25	

**Subgrade (2016-17)**

S.No.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			0	50	0	2.8	0	
1	Section-3	0						530 RL
			0	100	0	2.8	0	
2	Section-4	0						530 RL
			0	100	0	2.8	0	
3	Section-5	0						530 RL
			23.44	100	2344	2.8	6563.2	
4	Section-6	48.88						530 RL
			23.44	100	2344	2.8	6563.2	
5	Section-7	0						530 RL
			8.5	100	850	2.8	2380	
6	Section-8	17						530 RL
			313.625	100	31362.5	2.8	87815	
7	Section-9	610.25						540 RL
			305.125	100	30512.5	2.8	85435	
8	Section-10	0						570 RL
			0	100	0	2.8	0	
9	Section-11	0						610 RL
			317.68	100	31768	2.8	88960.4	
10	Section-12	835.38						840 RL
			317.68	25	7942	2.8	22237.6	
				Total	107123		299944.40	

Total ROM - 7822823.25 + 299944.40 = 7822767.85 Tons

*K Shankar*  
K Shankar  
ROP/IAS/117/D/A

*Nihar Ranjan Nayak*  
Nihar Ranjan Nayak  
ROP/CAL/291/2003/A

*Y Nagendra*  
Y Nagendra  
ROP/IBS/094/2010-A

For SERAJUDIN & CO.

*Jt. Managing Partner*  
Jt. Managing Partner

## Waste(2016-17)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	RL (m)
			0	50	0	2.2	0	530 RL
1	Section-3	0	0	100	0	2.2	0	530 RL
2	Section-4	0	343.57	100	34357	2.2	75585.4	530 RL
3	Section-5	687.14	493.15	100	49315	2.2	108493	530 RL
4	Section-6	299.16	149.58	100	14958	2.2	32907.6	530 RL
5	Section-7	0	0	100	0	2.2	0	530 RL
6	Section-8	0	65	100	6500	2.2	14300	530 RL
7	Section-9	130	65	100	6500	2.2	14300	540 RL
8	Section-10	0	0	100	0	2.2	0	570 RL
9	Section-11	0	253.7	100	25370	2.2	55814	610 RL
10	Section-12	507.4	253.7	30	7611	2.2	16744.2	640 RL
				Total	144811		316144.20	

For SERAJUDDIN & CO.

Jl. Mangging Partner.

K Shankar  
RQP/MAS/117/98/A

Nihar Ranjan Nayak  
RQP/CAL/21/2008/A

Y Nagendra  
RQP/BS/104/2010-A

5th YEAR MINING (2016-17)  
Block F1

Iron Ore (2016-17)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			779.99	50	38999.5	3.5	136498.25	
1	Section-13	1559.99	1680.815	60	84049.75	3.5	294142.625	540 RL
2	Section-14	1801.65						540 RL
3	Section-15	2796.08	2288.865	0	0	3.5	0	540 RL
4	Section-16	2496.26	2646.17	0	0	3.5	0	540 RL
5	Section-17	2065.01	2280.635	0	0	3.5	0	540 RL
6	Section-18	0	1032.505	0	0	3.5	0	540 RL
7	Section-19	1844.52	922.26	0	0	3.5	0	540 RL
			922.26	0	0	3.5	0	
				Total	123049.25		430649.88	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional Influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
			1003.775	60	50188.75	3.5	175660.625	
1	Section-13	2007.55	1958.025	100	195802.5	3.5	685308.75	530 RL
2	Section-14	1908.5	2410.195	100	241019.5	3.5	843568.25	530 RL
3	Section-15	2911.89	2716.795	100	271579.5	3.5	950528.25	530 RL
4	Section-16	2519.7	2237.815	100	223781.5	3.5	783235.25	530 RL
5	Section-17	1955.93	2349.52	100	234952	3.5	822332	530 RL
6	Section-18	2743.11	3388.16	100	338816	3.5	1195856	530 RL
7	Section-19	4033.21	2016.605	50	100830.25	3.5	352905.875	520 RL
				Total	1656970.00		5799395.00	

K Shankar  
ROP/MAS/11788/A

Nihar Ranjan Nayak  
ROP/MAS/11788/A

Y Nagendra  
ROP/BGS/094/2010-A

For SERAJUDDIN & Co.  
5-31  
Jt. Managing Partner

## Subgrade (2016-17)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
			231.1	50	11555	2.8	32354	
1	Section-13	462.2						540 RL
			729.19	50	38459.5	2.8	102088.6	
2	Section-14	996.18						540 RL
			718.865	0	0	2.8	0	
3	Section-15	441.53						540 RL
			466.14	0	0	2.8	0	
4	Section-16	490.75						540 RL
			293.61	0	0	2.8	0	
5	Section-17	96.27						540 RL
			48.135	0	0	2.8	0	
6	Section-18	0						540 RL
			122.885	0	0	2.8	0	
7	Section-19	245.77						540 RL
			122.885	0	0	2.8	0	
				Total	48914.50		134440.80	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
		0						
			1599.5	50	79975	2.8	223930	
1	Section-13	3198						530 RL
			1842.555	100	184255.5	2.8	518915.4	
2	Section-14	488.11						530 RL
			288.32	100	28832	2.8	75129.6	
3	Section-15	50.53						530 RL
			107.08	100	10708	2.8	29982.4	
4	Section-16	163.63						530 RL L
			81.815	100	8181.5	2.8	22908.2	
5	Section-17	0						530 RL
			0	100	0	2.8	0	
6	Section-18	0						530 RL
			0	100	0	2.8	0	
7	Section-19	0						520 RL
			0	50	0	2.8	0	
				Total	309952.08		877055.00	

Total ROM = 223930.80 + 102302.20 = 326233.00 Tons

FOR SERAJUDDIN & CO.  
Jr. Managing

K Shankar  
RQP/MS/117/98/A

Nihar Ranjan Nayak  
RQP/CAU/29/12003/A

Y Nagendra  
RQP/BS/194/2010-A

## Waste (2016-17)

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
1	Section-13	808.81	404.405	50	20220.25	2.2	44484.55	540 RL
2	Section-14	135.77	472.29	60	23614.5	2.2	51951.9	540 RL
3	Section-15	64.81	100.29	0	0	2.2	0	540 RL
4	Section-16	163.18	113.995	0	0	2.2	0	540 RL
5	Section-17	258.23	210.705	0	0	2.2	0	540 RL
6	Section-18	0	129.115	0	0	2.2	0	540 RL
7	Section-19	587.17	283.585	0	0	2.2	0	540 RL
			283.585	0	0	2.2	0	
				Total	43834.75		95438.45	

S.N.	Section No.	Sectional Area (Sq.m)	Avg. Sectional area (Sq.m)	Sectional influence (m)	Volume (Cu.m)	TCF	QTY (TONS)	Remarks
1	Section-13	533.87	268.935	50	13348.75	2.2	29382.85	530 RL
2	Section-14	199	366.435	100	36643.5	2.2	80615.7	530 RL
3	Section-15	0	99.5	100	9950	2.2	21890	530 RL
4	Section-16	127.96	63.98	100	6398	2.2	14075.6	530 RL
5	Section-17	123.08	125.52	100	12552	2.2	27614.4	530 RL
6	Section-18	0	61.54	100	6154	2.2	13538.8	530 RL
7	Section-19	201.04	100.52	100	10052	2.2	22114.4	520 RL
			100.52	60	5026	2.2	11057.2	
				Total	100122.25		226268.95	

TOTALWASTE= 316705.40

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For SERAJUDDIN & CO.  
Jt. Managing Partner

**Balda Block Iron Mines Scheme of Mining 2012-17 Chapter - 5**

**Year-wise excavation during the scheme period i.e 2012-13 to 2016-17**

All figures in Tons

Year	Block-A			Block-B			Block-C			Mettur PR				Year wise Total				
	ROM	Waste	Remnant Resources	ROM	Waste	Remnant Resources	ROM	Waste	Remnant Resources	ROM	Waste	Remnant Resources	ROM	Waste	Remnant Resources	ROM	Waste	Remnant Resources
2012-13	3634715	773132	113581453	942286	504645	87548625	2078546	531113	80418251	3863010	324561	7930292	10519859	1933790	269041440			
2013-14	3377997	358832	110203455	1870825	139188	65677800	6515748	588342	53900502	0	0		11764571	1075442	296276659			
2014-15	6780815	771086	103412540	0.00	0.00		5881488	468813	47938034	0.00	0.00		12792385	1267801	243524484			
2015-16	8080768	791707	85331772	0	0		8850862	813066	40986372	0	0		18031430	1404773	228483064			
2016-17	7822788	318144	67408004	0	0		7232842	316705	33756030	0	0		16135110	634858	213337844			
Total	28807164	3024020		2813111	644113		28739788	2314038		3863010	324881		65223055	6008736				

**Year-wise dump workings and ROM production during the scheme period i.e 2012-13 to 2016-17**

S.No.	Year	Dump quantity in MTPA	Location of Dumps to be worked	Production(ROM) from Mines in MTPA	TOTAL In MTPA
1	2012-13	1.0	Dump 2 & 3	10.52	11.52
2	2013-14	1.0	Dump 1	11.76	12.76
3	2014-15	1.0	Dump 3	12.75	13.75
4	2015-16	-		15.03	15.03
5	2016-17	-		15.15	15.15
Total		3.0		65.22	68.22

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Year wise with materials OB, ROM, Saleable Ore, Sub grade Ore, Ore to OB ratio are as follows:

S.No	Year	1 OB/ Waste (Tons)	2 ROM (Tons)	3 Dump Working (Tons)	4 Total Handling (Tons)	5 Sub grade (Tons)			6 Saleable Ore (Tons)				Ore : Waste (Tons)
						Sub grade (Tons) From Dump	Dump Working (Tons)	Total (Tons)	Ore (Tons) (From ROM)	From Sub grade (Tons) (From ROM)	From Dump working (Tons)	Total (Tons)	
1	2012-13	1832770	10519555	1000000	11519555	3355660	1000000	4355660	7163885	3355660	750000	11289535	1 : 0.16
2	2013-14	1075442	11764589	1000000	12764589	4030572	1000000	5030572	7733987	4030572	750000	12514559	1 : 0.08
3	2014-15	1267901	12752382	1000000	13752382	3138806	1000000	4138808	9812474	3138808	750000	13502382	1 : 0.10
4	2015-16	1404773	15049587	0	15049587	1978234	0	1978234	13871353	1978234	0	15049587	1 : 0.009
5	2016-17	634850	15155107	0	15155107	1302249	0	1302249	13852868	1302249	0	15155107	1 : 0.04
6	TOTAL	5366736	59241266	3000000	68241266	13408623	3000000	16808623	51434577	10354968	2250000	67491260	1 : 0.10

The blending is approximately in the ratio of 1 part of Dump recovered material to 2/3 parts of High grade material i.e 1 : 2 to 1 : 3 depending on the grade.

श्री विपिन कुमार (अधीक्षक)  
 Controller of Mines, Balda Block, Iron Mines,  
 भारतीय खनिज विभाग  
 Indian Dept. of Mines

*(Signature)*  
 27/11/17

*(Signature)*  
 K Shankar  
 ROP/MAB/11788/A

*(Signature)*  
 Nihar Ranjan Nayak  
 ROP/MAB/29112003/A

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 Managing Partner

Some of the old waste dumps are lying in the mineralized zone were analyzed and is found to contain iron ore, which will be screened to recover iron ore with Fe % about 58%. This recovered iron ore shall be blended with ore of +60 % Fe and marketed. This is because of the fact the old waste dumps had material of less than 55% Fe which was hitherto considered as waste. The same will be now recovered by screening. The analysis results of the dumps to substantiate the same is enclosed as Annexure -11 A

Hence in addition to the ROM planned, screening of the old dumps will also yield saleable material. Therefore it is planned to re-handle all the sub grade dumps within mineralized zone by installing more screening plants in the lease area. The details of dumps proposed to be re-handled are as follows.

DIMENSIONS OF EXISTING DUMP									
S.N	DUMP	MATERIAL	LOCATION	LENGTH (m)	WIDTH (m)	HEIGHT (m)	VOLUME (Cu. m)	TCF	TONNAGE
1	DUMP - 1	SUB GRADE	PIT-1	246	180	25	1107000.00	2	2.21
2	DUMP - 2	SUB GRADE	PIT-5	103	178	18	330012.00	2	0.66
3	DUMP - 3	SUB GRADE	OFFICE	248	323	14	1121456.00	2	2.24
4	DUMP - 4	SUB GRADE	WORKSHOP	115	120	14	193200.00	2	0.39
5	DUMP - 5	WASTE	HATHI PIT	216	183	26	915408.00	2	1.83
6	DUMP - 6	WASTE	PIT-6	380	141	25	1339500.00	2	2.68

NOTE: Dump 1, 3 and 4 which were earlier considered as waste dumps and are now considered as sub grade dumps based on the revised threshold limit set by IBM

S.No	DUMP	MATERIAL	LOCATION	LENGTH (m)	WIDTH (m)	HEIGHT (m)	VOLUME (Cu. m)	TCF	TONNAGE
1	STOCK-1	SCREEN FINES	PIT-1	184	105	20	386400.00	2	0.77
2	STOCK-2	SCREEN FINES	STORE	117	59	11	75933.00	2	0.15
3	STOCK-3	CRUSHED FINES	QUARRY-4	121	111	16	214896.00	2	0.43

For M. RAJUDDIN & CO.  
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**Drilling**

The proposed mining will have 10m height benches and will be drilled for blast holes by 102 mm diameter crawler mounted pneumatic drills fed by compressed air and Sandvik DP 1100 hydraulic drills will be used.

D = Diameter of the blast hole	=	102 mm
H = Height of the bench	=	10m
S = Sub-grade drilling (10% of the bench height)	=	1.0m
L = Length of the hole	=	10 + 1m = 11m
B = Burden	=	3.0m
S = Spacing	=	3.5m
V = Volume of earth to be Broken / loosen per hole	=	$B \times S \times D \times B.D$ $10 \times 3.5 \times 3.0 \times 3.5 = 404 \text{ T}$

Where B- Burden, S- Spacing, D- depth of Hole, B.D- Bulk Density

**Meterage of Drilling per year**

Qty of excavation	=	16796210 T
Out of the total excavation only 80 % of the material needs drilling & blasting. The rest of the iron ore is amenable to direct excavation by excavators		
Volume of material needing drilling	=	13436968 T
Number of holes to be drilled	=	$13436968 / 404$ = 33260 nos
Meterage of drilling required	=	$33260 \times 11$ = 365860 m.

**Meterage of Drilling per Drill****Hydraulic Drill**

Speed of the drill (Hydraulic drill)	=	30m/hr
No. of working days in a year	=	300 days
Availability	=	85%
Effective Working Hours	=	6
Number of shifts per day	=	3
Meterage of drilling to be effected/year	=	$300 \times 30 \times 6 \times 3 \times 85\%$ = 137700 m
No. of Drills required	=	$365860 / 137700 = 2.66$ say 3 drills

Three hydraulic drill is sufficient to take care of the drilling requirement. However as a contingency measure one Pneumatic drill (DX- 800) with the following capacity will be kept as a stand by.

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**Hydraulic Drill**

Speed of the drill (Hydraulic drill)	=	25m/hr
No. of working days in a year	=	300 days
Availability	=	85%
Effective Working Hours	=	6
Number of shifts per day	=	3
Meterage of drilling to be effected/year	=	$300 \times 25 \times 6 \times 3 \times 85\%$
	=	114750 m

**Required Drills**

Total meterage to be drilled/year	=	365860 m
Meterage drilled by One Hydraulic drill	=	137700 m
Hence three hydraulic drills is sufficient to drill the required meterage.		
Meterage drilled by One Pneumatic drill	=	114750 m (Stand By)

Hence three hydraulic drill and one pneumatic drill of 25m/hr drilling capacity should be sufficient to meet the production and development requirement of the mines

**Drill Machine Details**

Type	Make	Nos	Dia of the hole	Size/Capacity
Crawler mounted drill	Sandvik DP1100 Hydraulic drill	3	102 mm	30 m/hr
Crawler mounted	DX 800 Hydraulic drill	1	115mm	25 m/hr

**Excavation and Loading**

Hydraulic shovels of 5.7 m<sup>3</sup> & 4.6m<sup>3</sup> bucket capacity are proposed to be used for excavation and loading.

**(i) a) Excavating Parameters**

C = Nominal Bucket Capacity	=	6.70 m <sup>3</sup>
F = Bucket fill factor	=	0.85
S = Swell factor (at 25% swell)	=	0.8
i = Time cycle per pass at 90° swing	=	30 sec
e = Overall efficiency for three working shift	=	0.80
T = Seconds per hour	=	3600
n = Number of working shifts/day	=	3
h = hours per shift	=	8

For SERAJUDDIN & CO.  
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W = Working days in a year	=	300
A = Availability of machine	=	0.80
U = Utilisation Factor	=	0.80
B.D= Bulk Density	=	3.5

b) Rate of Production

$$\begin{aligned} \text{Output/shovel/hour} &= (C \times F \times S \times T)/(t) \\ &= 5.70 \times 0.85 \times 0.80 \times 3600/30 \\ &= 465.12, \text{ say } 465 \text{ m}^3 \\ \text{Output/shovel/year} &= 465 \times h \times n \times w \times e \times A \times U \times B.D \\ &= 465 \times 8 \times 3 \times 300 \times 0.80 \times 0.80 \times 0.80 \times 3.5 \\ &= 5999616 \text{ say } 5.999 \text{ Say } 6.0 \text{ Million tone} \end{aligned}$$

c) Number of Excavators

Maximum handling of material required	=	16.79 MTPA
Number of excavator (Shovels) required.	=	16.79/6.00
	=	2.798 say 3 nos

II) a) Excavating Parameters

C = Nominal Bucket Capacity	=	4.60 m <sup>3</sup>
F = Bucket fill factor	=	0.85
S = Swell factor (at 25% swell)	=	0.8
t = Time cycle per pass at 90° swing	=	30 sec
e = Overall efficiency for three working shift	=	0.80
T = Seconds per hour	=	3600
n = Number of working shifts/day	=	3
h = Hours per shift	=	8
W = Working days in a year	=	300
A = Availability of machine	=	0.80
U = Utilisation Factor	=	0.80
B.D= Bulk Density	=	3.5

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b) Rate of Production

$$\begin{aligned} \text{Output/shovel/hour} &= (C \times F \times S \times T)/(t) \\ &= 4.60 \times 0.85 \times 0.80 \times 3600/30 \\ &= 375.36 \text{ say } 375 \text{ m}^3 \\ \text{Output/shovel/year} &= 375 \times h \times n \times w \times e \times A \times U \times B.D \\ &= 375 \times 8 \times 3 \times 300 \times 0.80 \times 0.80 \times 0.80 \times 3.5 \\ &= 4838400, \text{ say } 4.84 \text{ MTPA} \end{aligned}$$

Therefore one excavator of EX - 870 make which can handle 4.84 MTPA will be kept as a standby.

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FOR SERAJUDDIN & CO

JL. Managing Partner

Excavating Machine Details

Type	Nos	Size/Capacity	Make
Hydraulic Shovel (PC 1250)	3	5.70 Cu.m bucket	Komatsu
Hydraulic Shovel (EX 870 )	1	4.60 Cu.m bucket	Hitachi

The EX -870 excavators will act as standby equipment when PC-1250 excavator is under breakdown.

Hauling

Dumping grounds are normally closely located to minimize transportation cost. The dumping area is located on the barren area/ non mineralized zone. However, for calculation of number of dumpers requirement, 2.5kms have been taken into consideration as lead on an average. The same distance is assumed for transportation of all materials including R.O.M ore, sub-grade ore etc.

Number of Passes

Number of passes required for one trip

Nominal dumper capacity

$$= \frac{\text{Bucket capacity} \times \text{Bucket fill factor} \times \text{swell factor} \times \text{material factor}}{85}$$

$$85 \text{ T Dumpers} = \frac{\text{Bucket capacity} \times \text{Bucket fill factor} \times \text{swell factor} \times \text{material factor}}{5.7 \times 0.85 \times 0.8 \times 3.5} = 6.26 \text{ say } 7 \text{ passes}$$

Dumper Cycle

Dumper cycle includes loading, hauling, unloading, returning and spotting.

- a) Loading time = Number of passes x Time cycle per pass  
= 7 x 30 = 210
- Hauling time = Lead (Km)/ Average haul speed (Kmph)  
= 2.5/15 = 10 Min or 600 sec
- Un-loading time = 30 Sec
- Returning time = Lead (Km)/average empty travel speed (KMPH)  
= 2.5/25 = 360 Sec
- Spotting time = 60 sec
- Dumper cycle time = Loading time + hauling + unloading time + empty travel time + Spotting time  
= 210 + 600 + 30 + 360 + 60 = 1260 sec
- = 3

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Efficiency	= 0.8
Availability	= 0.8
No. of Trips per day	= $3 \times 8 \times 3600 \times 0.8 \times 0.8 / 1260 = 43.88$ say 44.0 trips per day
Material handled/dumper	= $44 \times 85 = 3740$ T

**Dumper Required**

$$\begin{aligned} \text{Number of dumper} &= \frac{\text{Quantity of handling}}{\text{Tonnage handled per Dumper}} \\ &= \frac{16796210}{3740 \times 300} = 14.98 \text{ say 15 dumpers} \end{aligned}$$

**Hauling Equipment details**

Type	No.	Size/Capacity	Make
Dumpers	15	85 Tons	BEML or Komatsu

3 dumpers will be kept as standby.

**Screening**

The entire ROM will be screened. Therefore the entire production of 15.15 MTPA will be handled at the screen. The machineries required are planned below.

**Loading Equipment: (Loader WA 908):** This loader will be utilized for Stationary Screening plant is around 8.0 Million Tons

C	= Nominal Bucket Capacity	=	10.00 m <sup>3</sup>
F	= Bucket fill factor	=	0.75
S	= Swell factor (at 25% swell)	=	0.8
t	= Time cycle per pass	=	45 sec
e	= Overall efficiency for three working shift	=	0.80
T	= Seconds per hour	=	3600
n	= Number of working shifts/day	=	3
h	= Hours per shift	=	8
W	= Working days in a year	=	300
A	= Availability of machine	=	0.80
U	= Utilisation Factor	=	0.80
B.D	= Bulk Density	=	3.5

**b) Rate of Production**

$$\text{Output/Loader/hour} = (C \times F \times S \times T) / t$$

$$= 10.0 \times 0.75 \times 0.80 \times 3600 / 45$$

$$= 480 \text{ m}^3 \text{ or } 1680$$

$$\text{Output/ Loader/year} = 480 \times h \times n \times w \times e \times A \times U \times B.D$$

$$= 480 \times 8 \times 3 \times 300 \times 0.80 \times 0.80 \times 0.80 \times 3.5$$

$$= 6193152, \text{ say } 6.19 \text{ MTPA}$$

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**Number of Loaders**

Maximum handling of material required = 8.00 MTPA  
 Number of excavator (Shovels) required =  $8.00/6.19 = 1.29$  say 1 nos

**Loading Equipment: (Loader WA 600):** This crusher will be utilized for mobile and Semi Mobile Screening plant which is around 7.0 Million Tons

C = Nominal Bucket Capacity = 6.00 m<sup>3</sup>  
 F = Bucket fill factor = 0.75  
 S = Swell factor (at 25% swell) = 0.8  
 t = Time cycle per pass = 45 sec  
 e = Overall efficiency for three working shift = 0.80  
 T = Seconds per hour = 3600  
 n = Number of working shifts/day = 3  
 h = Hours per shift = 8  
 W = Working days in a year = 300  
 A = Availability of machine = 0.80  
 U = Utilisation Factor = 0.80  
 B.D = Bulk Density = 3.5

**b) Rate of Production**

Output/Loader/hour =  $(C \times F \times S \times T)/t$   
 $= 6.0 \times 0.75 \times 0.80 \times 3600 / 45 = 288 \text{ m}^3 \text{ or } 1008 \text{ T}$   
 Output/shovel/year =  $288 \times h \times n \times w \times e \times A \times U \times B.D$   
 $= 288 \times 8 \times 3 \times 300 \times 0.80 \times 0.80 \times 0.80 \times 3.5$   
 $= 3715891, \text{ say } 3.72 \text{ MTPA}$

**Number of Loader**

Maximum handling of material required = 7.00 MTPA  
 Number of Loader required =  $7.00/3.72$   
 $= 1.88$  say 2 nos

**Loading Machine Details**

Type	Nos	Size/Capacity	Make
Loader (WA - 900)	1	10.00 Cu.m bucket	Komatsu
Loader (WA - 600)	2	6.00 Cu.m bucket	Komatsu

One more WA 600 will be kept as a standby is under breakdown

**Hauling equipment:** will be a combination of 85 T and Volvo dumpers of 35 T capacity

**Number of Passes**

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$$\text{Number of passes required for one trip} = \frac{\text{Nominal dumper capacity}}{\text{Bucket capacity} \times \text{Bucket fill factor} \times \text{swell factor} \times \text{material factor}}$$

$$\begin{aligned} 85 \text{ T Dumpers} &= \frac{85}{10.0 \times 0.75 \times 0.8 \times 3.5} = 4.04 \text{ say } 4 \text{ passes} \\ 35 \text{ T Dumpers} &= \frac{35}{6.0 \times 0.75 \times 0.8 \times 3.5} = 2.77 \text{ say } 3 \text{ passes} \end{aligned}$$

**Dumper Cycle for 85 Tonners**

Dumper cycle includes loading, hauling, unloading, returning and spotting.

$$\begin{aligned} \text{b) Loading time} &= \text{Number of passes} \times \text{Time cycle per pass} \\ &= 4 \times 45 = 180 \\ \text{Hauling time} &= \frac{\text{Lead (Km)}}{\text{Average haul speed (Kmph)}} \\ &= \frac{2.5}{15} = 10 \text{ Min or } 600 \text{ sec} \\ \text{Un-loading time} &= 30 \text{ Sec} \\ \text{Returning time} &= \frac{\text{Lead (Km)}}{\text{average empty travel speed (KMPH)}} \\ &= \frac{2.5}{25} = 360 \text{ Sec} \\ \text{Spotting time} &= 60 \text{ sec} \\ \text{Dumper cycle time} &= \text{Loading time} + \text{hauling} + \text{unloading time} + \text{empty} \\ &\quad \text{travel time} + \text{Spotting time} \\ &= 180 + 600 + 30 + 360 + 60 = 1230 \text{ sec} \\ \text{No. of Shifts} &= 3 \\ \text{Efficiency} &= 0.8 \\ \text{Availability} &= 0.8 \\ \text{No. of Trips per day} &= \frac{3 \times 8 \times 3600 \times 0.8 \times 0.8}{1230} = 44.95 \text{ say } 45.0 \text{ trips per day} \\ \text{Material handled/dumper} &= 45 \times 85 = 3825 \text{ Cu.m} \end{aligned}$$

**Dumper Required**

$$\begin{aligned} \text{Number of dumper} &= \frac{\text{Quantity of handling}}{\text{Tonnage handled per Dumper}} \\ &= \frac{8000000}{3825 \times 300} = 6.97 \text{ say } 7 \text{ dumpers} \end{aligned}$$

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For SERAJUDDIN & Co  
Jt. Managing Partner

Dumper Cycle for 35 Tonners

Dumper cycle includes loading, hauling, unloading, returning and spotting.

c) Loading time	= Number of passes x Time cycle per pass = $3 \times 45 = 135$
Hauling time	= Lead (Km) / Average haul speed (Kmph) = $2.5/15 = 10$ Min or 600 sec
Un-loading time	= 30 Sec
Returning time	= Lead (Km)/average empty travel speed (KMPH) = $2.5/25 = 360$ Sec
Spotting time	= 60 sec
Dumper cycle time	= Loading time + hauling + unloading time + empty travel time + Spotting time = $135 + 600 + 30 + 360 + 60 = 1185$ sec
No. of Shifts	= 3
Efficiency	= 0.8
Availability	= 0.8
No. of Trips per day	= $3 \times 8 \times 3600 \times 0.8 \times 0.8 / 1185 = 46.86$ say 47 trips per day
Material handled/dumper	= $47 \times 35 = 1645$ Cu.m

Dumper Required

Number of dumper	=	$\frac{\text{Quantity of handling}}{\text{Tonnage handled per Dumper}}$
	=	$7000000 / 1645 \times 300 = 14.18$ say 15 Dumpers

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Hauling Equipment details

Type	No.	Size/Capacity	Make
Dumpers	7	85 Tons	HM or Komatsu
Dumpers	15	35 Tons	Volvo

One 85 T and Three 35 T dumpers will be kept as standby

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**CRUSHING**

The entire ROM will be screened. Out of the 15.15 MTPA of the screened material 50% needs crushing i.e. 7.50 MTPA

The machineries required are planned below.

**Loader for Loading :**

C	=	Nominal Bucket Capacity	=	5 T
F	=	Bucket fill factor	=	0.80
S	=	Swell factor (at 25% swell)	=	0.8
t	=	Time cycle per pass	=	30 sec
e	=	Overall efficiency for three working shift	=	0.80
T	=	Seconds per hour	=	3600
n	=	Number of working shifts/day	=	3
h	=	Hours per shift	=	8
W	=	Working days in a year	=	300
A	=	Availability of machine	=	0.80
U	=	Utilisation Factor	=	0.80

**b) Rate of Production**

$$\text{Output/Loader/hour} = (C \times F \times S \times T)/t$$

$$= 5.0 \times 0.80 \times 0.80 \times 3600/30 = 384 \text{ T}$$

$$\text{Output/Loader/year} = 384 \times h \times n \times W \times e \times A \times U$$

$$= 384 \times 8 \times 3 \times 300 \times 0.80 \times 0.80 \times 0.80$$

$$= 1415578, \text{ say } 1.42 \text{ MTPA}$$

**Number of Loaders**

$$\text{Maximum handling of material required} = 7.50 \text{ MTPA}$$

$$\text{Number of Loader required} = 7.50/1.42$$

$$= 5.28 \text{ say } 5 \text{ nos}$$

**Loading Machine Details**

Type	No.	Size/Capacity	Make
Loader	5	5 Tons	SDLG

Besides one more Wheel loader of 5 T capacity will be kept as a standby.

**Hauling equipment details****Number of Passes**

$$\text{Number of passes required for one trip} = \frac{\text{Nominal dumper capacity}}{\text{Bucket capacity} \times \text{Bucket fill factor} \times \text{swell factor} \times \text{material factor.}}$$

$$= \frac{35}{5.0 \times 0.80 \times 0.80} = 10.93 \text{ say } 11 \text{ passes}$$

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**Dumper Cycle for 35 Tonners**

Dumper cycle includes loading, hauling, unloading, returning and spotting.

d) Loading time	= Number of passes x Time cycle per pass = $11 \times 20 = 220$
Hauling time	= Lead (Km) / Average haul speed (Kmph) = $2.5/15 = 10$ Min or 600 sec
Un-loading time	= 30 Sec
Returning time	= Lead (Km)/average empty travel speed (KMPH) = $2.5/25 = 6$ min or 360 Sec
Spotting time	= 30 sec
Dumper cycle time	= Loading time + hauling + unloading time + empty travel time + Spotting time = $220 + 600 + 30 + 360 + 30 = 1240$ sec
No:of Shifts	= 3
Efficiency	= 0.8
Availability	= 0.8
No:of Trips per day	= $3 \times 8 \times 3600 \times 0.8 \times 0.8 / 1240 = 44.49$ say 45 trips per day
Material handled/dumper	= $45 \times 35 = 1575$ Cu.m

**Dumper Required**

Number of dumper	=	$\frac{\text{Quantity of handling}}{\text{Tonnage handled per Dumper}}$
	=	$750000 / 1575 \times 300 = 15.87$ say 16 dumpers

**Hauling Equipment details**

Type	No:	Size/Capacity	Make
Dumpers	16	35 Tons	Volvo

2 Dumpers will be kept as standby.

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Summary of HEMM required for the project

S.N	Type	Make	Nos	Stand by	Total	Size/Capacity
<b>EQUIPMENT FOR EXCAVATION</b>						
<b>Drill Equipment Details</b>						
1	Crawler mounted drill	Sandvik DP1100 Hydraulic drill	3	0	3	30 m/hr
2	Crawler mounted drill	DX 800 Hydraulic drill	-	1	1	25 m/hr
<b>Excavating Equipment Details</b>						
3	Hydraulic Shovel	PC -1250 - Komatsu	3	0	3	5.70 Cu.m bucket
4	Hydraulic Shovel	EX - 870 - Hitachi	-	1	1	4.60 Cu.m bucket
<b>Hauling Equipment Details</b>						
5	Dumpers	BEML/Komatsu	15	3	18	85 T
<b>EQUIPMENT FOR MOBILE SCREENING</b>						
<b>Feeding Equipment Details</b>						
6	Excavator PC 200	Komatsu / L & T	9	0	9	1.2 Cu. M Bucket
<b>Loading Equipment Details</b>						
7	Loader WA 600	Komatsu	2	1	3	6.00 cu.m. bucket
<b>Hauling Equipment Details</b>						
8	Dumpers	Volvo	15	3	18	35 T
<b>EQUIPMENT FOR NEW C &amp; S PLANT (1500 TPH)</b>						
<b>Loading Equipment Details</b>						
9	Loader WA 900	Komatsu	1	0	1	10.00 cu.m. bucket
<b>Hauling Equipment Details</b>						
10	Dumpers	HM/Komatsu	7	1	8	85 T
<b>EQUIPMENT FOR MOBILE CRUSHING PLANT</b>						
<b>Feeding Equipment Details</b>						
11	Excavator PC 300	Komatsu / L & T	1	1	2	2.1 Cu. M Bucket
12	Excavator PC 200	Komatsu / L & T	3	1	4	1.2 Cu. M Bucket
<b>Loading Equipment Details</b>						
10	Loader	SDLG	5	1	6	5 T bucket
11	Dumper	Volvo	18	2	18	35 T

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Auxillary Equipments required for the project

Table-2

S.No	Type	Make	Nos	Standby	Total	Capacity
1	Dozer	D-155	3	0	3	
2	Grader	H140/BG 605	1	0	1	
3	Rock Breaker	Komatsu / L & T	2	0	2	
4	Water Sprinkler	BEML	1	0	1	30 KL
5	Water Sprinkler	1025	1	0	1	20 KL
6	Water Sprinkler	1213	1	0	1	8 KL

Other Miscellaneous Equipment

S.N	Equipment Name	Category	Make	Capacity	Nos	Total
1	Water Tanker	TAURUS	AL	12 KL	1	11
			TATA	12 KL	2	
			TATA	8 KL	7	
2	Diesel Tanker	TAURUS	AL	20KL	3	3
3	Diesel Browser	TAURUS	AL	10 KL	1	2
			COMET	AL	8 KL	1
4	Mobile Service Van	COMET	AL		1	1
5	Welding Machine	MOBILE	ADOR	500A	1	4
			RECTIFIER	ADOR	600A	3
6	Transformer		SK LECTRICAL	150 KVA	1	1
7	Air Compressor	TS 10 120 HN	ELGL	10 HP	1	1
8	Car Washer	F 78	ATS ELGL	15 HP	1	1
9	Staff Bus	MARCOPOLO LP 709	TATA	32 SEATER	3	3
10	Light Vehicle	BOLERO	MAHINDRA	7SEATER	14	20
		CAMPER	MAHINDRA	5 SEATER	6	
11	D.G	500 KVA	CAT	500 KVA	1	8
		250 KVA	JACKSON	250 KVA	1	
		JSPF -82.5	JACKSON	82.5 KVA	3	
		82.5 KVA	KRILOSKER	82.5 KVA	2	
		JSPF -25	JACKSON	25 KVA	1	
12	Light Mast	LIGHT SOURCE	IR	6KVA	7	10
		LIGHT SOURCE	MASTRA INC		1	
		LIGHT SOURCE	IR	12.6 KW	2	
13	Ambulance	BOLERO PLUS	MAHINDRA	10 SEATER	1	1
14	Explosive Van	MAXX PICK UP	MAHINDRA		1	1

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**5.4.2 Drilling and Blasting:**

As mentioned earlier drilling will be carried out by using Hydraulic drills. The details of the drilling materage and the requirement of the drill are worked above.

Volume of excavation = 16436203 Tons

Out of the total excavation only 80 % of the material needs drilling & blasting. The rest of the Iron ore is amenable to direct excavation by excavators. Hence the material which requires blasting 13148962 Tons

**Blasting:-****Explosive Consumption:**

> Max excavation	-	16436203 Tons
> Percentage of excavation through Blasting	-	80 %
> Max excavation through Blasting	-	13148962 Tons
Daily rate of excavation (Considering 300 effective Working days in an year)	-	43830 Tons
> Power factor of the explosive	-	7.5 t/kg
> Explosive consumption	-	43830 / 7.5 = 5844 Kg

**Explosive to be used:**

Site mixed Slurry explosives/SME is being used for primary blasting. Bulk ANFO is also proposed to be used for future blasting after obtaining due permission from the statutory authorities.

No secondary blasting is carried. The oversize boulders are broken with rock breaker.

**Storage of Explosives:**

For safe and secure storage of explosives, a 5 Ton explosive Magazine is constructed at the northeastern part of the lease hold on the barren ground.

Capacity of the magazine is as follows:

Nitrate Mixture Class 2, Division I	--	5000 kgs.
Safety Fuse Class 6, Division I	--	10000 Mtrs
Detonating Fuse Class 6, Division II	--	50000 Mtrs.
Detonators Class 6, Division III	-	44000 Nos.

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**Blasting Procedure**

In the proposed mining area, 11m deep Blast holes will be drilled which consists of 10m bench height and 1m sub-grade drilling. Dia of the hole will be 102/115mm.

High explosives will be loaded by bottom charging or deck charging. The stemming length is proposed to be one third of the hole depth. The explosive column will be blasted under 'V' type blasting pattern initiated by detonator & shock tube initiation system and safety fuse.

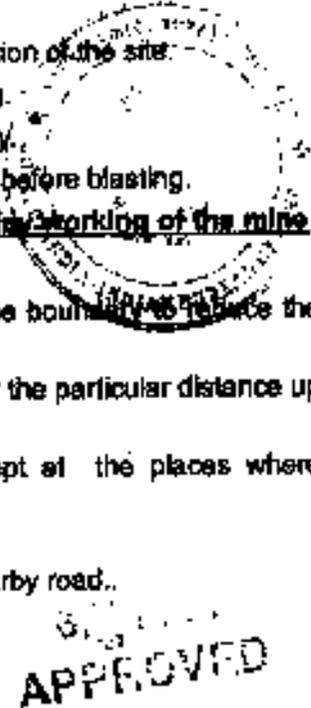
**Fly-rock Problems & Precautions**

The precautionary measures for fly rock fragments during blasting will be undertaken as follows:

- \* Controlled blasting technique will be adopted by varying burden, spacing & charge per hole depending upon the field condition.
- \* Holes will be located beyond the weak zone after proper inspection of the site.
- \* No loose pieces will be kept on the bench slopes during blasting.
- \* Stemming materials and stemming length will be chosen suitably.
- \* Proper compaction of the stemming material will be undertaken before blasting.

**Specific precautions to be taken by the Mine Manager for day to day working of the mine since the working area is near the Public road**

- Speed breakers will be made on the Public road near the lease boundary to reduce the speed of the vehicles moving on the road.
- Safety Burds will be made on either sides of the public road for the particular distance up to the extent of lease area.
- The following display boards(In Odiya & English) will be kept at the places where required
  - > Blasting Time in the mines
  - > Mine working is beyond 100 meters from the nearby road.
  - > Speed limit for particular distance
  - > Distance of the road which is in the lease area
- Blasting time will be fixed and intimated to all concerned.
- At the time of blasting, security guards will be deployed in order to block the vehicle movement on the Public road.
- In order to indicate the blasting operation, Red flags will be kept at that time where ever required.
- A Siren will be used to blow at the beginning and end of the blasting operation.



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**Manpower Requirement :**

Man power requirement for the mining project of Balda Block iron ore deposit is as below:

Description	Numbers
General Manager (1 <sup>st</sup> class manager competency)	1
Mines Manager (1 <sup>st</sup> class manager competency)	4
Asst Mines Manager / Mining Engg. (B.E.Mining)	8
Geologist (Msc. Geology)	2
Mechanical Engg. (B.E.Mechanical)	2
Environmental Scientist (Msc.Env Sc.)	2
Mining Foreman (Competency)	10
Mining Male (Competency)	10
Blaster (Competency)	12
Surveyor (Competency)	2
Clerical staff	10
Supervisors	12
Highly skilled workers	20
Skilled workers	460
Semi skilled workers	120
Unskilled workers	40
Total	715

**5.4.4 Loading and Mineral Transportation:****a) Loading :**

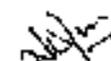
The loading of the saleable ore is done with wheel loaders. Each loader has a capacity to load about 60 truck loads in one hour. Once the loading is done, the load carrying truck comes to the weighbridge located within the mines for weighment. For accuracy of the tonnage loaded, we have installed a Quick Dispatch System by which, exact quantity permissible as per RTO depending on the truck capacity is controlled. Hence the traffic congestion is avoided because of rounding about of the trucks for fulfilling the required quantity. The Quick Dispatch System is an arrangement comprising of the over head structure to accommodate a small size excavator just above the weigh bridge. There are surge bins provided to accommodate saleable material adjacent to the weigh bridge. Any shortfall or surplus quantity in the truck at the weigh bridge point is adjusted by the excavator. The accuracy of the weighed quantity is checked by the jumbo display board which can be seen by the truck driver as well as the excavator operator. Hence the quantity dispatched from the weigh bridge will be exactly the same as permitted by the RTO and other authorities.



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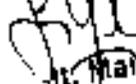


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**b) Mineral Transportation :**

Balda Block Iron Mine has few of the best dispatch logistics which includes both Road Transportation and Railway Transportation.

The mine is well connected to the Keonjhar Industrial Development Corporation (KIDCO) road which is exclusively constructed for the mineral transportation. The KIDCO is a Public Private Partnership project aimed to divert the mineral transportation through a dedicated road which connects to the NH 215. The different mine owners and industrialists of the Keonjhar District have joined with the Government and contributed for the construction of the KIDCO road. M/s Sarajuddin & Co is also one of the stake holders in the Public Private partnership and has contributed about Rs. 5 Crores to ease the traffic congestion. During the course of mining the existing road shall be used for mining. The detailed logistics of the ore to be transported is given below:

- **KIDCO Road:** Balda Block Iron Mine is approachable from Major District Road (MDR) / KIDCO road (which passes through the Balda block lease area) connecting Joda & Palasponga via Nayagarh, Malda, Parjanpur. This road is being maintained by KIDCO with lessee as one of the stake holders. Part of the ore transportation takes place through this road.
- **N H - 215:** The NH 215 is being converted in to 4 lane road and the work has already commenced, because of which the traffic congestion will be largely reduced.
- **Public Railway Siding:** The mine is located in such a way that the benefit of 4 public railway sidings can be taken, namely Banspani, Jurudi, Nayagarh and Porjanpur.
  - **Banspani:** Banspani railway siding is located at a distance of 20 km from the lease area. The capacity of the siding is about 7MTPA
  - **Jurudi:** Jurudi railway siding is located at distance of 11 km from the lease and has a capacity of about 5MTPA
  - **Nayagarh:** Nayagarh is closest to our mines and is located at a distance of just 7 km and has a present loading capacity of about 7MTPA. The Nayagarh Railway siding is in the process of enhancing the number of lanes and hence the dispatches from this sidings will further increase without any hindrance to the dispatch logistics.
  - **Porjanpur.** Out of the four, Porjanpur is less utilized by other mines because of their longer leads from their mines. Hence the sidings which are located at a distance of just 20 km is planned to be used by Balda Block Iron Mines to maximize the dispatches.

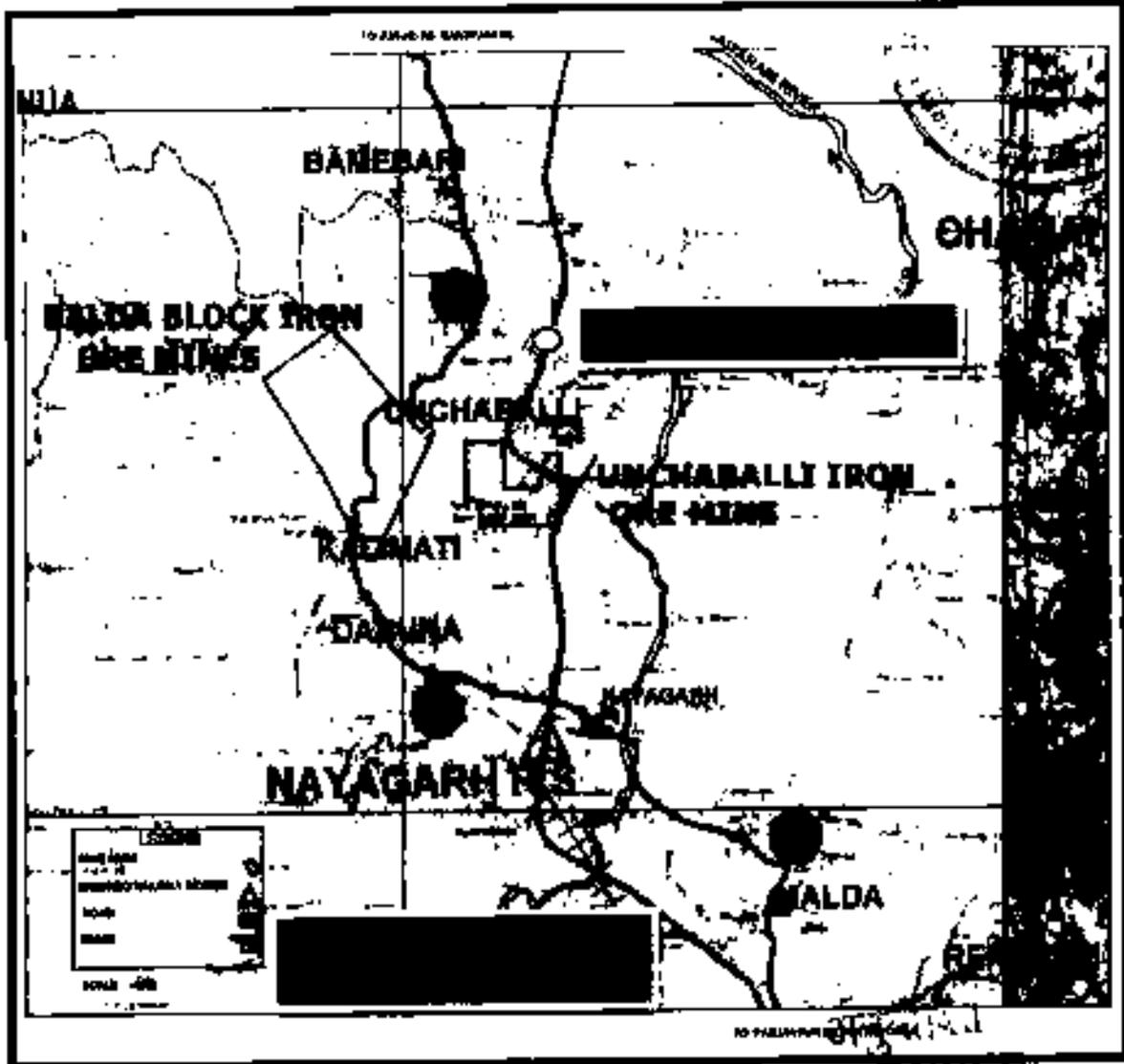
Apart from the existing capacities, the SER and the ECR of the Indian Railways is carrying out the construction of double track in order to reduce the traffic congestion fore casted. Hence the railways network and infrastructure is suitably available for enhanced dispatches.

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Logistics of Balda Block Iron Mines

A comprehensive field study including traffic survey at 3 different locations, discussions with the concerned officials, logistics / despatch department, railway officials of various sidings, etc were carried out

**Working mines in Joda – Palasponga road stretch:**

- There are 4 prominent working mines in this Joda – Palasponga road stretch namely Unchabali Iron & Manganese Mines, Patnalk Mineral Pvt.Ltd (PMPL), Jiling Mines of M/s. Essel and Jajang Iron Ore Mines of M/s Rungta apart from Balda Block Iron Mine
- Jururi, Banapani, Nayagarh and Parjanpur are the railway sidings on the Joda – Palasponga road stretch
- The Patnalk Minerals Pvt Limited, Jiling Mines of M/s Essel and Jajang Iron Ore Mines of M/s Rungta have their own private sidings and the public railway sidings are not completely utilized. Hence the Jurudi and Banapani railway siding are planned to be used by Balda Block Iron Mine.
- Truck movement from Balda Block Iron Mine and Unchabali Mines to the Jururi RS, Banapani RS on the northern side
- Truck from various mines to the Nayagarh RS on the southern side.
- Parjanpur RS on the southern side of Nayagarh RS, due to longer distance from Joda and undeveloped approach to the railway siding, this siding is almost unutilized. After Nayagarh, although the road is connected to NH- 215 near Palasponga and then to Keonjhar. There are no major truck movement in this stretch due to longer distance from other mines north west of Joda and Barbil area
- Truck movement in Bamebari traffic study location is comparatively more due to the fact that in addition to trucks plying to and fro from Nayagarh railway sidings, trucks from 2 major mines in the region namely Balda Block Iron Mine of M/s Serajuddin & Co and Unchabali mines transporting ore to Jururi, Banapani RS, ply in this stretch.
- Hence as already explained, Parjanpur RS is not utilized and Nayagarh RS is underutilized to its due to farther distance for all the mines north of Joda.

Considering the present traffic pattern, this road can be divided in three traffic zones namely:

- High traffic zone north of Jururi RS.
- Medium traffic zone between Jururi & Nayagarh RS
- Less traffic zone between Palasponga & Nayagarh RS

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**Present transportation scheme**

- The Balda Block Iron Mines of M/S Serajuddin & Co is presently working with a capacity of 4.50 MTPA of iron ore. Transportation in mines at present is for 300 days of working at 12 hrs operation per day as shown below:
- Average dispatch from mines are - 4.5 MTPA
- Material dispatch - say 13650TPD
- Through 10 T tippers (13650 /10) - 1365 Trips

**Proposed transportation scheme**

- As already mentioned, it is proposed to expand the Balda Block Iron Mine capacity to 15.15 MTPA.
- Out of the above mentioned quantity about 1/3<sup>rd</sup> is proposed to be dispatched to nearby Beneficiation Plant by belt conveyor.
- Thus the balance material for transportation is 10.0 MTPA, will be transported through rail and road out of which 80% is proposed by rail and 20% by road. To carry out the rail transportation of iron ore short trip road transportation is proposed up to railway sidings.
- The increased production and subsequent material transportation will be achieved by increasing the annual working days for dispatch to 330 days as against 300 days followed at present and the loading hour will be same as early as 12 hrs in a day. This is possible due to present improved road conditions and proposed creation of additional facilities in the loading area and by conveyor mode of transportation.
- Thus the resultant increase in the traffic due to increased production is expected to be as follows:
- Targeted production of Balda block mines – 10.0 MTPA or say 30303TPD
- By arranging 30 % of the production transport through 10 T tippers and the remaining 70% despatch through 17 T tippers. The expected truck loads per day due to increased production from Balda Block Iron mines will be:
 

Through 10 T tippers (30303* 0.3 /10)	-	910 Trips
Through 17 T dumpers (30303* 0.7/17)	-	1248Trips
Total	-	2158 Trips
- Thus the additional traffic load due to expansion will be: 2158- 1365 = 793 Trips/ day
- We also have a parking area within the mine lease exclusively for the dispatch trucks. The truck moment to the mines and from the mines shall be regulated in such a way that the density of the trucks on the road is always manageable.
- Apart from the above, the iron ore moment by railways is being encouraged by the business and also by the administration which will further reduce the road congestion.

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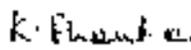
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**Transportation scheme after expansion**

- In order to avoid any major impact or strain on the existing road network after the proposed expansion, the logistic department of M/s Serajuddin & Co has developed a well laid out proposal with the following salient points in view:
- To advantageously utilize the present unutilized Parjanpur RS which, is just 20 km away from the mine and is in the less traffic zone category.
- To increase the utilization of the nearby Nayagarh RS (which is in the medium traffic zone category ) located just 3km away from the mine due to availability of surplus rake capacity, better newly laid road condition, less traffic and possibility of free flow of traffic.
- Proposal from railway for two more line under Nayagarh RS will lead to capacity increasing from 180 to 360 rakes. Construction of double line is going on.
- The traffic towards Jururi side further can be planned after the road is re-laid.
- Maximize the total by road trucks towards Palasponga side due to better newly laid road condition, less traffic and possibility of free flow of traffic and less transport distance.
- Apart from the existing railway infrastructure, we are also in the process to establish own private railway siding and a security deposit of 5 crores is already deposited to the railway authorities.

**Impact**

- No major impact on local transport infrastructure is envisaged due to the following reasons:
- The additional truck movement will be distributed and spread over evenly over a period of 12 hrs to the proposed stack yards near the siding and also on either side of the road. Hence the number of additional trucks per hour will be negligible.
- The mine is located south of Joda and Jururi RS in the medium / low traffic zone and the entire movement is planned within this zone only
- The present vastly improved and wider concrete road conditions can easily absorb this additional traffic and ensure free flow of traffic.

  
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# CHAPTER - 6



## HANDLING OF WASTE AND SUBGRADE MATERIAL

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**Chapter - VI****6.0 HANDLING OF WASTE AND SUBGRADE MATERIAL****6.1 Sub grade management:**

The material generated during mining which has Iron content of less than 58% to +45% Fe is treated as sub grade. However the Sub grade ore is mined as ROM and processed. It is envisaged to market the entire Sub grade ore.

Estimation of year wise sub-grade:

**Details of sub grade generation from the ROM produced**

S.N	Year	Block - A	Block - B	Block - VF	Block - Kaimati	Total
		(Tons)	(Tons)	(Tons)	(Tons)	
1	2012-13	1739758	307877	913487	394591	3355663
2	2013-14	1157304	371419	2500849	0	4029572
3	2014-15	1728829	0	1411080	0	3139909
4	2015-16	1098538	0	881538	0	1980074
5	2016-17	299944	0	1002307	0	1302251
		6024373	679296	6689269	394531	13787468

Out of the above mentioned quantity of 13787468 T about 75% will be blended with +58% ore and sold and only 25% of the quantity will be temporarily stacked which works out to about 3.20 MLT.

**c) Stock of Subgrade:**

Pit No - 5A, Pit 1 in Block A, Pit - 6 & Block - B will be used for temporarily stocking of the sub grade. At present looking in to the Iron Ore demand, the sub grade has potential market.

Dimension of the sub grade stacking is given below.

S.No	Location	Grid	Length (m)	Width (m)	Height (m)	Average depth of existing pit (m)	Remarks
1	Pit - 5A,  Pit - 1 in Block A	N-2421053 to N-2420790 & E-334830 to E-334780 N-2421473 to N-2421910 & E-334920 to E-335070	260	110	30	12	Already an old pit is existing, where the Sub grade will be temporarily stocked in advancing manner to gradually fill the pit and layering of sub grade is done to create sub grade stack in multiple terraces
2	Pit - 6	N-2419100 to N-2418865 & E-336720 to E-335930	260	110	30	15	Approved. Already an old pit is existing, where the Sub grade will be temporarily stocked
3	Block - B	N-2420700 to N-2419853 & E-334820 to E-335170	350	300	30	25	This block will be utilized for storing the sub grade after exhaustion of the mineral i.e., after 2 years

**6.2 Height & Spread of sub - grade Stock:**

As mentioned above only 25% of the quantity is likely to be stored temporarily and the balance quantity will be directly dispatched by blending the sub grade with +58% Fe.

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Likely generation of sub - grade iron ore	=	13.79 Million Tons
Sub grade that will be temporarily stacked	=	3.45 Million Tons or 1.23 Million M <sup>3</sup>
Swell factor	=	30%
Total volume of Sub grade to be accommodated	=	1.60 Million M <sup>3</sup>

**Pit - 1, 5, 5A of Block A**

Area of the pit	=	2.85 HA
Depth of pit where the sub grade will be stacked	=	12m (A)
Height of the stack proposed	=	30 m (B)
Holding capacity	=	60 %
Therefore total height of sub grade stacked	=	42 m (A+B)
Volume of sub grade in Pit - 5 A	=	0.718 Million M <sup>3</sup>

**Pit - 6**

Area of the pit	=	2.75 HA
Depth of pit where the sub grade will be stacked	=	15m (A)
Height of the stack proposed	=	30 m (B)
Holding capacity	=	60 %
Therefore total height of sub grade stacked	=	45 m (A+B)
Volume of sub grade in Block - B	=	0.742 Million M <sup>3</sup>

**Block - B**

Area of the pit	=	10.50 HA
Depth of pit where the sub grade will be stacked	=	25m (A)
Height of the stack proposed	=	30 m (B)
Holding capacity	=	60 %
Therefore total height of sub grade stacked	=	55 m (A+B)
Volume of sub grade in Block - B	=	3.465 Million M <sup>3</sup>

Thus the area allotted for sub grade i.e. 2.85, 2.75 & 10.50 ha in Pit - 1, 5 & 5A in block A, Pit - 6 & Block - B respectively is sufficient to store the sub grade ore in the case of contingency.

**6.3 Waste Management:****a) Nature of waste:**

The material generated during mining which has less than 45% Fe is regarded as waste. It occurs as a side burden development. The physico-chemical analysis of the waste will be carried out and the report of the same will be submitted in due course of time.

**Dumping of Waste material**

In the lease area there are 6 no of dumps spread over an area of 31.203 ha is existing. During the scheme period of the above mentioned dumps few dumps will be re-handled in the scheme period i.e. to the tune of 3.0 Million Tons for sale as marketable ore by dry screening. Further two new dumps over an extent of 7.35 ha will be added. However at the end of the scheme period about 32.253 ha will be covered by dumps

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The waste generated from mines shall be dumped in the proposed earmarked in the non mineralized area in the northeastern and eastern part of the lease area. (REF PLATE 6A to 6E) The area proposed for dumping is proved barren by drilling bore holes. The materials shall be transported to the dumping site by dumpers and tippers. The dump shall be covering a height about 40 meters in total over an area of 7.35 ha during the scheme period. The ultimate dump slope shall be maintained at 28°.

#### Dump Management:

- The area for the dumping will be demarcated on the field which will be non mineralized zone.
- Dumping will be by retreating method and will be in 3 stages each of 10m height.
- Each terrace shall have inward slope with catch drains at the inward side of terrace.
- The catch drains of the individual terrace shall be connected to the garland drain outside the periphery of the dump.
- These catch drains shall constructed followed by settling tanks to avoid wash offs.
- Dump stabilization will be carried out from the inactive side of the dump
- Each terrace have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.
- Inactive Dump slopes will be covered with coir matting and mixed grass seeds will be sprayed for additional stability of the dumps.

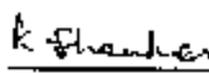
#### Details of dumps

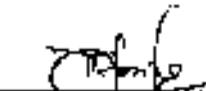
Name of the Dump	Location	Length m	Width m	Height m
Dump - A	North eastern side of the lease between N-2421530 to N-2421230 & E-335405 to E-335100	250	200	30
Dump - B	Eastern side of the lease between N-2420530 to N-2420275 & E-335780 to E-335080	250	100	30

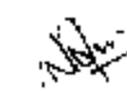
Note: The Dump A shall be started after the grant of surface rights. Until that time, the dumping shall be carried out in the Dump B.

During the scheme period about 6.30 Million Tons of waste is likely to be generated which is tabulated below. 2.03 Million Tons of waste to be generated in the fourth & fifth year of the scheme period will be temporarily stored in the Kalimati pit. The ore body is continuing from the floor of the pit which is conclusively proved from the Bore holes drilled. (Bore holes SBH 21/1, 22/2, 23/1 & 24/1). Hence future requirement of the drilling is not proposed in the above mentioned Kalimati Pit

Hence the balance waste is 4.27 Million Tons. Out of the above waste 30 % of the quantity will be utilized for bund and road making. Hence only 70% of the 2.99 Million Tons i.e. 3.97 Million Tons or 1.36 Million Cubic metres will go the above mentioned two dump yards

  
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For SERAJU PDM 6-3  
  
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**WASTE QUANTITIES FOR 5 YEAR PERIOD**

S.N.	Year	Block-A	Block-B	Block F1	Kallmati Pit	Total
1	2012-13	773152	564945	331113	324581	1933776
2	2013-14	369932	139188	566342	0	1873442
3	2014-15	771088	0	486813	0	1257901
4	2015-16	791707	0	613068	0	1404773
5	2016-17	318144	0	316705	0	634850
	Total	3024023	644113	2314030	324581	5305736

The following the year wise proposal of the protective works around the dumps

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2012-13				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Construction of parapet walls / Retaining wall at toe of dumps (mtr)	710	3.55	
	3) Construction of settling pits & Garland drain of length.	760	3.75	
	1.No. of Settling Pit	0.8		
	4) De-silting of settling pits & Channels (post monsoon)	1	1.0	
	5) Cor Geo-textile (Sqm)	7000	8.05	

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2013-14				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Construction of parapet walls / Retaining wall at toe of dumps (mtr)	900	4.6	
	3) Construction of settling pit & Garland drain etc	1000 mtr garland drain 1 no of linear de-silting pit	5.0 2.0	
	4) De-silting of settling pits & Channels	Regular @ post monsoon	1.0	
	5) Cor Geo-textile (Sqm)	10000	10.00	

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2014-15				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done		
	2) Construction of parapet walls / Retaining wall at terrace (mtr)	1700	17.00	
	3) De-silting of settling pits & Channels	Regular @ post monsoon	2.0	
	4) Cor Geo-textile (Sqm)	17000	17.00	

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Information on Targets Made of Protective Measures Undertaken for Environmental Protection In during 2015-16				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
B) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Construction of parapet walls / Retaining wall at terrace (mtr)	1700	17.00	
	3) Desilting of settling pits & Channels	Regular @ post monsoon	2.0	
	4) Coir Geo-textile (Sq.m)	17000	17.00	

Information on Targets Made of Protective Measures Undertaken for Environmental Protection In during 2016-17				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
B) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Desilting of settling pits & Channels	Regular @ post monsoon	2.00	

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## CHAPTER - 7

USE OF MINERAL

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For SERAJUDDIN & CO.

Jl. Managing Partner



Chapter - VII

**7.0 USE OF MINERAL**

**7.1 Changes proposed in the use of mineral**

Marketable ore produced from the mines are dispatched to the nearby industries. The saleable product is 5-18 mm and Fines. The saleable products are tabulated as below:

A	5 - 18 mm	62 - 64% Fe
B	0 - 5/10 mm	62 - 64% Fe

The saleable products shall be consumed by the following Sponge Iron and Steel plants buyers who consume 5 - 18 mm for steel making.

- 1 M/s Anjan Steels
- 2 M/s Bhushan Steel and Power
- 3 M/s Howrah Gases
- 4 M/s Patnaik Steels & Alloys limited
- 5 M/s Rashmi Cement Ltd
- 6 M/s Rashmi Metalliks Ltd
- 7 M/s Visa Steel Ltd
- 8 M/s Super Smelter Ltd
- 9 M/s Vision Sponge Iron Pvt Ltd
- 10 M/s Shyam Sel & Power Ltd
- 11 M/s Shanti Gopal Concast
- 12 M/s Orissa Sponge Iron & Steel Ltd, etc
- 13 M/s Deenabandhu Power & Steel
- 14 M/s Kusum Plant

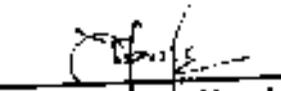
Fines are proposed to be exported. In addition about 5 million Tons of fines shall be supplied to the nearby Essar Beneficiation plant, 1 million tons shall be used by Kusum Plant of the lessee and the remaining 9 million tons shall be sold to the steel plants few of them as mentioned above.

**7.2 Changes in the specification imposed by user industries, and/ or changes in specifications required by new user industries, if any.**  
Not Applicable

**7.3 Changes proposed in the use of mineral.**

The low grade fines with Fe% >45% is proposed to be used by the nearby beneficiation plants for value addition.

  
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# CHAPTER - 8

## MINERAL BENEFICATION

For SERAJUDDIN & CO.  
Managing Partner

**Chapter - VIII****8.0 MINERAL BENEFICATION****8.1 Processing**

Presently mine is in operation with its existing crusher & Screen plant (3 x 250 TPH Mobile Screening Plant, 1 x 150 TPH Mobile crusher plant and 1 x 250 TPH Mobile Crusher plant) for production.

The details of the existing crusher and Screen Plants

S. N.	Particulars of Crusher & Screen Plants	Quantity in No's
1	150 TPH Mobile Crusher plant	1.No
2	250 TPH Mobile Crusher plant	1.No
3	250 TPH Mobile screening plant	3.Nos

Keeping in view, the enhancement of Iron Ore production to 15.15 MTPA (ROM), there will be requirement of additional crusher & screen plants. In this regard Balda block iron ore mining project has proposed the following crusher & screen plants in addition to the above.

**8.2 The details / list of additional Crusher & Screen plants proposed:**

S. N.	Particulars of Crusher & Screen Plants	Quantity in No's	Operating Hrs
1	150 TPH Mobile Crusher plant	2	The working hours of crusher & screen plants depends on the requirement towards the proposed iron ore production of 15.15 MTPA (ROM) from mines.
2	175 TPH Stationary Crusher Plant	1	
3	1500 TPH Stationary Screen & 600 TPH Crushing Plant Complex	1	
4	150 TPH Mobile Screening Plant	8	

**8.3 Detailed process scheme along with flow chart:**

Keeping in view for the production of 15.15 MTPA ROM, the above all crusher and screen plant will be established within the lease area.

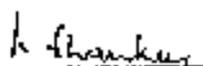
The proposed processing will be done in a dry screening & conventional crushing route.

The entire mineral processing is dry processing which only screening and size reduction by crushing which does not require any water. Apart from this no further beneficiation is proposed. Hence the water balance chart is not applicable.

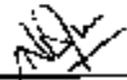
The detailed process for 15.15 MTPA ROM production, Schematic diagram of crushing & screening plant and flow charts are given below.

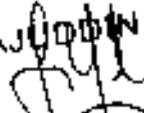
**8.4 Process Flow:**

Presently the ROM produced from the mines is processed through the screens. The screens are mobile in nature and are located near the mine face. The ROM when fed to the screen gets segregated into the following products:

  
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1. 0-10 mm
2. 10-40 mm
3. 40-80 mm
4. +80 mm

The screened 30-80 mm and +80 mm are fed to the mobile and semi mobile crushers located near the mobile screens. The +30 mm is fed to the primary jaw crusher. In the jaw crusher the primary crushing takes place. The primary crusher product is sent to the screen to segregate into 0-5 mm, 5-18 mm and +18 mm. The +18 mm (oversize) is sent to the secondary crusher. The crushed product from the secondary crusher is sent to the same screen and the circuit continues to produce the following products:

1. 0-5 mm
2. 5-18 mm

For a large scale production, it is proposed to have an integrated Stationary Screening and Crushing plant. The capacity of the stationary screening plant shall be 1500 TPH and the integrated crushing plant shall be of 600 TPH. The ROM from the mines shall be fed to the hopper fitted with a static grizzly. The grizzly will restrict the +600 mm material passing to the hopper. An arrangement of rock breaker is planned at the top of the hopper to break the +600 mm material. The -600 mm will be fed to the screen through the apron feeder. The +80 produced at the screen shall be sent to the integrated Crusher circuit, the process is explained in the next paragraph. At the screen, the material gets separated in to the following products in percentages and grade of iron ore:

The +40-80 mm shall go to the surge hopper and from there it goes to the secondary crusher of the integrated crushing system. In order to produce a better quality of 5-18 mm product, is subjected to second stage of screening. Hence the finished products are 0-5 mm, screened 5-18 mm and 10-40 mm.

Year	2012-13	2013-14	2014-15	2015-16	2016-17	Total	Grade % Fe
Production Qty in Million Tons	11.52	12.76	13.75	15.03	15.16	68.22	60 - 62
Fines	4.03	4.47	4.81	5.26	5.31	23.88	59 - 61
5-18 mm	3.11	3.45	3.71	4.08	4.09	18.42	62 - 63
High Grade Fines	2.65	2.93	3.16	3.46	3.49	15.69	62 - 63
Low grade	1.15	1.28	1.38	1.50	1.52	6.82	61 - 63

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In the integrated crusher, the +80 mm received from the screening plant shall be fed to the Jaw crusher through the Grizzly feeder and the crushed material will be sent to the surge hopper. The material from the surge hopper will be fed to the double deck screen where 0-30 mm is separated. All the +30 mm will be fed to the secondary cone crusher through the secondary crusher bin. The +40 – 80 mm from the screen plant also gets mixed in the surge hopper and will be fed to the cone crusher. All the -30 mm from the screen shall be fed to the triple deck screen to produce the following products:

1. 0-5 mm
2. 5-18 mm

The +18 mm will be sent back to the closed circuit for further crushing.

#### 8.5 Proposed Pollution Control measures:

- Dry fogging system at crusher & Screen plant towards the dust suppression
- Hooding over the conveyor belts in crusher & screen plants
- Plantation of trees in the vicinity.
- Water sprinklers in the plant area

#### 8.6 Conclusion:

The above proposed crusher & screen plants will be installed and utilized within the mine lease area as a part of Bakda Block Iron Mining Project, M/s. Serajuddin & Co towards the production of ROM of 15.15 MTPA under the administrative control of Mines itself.

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For SERAJUDDIN

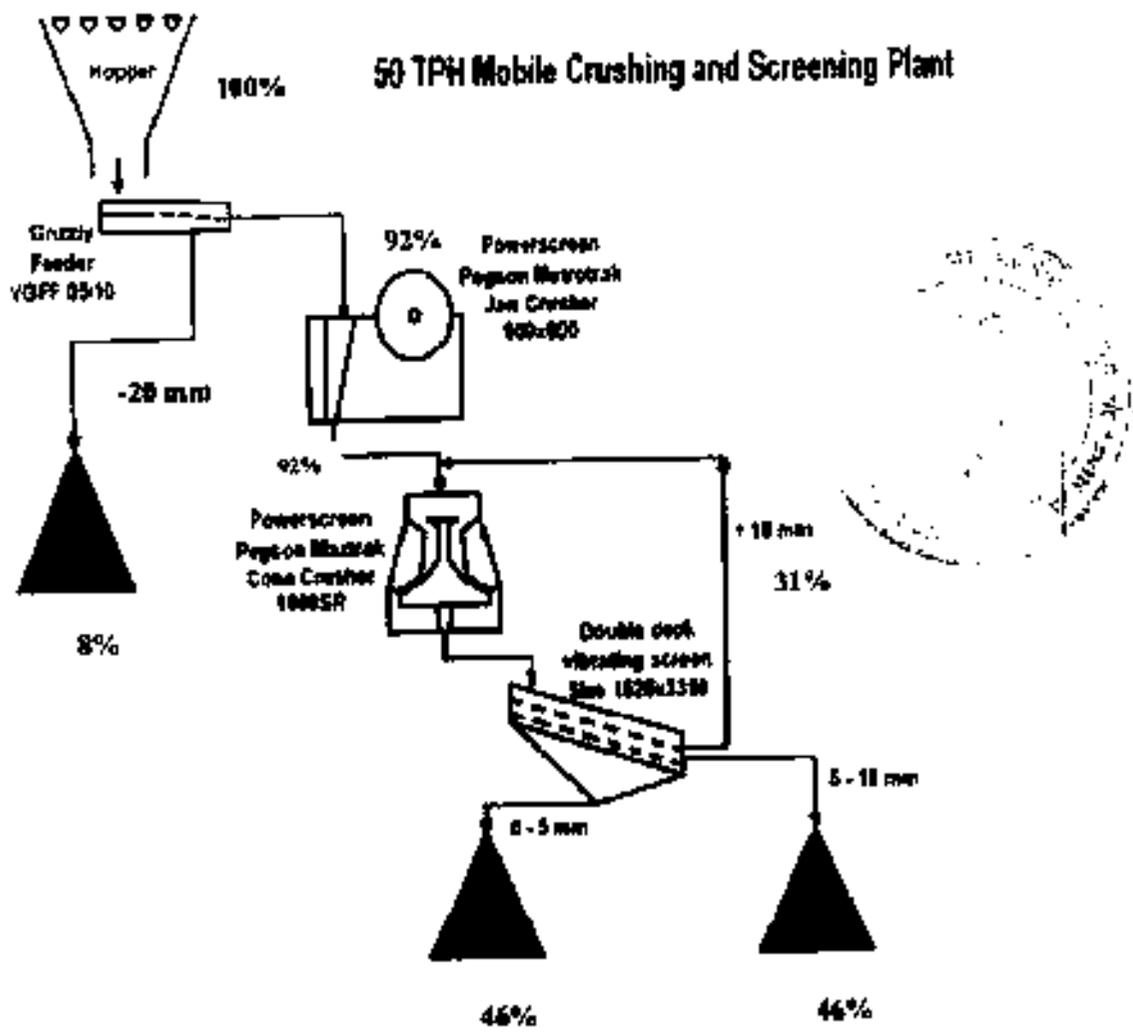
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**PROCESS FLOW CIRCUIT FOR 150 TPH MOBILE CRUSHER PLANT**



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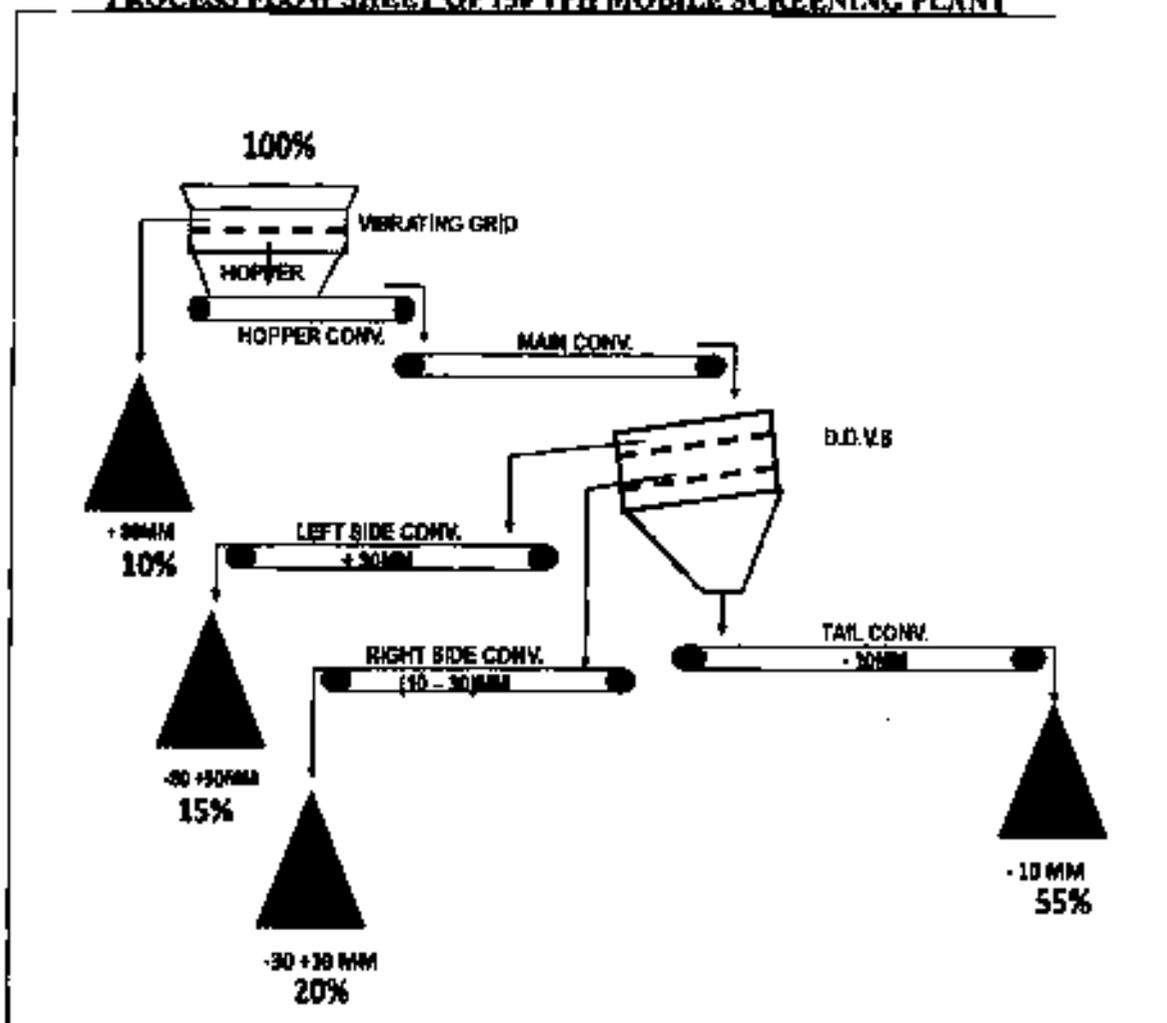
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**PROCESS FLOW SHEET OF 150 TPH MOBILE SCREENING PLANT**



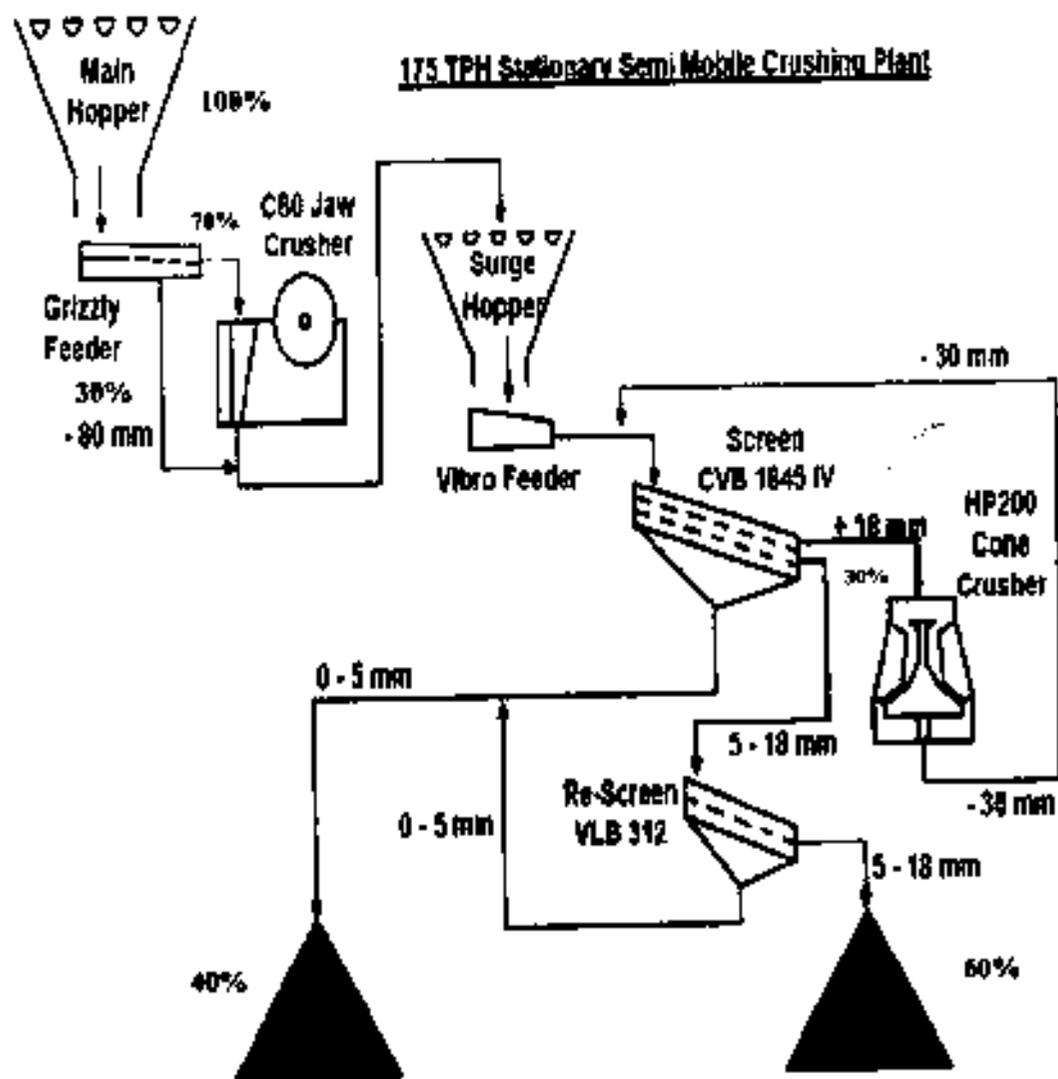
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for **SERAJUDDIN & CO.**  
*Serauddin*  
Jt. Managing Partner

**PROCESS FLOW CIRCUIT FOR 175 TPH STATIONARY CRUSHER PLANT**



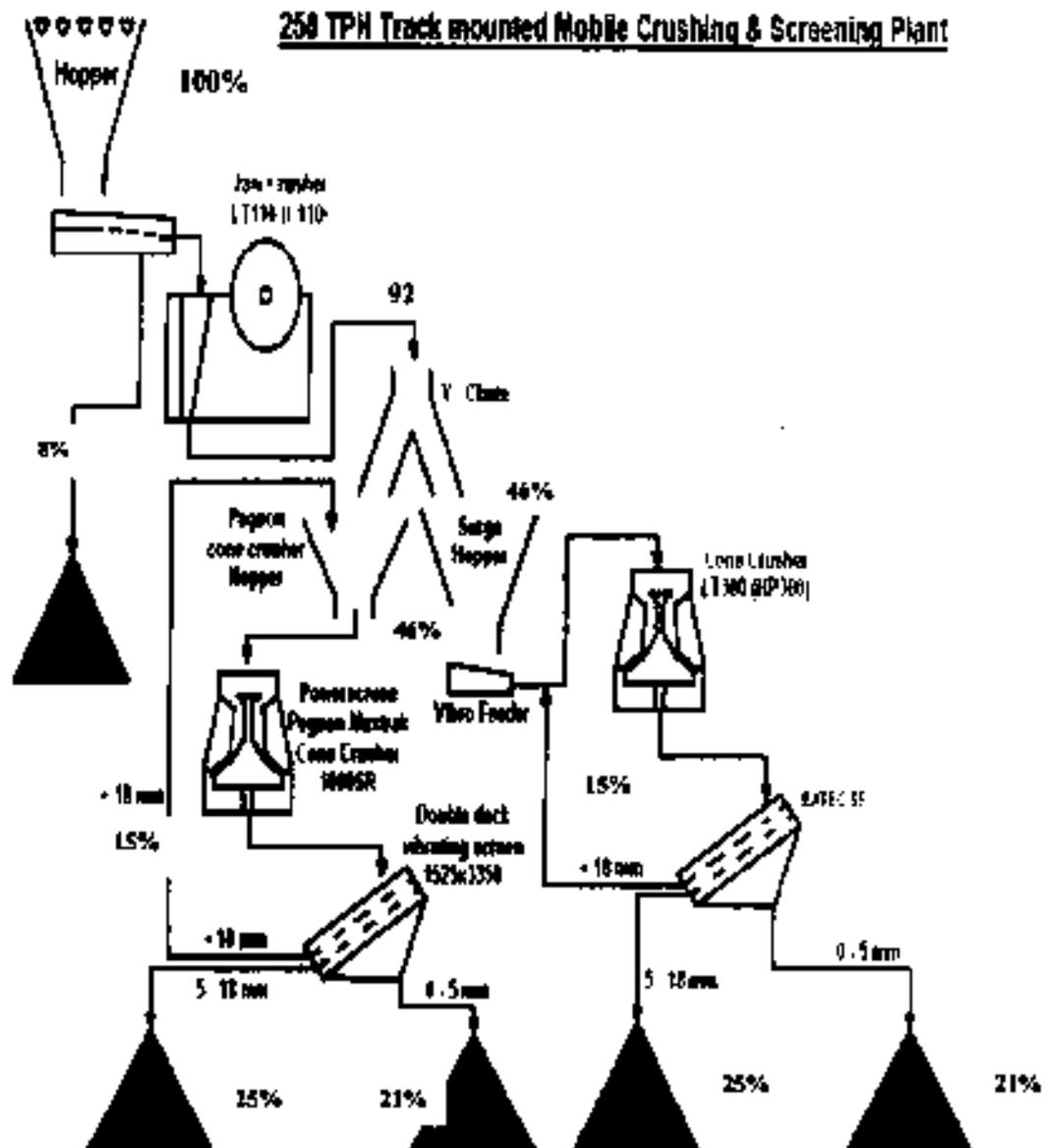
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 RQP/ICAL/31/2013/A

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 RQP/BBS/004/2010-A

**PROCESS FLOW SHEET OF 250 TPH MOBILE CRUSHER PLANT**



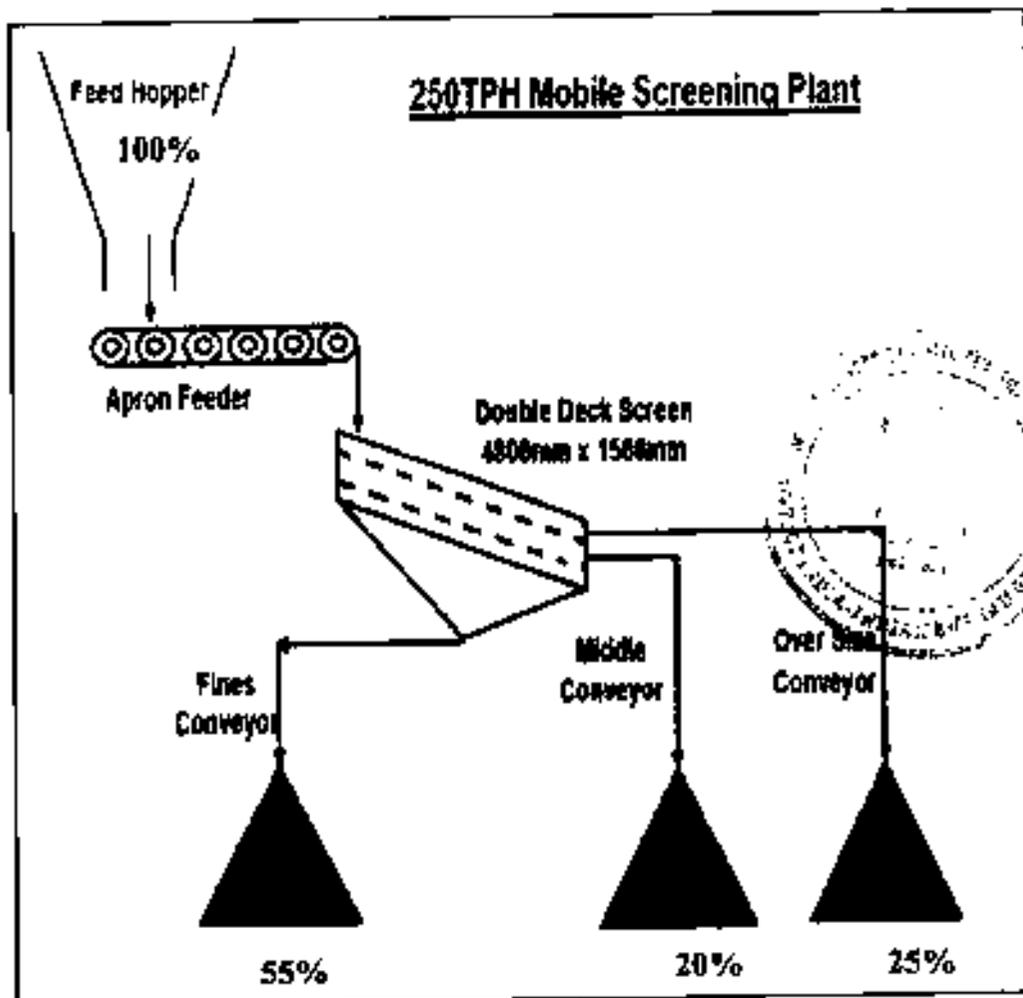
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RQP/BBB/094/2018-A

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**PROCESS FLOW SHEET OF 250 TPH MOBILE SCREENING PLANT**



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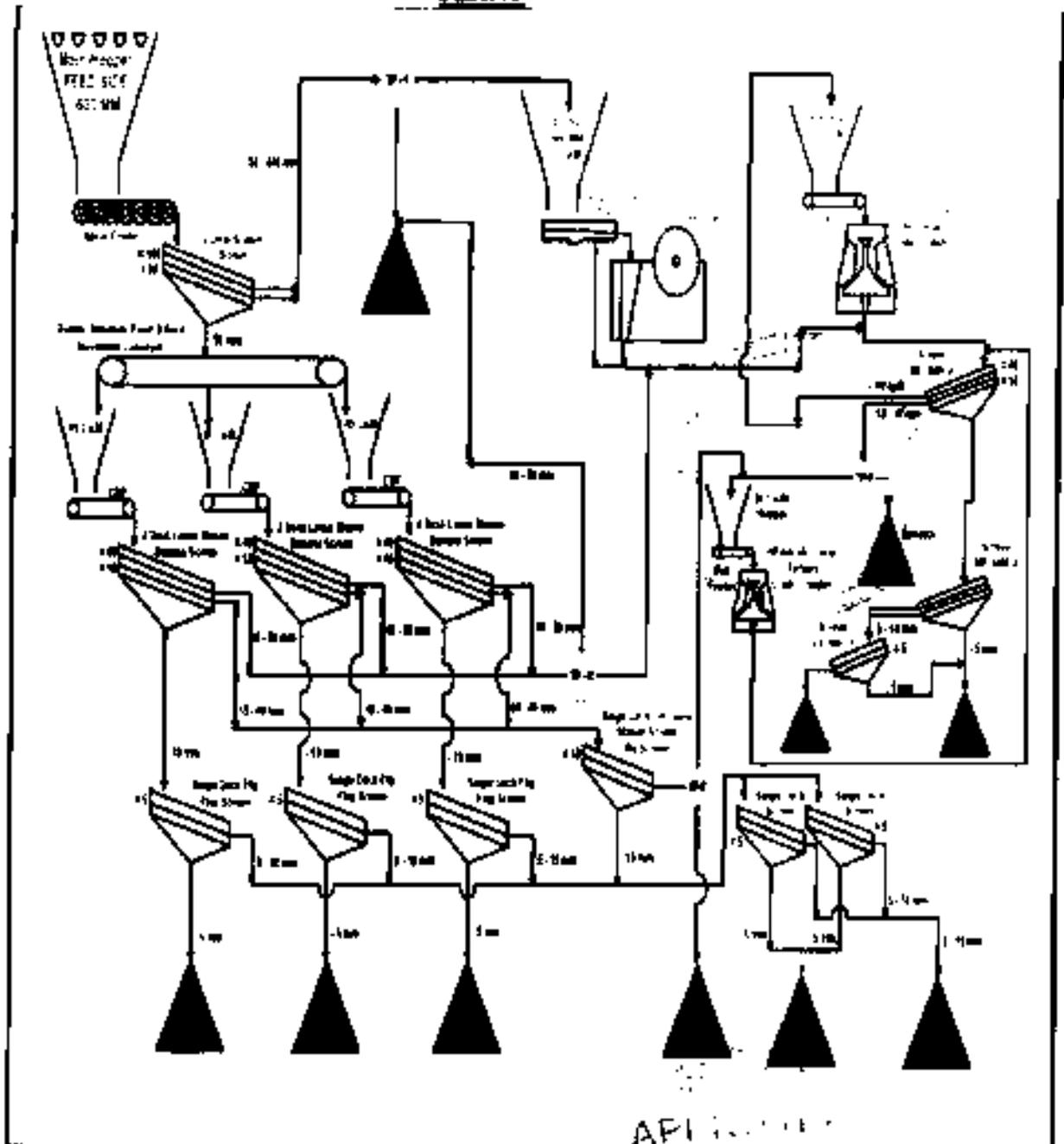
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**PROCESS FLOW CHART OF 15M TPH STATIONARY SCREENING & CRUSHING PLANT**



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for *SERAJUDDIN & CO.*  
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# CHAPTER - 9

## ENVIRONMENTAL MANAGEMENT PLAN

APR 11 2012

For SERAJUDDA & CO.  
Fr. *[Signature]*  
Jl. Managing Partner

**Chapter - IX****9.0 ENVIRONMENT MANAGEMENT PLAN**

The details about the proposals in the approved scheme of mining and the proposals for the next scheme are tabulated below:

Items	Proposals as per approved scheme of mining (for the Period of 2007-122 No 314(3)/2008 - MCM/CZ/MS-22 dated 04.02.2008)	Position at the end of 5 years of scheme of mining period 2007 to 2012	Proposals for the next 5 year scheme period 2012 to 2017
1	2	3	4
Top soil storage, preservation & utilization	No top soil found in the working area	No top soil found in the working area	There is no generation of top soil within the area proposed for mining
Land reclamation & rehabilitation	There was no planning for Land reclamation & rehabilitation	There is no planning for Land reclamation & rehabilitation	Part of Kafimati pit will be used to temporarily store sub grade during the 4 <sup>th</sup> & 5 <sup>th</sup> year of the scheme period.
Waste dump management	i) Waste dump will be stacked separately at western side of the area  ii) Retaining wall all along the slope will be provided	i) Waste dump stacked separately at South eastern and western side of the area  ii) Has been constructed.	Proposed to be dumped separately in the North Eastern and eastern side of the lease area as ear marked on the plan. Shall be constructed and maintained
Afforestation programme with precaution plantation.	Plantation has been proposed over an area of 11.68 Ha for planting 29200 saplings	Plantation has been made over an area of 26.60 ha in the safety zone, avenue plantation and dump stabilization by planting 82000 saplings.	Proposed to take up plantation over 9.20 Ha during the coming 5 years. The area covered includes plantation in the safety zone, and avenue plantation. Details of the plantation program is given below.
Quality of Air	i) Sprinkling water on the road,	Water sprinkled by installing fixed sprinklers in the processing plant area, by fixed sprinklers along the haul road and by water tanker of 35	Water sprinkling shall be continued with the existing

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dumpsite and plantation	KLD capacity.					machinery. All the new installation of screens and crusher will be equipped with dry fogging systems. All the material handling systems will be provided with covered conveyors to prevent fugitive dust. <u>Monitoring schedule:</u> Besides quality of the air will be monitored quarterly as per monitoring schedule.	
		SPM (Avg.)	PM 10 (Avg.)	PM 2.5 (Avg.)	SO <sub>2</sub> (Avg.)		NO <sub>x</sub> (Avg.)
	A1	280.3	22.68	28.82	4.51		13.09
	A2	365.03	78.88	27.47	5.16		15.9
	A3	145.43	57.78	10.57	3.82		8.03
	A4	142.0	53.51	15.88	3.35		8.04
	A5	105.6	38.31	11.82	6.0		13.24
A6	108.8	44.77	15.26	4.22	10.19		
	A1 & A2 represent the core zone and the remaining 4 stations mention the buffer zone. From the values it can be noticed that the values are well within the permissible limits.  Periodical monitoring of the air is being carried out in 6 locations, which is given in Annexure-13.						
	ii) To plant tree on either side of the traffic road.	Avenue plantation is carried out all along the express highway				Plantation on either side of express highway which will be continued.	
	iii) To adopt wet drilling on the benches, when drilling is required.	Wet drilling along with dust extractors is used to suppress the fugitive dust generation.				Wet drilling along with dust extractors is being already- practiced which will be continued	

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Quality of water including surface & ground water	To supply drinking water from dug / tube well.	<p>The water is drawn from bore well situated at the mines office. All the values monitored are well within the permissible limit of drinking water standards.</p> <p><u>Surface Water and Ground water in 6 &amp; 7 Locations respectively. Refer Annexure-14 Ground water analysis</u></p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>6.00</td> <td>8.88</td> </tr> <tr> <td>Total Suspended Solid (TSS)</td> <td>1.00</td> <td>5.3</td> </tr> <tr> <td>Total Dissolved Solid (TDS)</td> <td>38.1</td> <td>92.3</td> </tr> <tr> <td>Calcium hardness (CaCO<sub>3</sub>)</td> <td>12.0</td> <td>60.0</td> </tr> <tr> <td>Total Hardness</td> <td>22.0</td> <td>92</td> </tr> <tr> <td>Chloride</td> <td>3.98</td> <td>14.97</td> </tr> <tr> <td>Dissolved Oxygen (Do)</td> <td>BDL</td> <td>BDL</td> </tr> <tr> <td>Total Coliform at 37°C</td> <td>BDL</td> <td>BDL</td> </tr> </tbody> </table> <p><u>Surface Water</u></p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>6.13</td> <td>8.80</td> </tr> <tr> <td>Total Suspended Solid (TSB)</td> <td>2.0</td> <td>11.0</td> </tr> <tr> <td>Total Dissolved Solid (TDS)</td> <td>78.0</td> <td>99.3</td> </tr> <tr> <td>Total Hardness</td> <td>28.0</td> <td>210.0</td> </tr> <tr> <td>Chloride</td> <td>2.99</td> <td>14.97</td> </tr> <tr> <td>Total Coliform at 37°C</td> <td>7.8</td> <td>9.4</td> </tr> </tbody> </table>	Parameters	Min	Max	pH	6.00	8.88	Total Suspended Solid (TSS)	1.00	5.3	Total Dissolved Solid (TDS)	38.1	92.3	Calcium hardness (CaCO <sub>3</sub> )	12.0	60.0	Total Hardness	22.0	92	Chloride	3.98	14.97	Dissolved Oxygen (Do)	BDL	BDL	Total Coliform at 37°C	BDL	BDL	Parameters	Min	Max	pH	6.13	8.80	Total Suspended Solid (TSB)	2.0	11.0	Total Dissolved Solid (TDS)	78.0	99.3	Total Hardness	28.0	210.0	Chloride	2.99	14.97	Total Coliform at 37°C	7.8	9.4	<p><u>Monitoring schedule:</u> Surface and ground water will be periodically monitored every quarter and the analysis will be submitted regularly to Indian Bureau of Mines.</p> 
Parameters	Min	Max																																																	
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	i) If required the nala water will be used after purification	Not required.	Not required.																																																
	ii) Not to leave loose OB on pit bench.	Loose OB not allowed on pit bench.	To continue the practice.																																																
	iii) To construct sump for suspension particles to settle down	A settling tank of 108 cum capacity is constructed along the road of Kailma.	More Sumps and check dams shall be constructed.																																																
	iv) To provide guard wall along the Nala	A guard wall of 300 m is constructed along Beihajani Nala	The existing guard walls will be maintained																																																

K Shankar

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Noise level & vibration	i) Already machinery having good noise controlled system is being used	Machinery having good noise control is selected like machineries with acoustic cabins etc. The noise values monitored are well within the permissible limits. The Leq noise levels ranged from 39.53 to 53.57 dBA in the core zone and from 41.52 to 47.60 dBA in the buffer zone. Refer Annexure-15	The additional machinery will also have good noise control devices. <u>Monitoring schedule</u> The noise will be regularly monitored every quarter and the report of the same will be submitted to IBM.
Treatment of mine water.	No treatment plant was proposed. However check dam and guard wall proposed.	2 check dams and a guard wall of 300m is provided	2 settling pits will be provided.
Recirculation of treated water.	No proposal		No proposal

#### 9.1 Rainwater management plan

The water requirement is only for dust suppression and other mining activities. The entire mineral processing is dry processing which only screening and size reduction by crushing which does not require any water. Apart from this no further beneficiation is proposed.

Rain water management is an important criterion in the successful operation of the mines. Some of the salient features of the rain water management proposed are discussed below.

- Runoff water generated from adjoining high grounds on the Western side also enters the mining area and joins the main nallah.
- Runoff water is available for recharge or re-use. However, major portion of the runoff water flows through gullies and waterways and reaches the nallah.
- The contribution of precious rainwater either to the aquifer system or to the plant is very much limited.

It is appreciable that Rainwater harvesting has become the most successful scientific and cost effective technology in getting a lasting solution in order to overcome the water shortage throughout the world.

The scientific study has been entrusted to M/s. KRG Rainwater Foundation, Chennai to prepare a detailed Technical Feasibility Report on site-specific Rainwater Harvesting techniques.

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It becomes imperative for the Management to resort to various water conservation and preservation methods to get sustainable yield from the proposed rainwater harvesting ponds. It is also important to introduce de-silting structures to check the entry of silt to the main nallah.

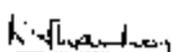
#### OBJECTIVES OF THE STUDY

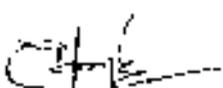
- The primary objective of the Feasibility Study is to find out suitable rainwater harvesting scheme applicable for the site and prepare a master plan for implementation of the scheme.
- To identify suitable locations for storage of runoff water in cost effective ponds for recharge purposes as well as for direct usage.
- To design effective system for utilizing roof water to recharge the bore wells.
- To identify the nature of sub surface formations occurring at the study site for designing suitable Rainwater harvesting structures.
- To stem the decline of water levels by recharging the aquifer of the premise
- To identify the drainage pattern and movement of runoff water in the mining lease area.
- To suggest suitable de-silting methods to check the entry of silt into the nallah.
- As part of Corporate Social Responsibility (CSR), M/s Serajuddin & Co. wants not only to recharge the aquifers and raise the water levels in and around the study site but also to improve the quality of ground water.

The rainfall data indicates that the monsoon period is limited to the months between June and September and the high intensity rainfall occurs for only a few days with long dry spells. Therefore, a master plan for conjunctive use of surface water during monsoon and ground water during lean period is being planned.

The Recommendations for implementing the rain water harvesting structures are based on the following parameters.

- Identification of favorable locations for the construction of cost effective Percolation Ponds and divert the runoff water.
- The stored water in the ponds can not only recharge the aquifer of the site but also can be reused for regular applications.
- Recharging the aquifer will sustain the yield from the proposed bore wells / dug wells.
- Managing the runoff water during heavy rainfall from the upper catchment area on the Western side.
- Diversion of Roof Water to the proposed bore wells located near the camp area.
- Conjunctive use of surface water sources during monsoon and ground water drawn through bore wells during summer.

  
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**SALIENT RAIN WATER MANAGEMENT STRUCTURES PROPOSED ARE AS FOLLOWS**

- 1) **Construction of storage cum percolation pond**  
Location: Open area near the Nallah on the North Eastern side between the Express Highway and Leased Area (West of Pillar 27)
- 2) **Construction of desilting pond**  
Location: North Eastern side (Downside of Quarry 1)
- 3) **Construction of percolation pond**  
Location: South Eastern Side (near Pillar no. 65 on the Eastern side of Express Highway)
- 4) **Construction of Linear Pond on the South Eastern Side**  
Location: North of the Dump near Quarry No. 6
- 5) **Arrangement to Check the Entry of Silt from the Mine Dumps**
  - Provide retaining wall to a height of 1.2 m above ground level at the base all along the boundary of the mine dumps. Provide weep holes in the retaining wall for drainage of water.
  - Construct Garland drain outside the retaining wall to channelize the runoff water towards the nearby gullies.
  - Construct barriers at suitable intervals along the path of the drain.
- 6) **Arrangement to Remove Silt and Suspended Particles in Gullies**
  - Provide gully plugs with locally available boulders in the gullies at suitable intervals on the upstream side.
  - The gully plugs will check the velocity of the flowing water and deposit the Silt at the base gully which can be removed periodically. Remove the silt from the upstream side of the gully plug.
- 7) **General Recommendations**
  - Provide bunds on the edge of all the approach roads to avoid flow of water along the sides of side walls of mine cut areas.
  - Construct small drains on the Western side of the roads and provide slope of the road towards Western side so that the runoff water from the roads and side wall will be channelized into the drains.
  - Construct barriers at suitable intervals along the path of the drains.
  - Construct gully plugs across the path of the nallahs with locally available boulders to check silt deposition

**9.2 Afforestation programme:**

As per approved scheme of mining, for arresting dust and creation of green belts around the safety zone and along the road has already been carried out. Gap filling plantation along the safety zone and the remaining portion of the road will be carried out during the present scheme period. In addition it is also proposed to carry out the plantation on the inactive waste dumps, avenue plantation etc. Mainly native species are selected.

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Year wise plantation programme detailing the nos of saplings, location, area and type of species are tabulated below:

Year	Safety belt Plantation (in ha)	Average Plantation (in ha)	Dump Plantation (in ha)	Total area (in ha)	No of saplings	Name of the species
1 <sup>st</sup> Year (2012-13)	1.20	0.60	-	1.80	5800	Satanus, Chakunda,
2 <sup>nd</sup> Year (2013-14)	1.20	0.60	-	1.80	9000	Karap, Ajun
3 <sup>rd</sup> Year (2014-15)	1.20	0.60	-	1.80	5000	Sheha, Radhachuda
4 <sup>th</sup> Year (2015-16)	1.20	0.70	-	1.80	5250	Krishnachuda
5 <sup>th</sup> Year (2016-17)	1.20	0.70	-	1.80	5250	
<b>Total</b>	<b>6.00</b>	<b>3.20</b>	<b>-</b>	<b>9.20</b>	<b>29500</b>	

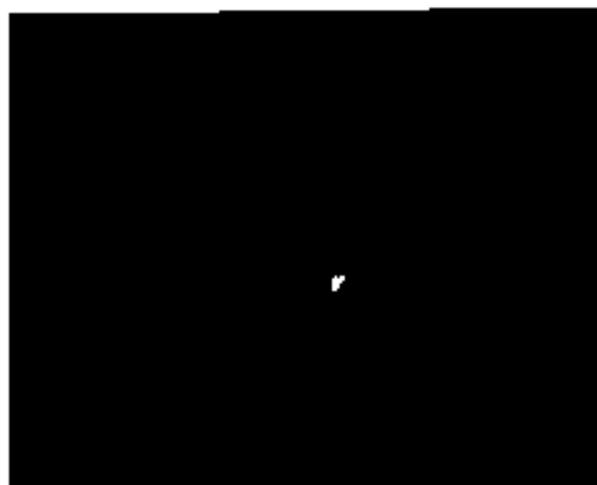
K. Shankar  
RQP/MAS/117/88/A

Nihar Ranjan Nayak  
ROP/CA/2012/008/A & CO.  
For SERAJUDIN & CO. 9-7

Y Nagendra  
RQP/BS/054/2012-A

Jt. Managing Partner

ENVIRONMENTAL CONTROL MEASURES



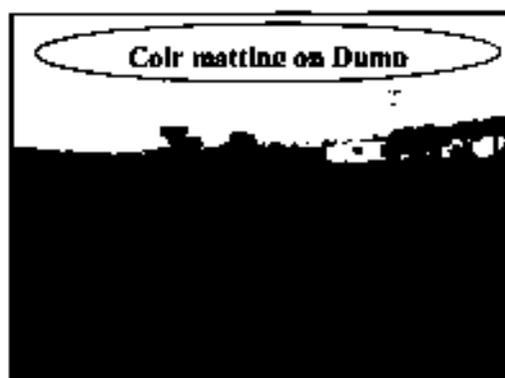
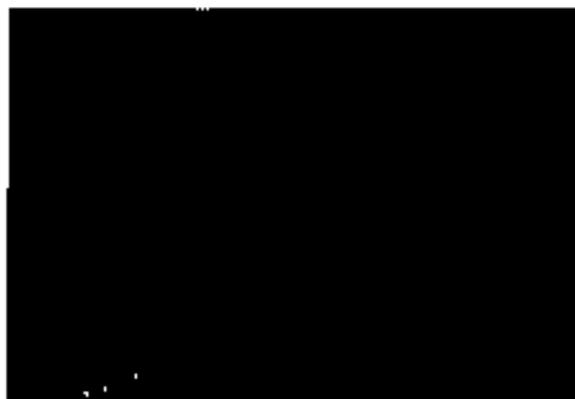
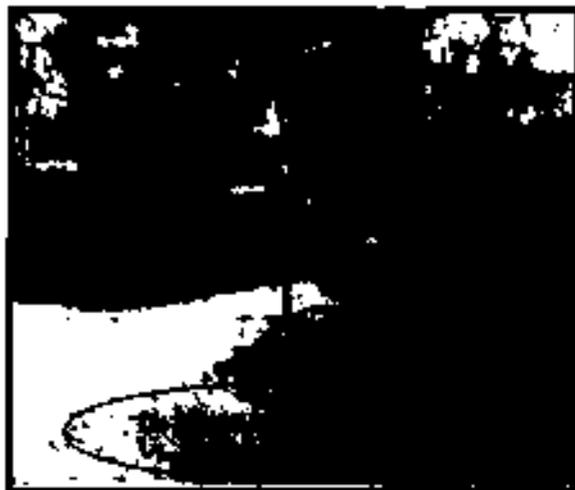
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FOR SERAJUDDIN & CO.  
Jt. Managing Partner  
K. Shankar

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ENVIRONMENTAL CONTROL MEASURES



APPROVED

*K Shankar*  
**K Shankar**  
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**Nihar Ranjan Nayak**  
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*Y Nagendra*  
**Y Nagendra**  
RQP/BS/054/2019-A

CHAPTER - 10

ANY OTHER INFORMATION

For SERAJUDDIN & CO.

Jl. Managing Partner

**Chapter - X**

**10 ANY OTHER INFORMATION**

**10.1 Conservation of minerals**

From the point of view of Conservation of minerals ore analyzing between +45 to -55% Fa is treated as sub grade and is stacked separately which can be beneficiated and utilized. In fact the lessee has a proposal of setting up of a beneficiation plant in future.

**10.2 Protection of environment**

The Lessee obtained Environmental clearance for a production capacity of 1.482 MTPA vide letter number letter no.J-11015/319/2006-IA. II (M) on dtd.21.08.2007 from MoEF, Govt of India (A copy is attached as Annexure - 3).

Further the lessee has applied for expansion of iron ore production from 1.482 MTPA to 4.50 MTPA of iron ore. The 4.50 MTPA Environmental clearance from MOEF is approved in principle vide its minutes which are uploaded in the website.

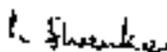
Regular monitoring of the vital Environmental parameters is being carried out regularly by a in house Environmental monitoring cell headed by the General Manager (Mines).

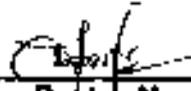
In recognition of the protection measure the mines has recently won 3<sup>rd</sup> prize in the waste dump management in the Mines Environment & Mineral Conservation week 2010.

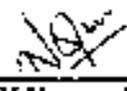
Similarly the lessee has earmarked a budget for Environmental control measures which is spent for protection of Environment.

Some of the salient measures which were carried out are listed below:

- Colr matting over an area of 7000 sq.m on the dump yard
- Retaining wall over a length of 1600 m
- Number of Check dams with in the mining lease
- Guard wall across Nala
- Plantation of a number of saplings along safety zone, avenue plantation and dump stabilization plantation.

  
K Shanker  
RQP/MAS/17/00A

  
Nihar Rajan Nayak  
RQP/CAL/281/2013/A  
For SERAJUDDIN & CO.  
  
Jt. Managing Partner

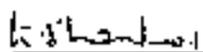
  
Y Nagendra  
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CSR ACTIVITIES



ROJ SERAJUDDIN & CO.

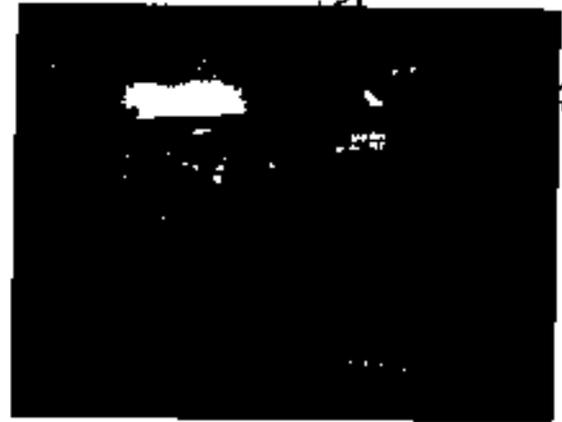
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RQP/MASH/17/88/A

  
Nihar Ranjan Nayak  
RQP/ICAL/29/2003/A

  
Y Nagendra  
RQP/BB5/094/2810-A

CSR ACTIVITIES



APPROVED

K Shankar

K Shankar  
RQP/MS/117/08/A

Nihar Ranjan Nayak  
RQPICAL/291/2008/A

For SEFAJUDDIN & CO.

Jt. Managing Partner

Y Nagendra  
RQP/BBS/094/2010-A



**Progressive Mine Closure Plan**

**APPROVED**

For SERAJUDIN & CO.  
*[Signature]*  
J. Managing Partner

**PROGRESSIVE MINE CLOSURE PLAN**  
**SUBMITTED UNDER RULE 23(b) OF AMENDED MCDR, 2003**

**1.0 Introduction:**

The mining lease area over 335.594 hectares of Balda Iron Mines of M/s.Serajuddin & Co. is being operated by fully mechanized means for extraction of Iron ore.

**Name of the Lessee:**

M/s.Serajuddin & Co

At / Po-Joda

Dist-Keonjhar, State Odisha

Pin-758034

Phone-(06767) 273452

(06767) 236720.E Mail: seraj@serajuddnmines.com

**Location and Extent of Lease Area:**

Balda Block Iron Mine,

Champua Sub- Division, Dist. Keonjhar.

ML area – 335.594 hectares

Topo sheet no.73G/5

Latitude: 21°51'42" to 21°53'33" North

Longitude: 85°23'47" to 85°25'18" East

**Type of the Lease Area:**

Name of the Village	Village Forest in Acres	DLC Forest in Acres.	Total Forest in Acres.	Non Forest in Acres	Total Area in Acres
Balda	78.75	463.33	543.08	188.38	709.46
Nayagarh	---	80.18	80.18	---	80.18
Kallmet	14.60	---	14.60	25.03	39.63
	<b>98.35 Acres/ 38.182 ha</b>	<b>543.51 Acres/ 218.881 ha</b>	<b>637.86 Acres/ 258.133 ha</b>	<b>181.41 Acres/ 71.461 ha</b>	<b>828.27 Acres/ 335.594 ha.</b>

**The method of mining & mineral processing operations:**

Fully Mechanized Open cast Method.

*K Bhankar*

**K Bhankar**  
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*Nihar Ranjan Nayak*

**Nihar Ranjan Nayak**  
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*Y Nagendra*

**Y Nagendra**  
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For SERAJUDDIN & CO.

*[Signature]*

Jt. Managing Partner

**The Present Land - Use Pattern**

Sl No	Head	Area put on use at start of scheme (Ha)
1	Area of excavation	68.617
2	Storage of top soil	Nil
3	Overburden/dump	31.203
4	Mineral Storage	1.196
5	Infrastructure (Workshop/Building)	0.2
6	Roads	7.210
7	Railways	Nil
8	Safety Zone	25.80
9	Effluent treatment plant	Nil
10	Mineral Separation plant	Nil
11	Magazine	0.169
12	Temporary Colony	0.834
13	Others (Retaining wall, check dams)	0.562
14	Area utilized	133.611
15	Area for plantation in Safety Zone	22.608
16	Area which will remain for future exploration	179.977
<b>TOTAL</b>		<b>335.584</b>

**1.1 Reasons for Closure:**

Presently not applicable. However after complete excavation of mineral the closure planning shall be done.

**1.2 Statutory obligations:**

The applicant will carry out mining operations as per provisions of the Mines Act - 1952, MMR - 1961, MCR- 1960 and MCDR - 1968 and other rules framed by Central and State Government as applicable from time to time for 'A' category mines.

The forest clearance under F.C. Act 1980 has been accorded by MOEF, GOI, New Delhi vide letter no B - 119/96 - FC dated 11<sup>th</sup> December, 1998. A copy is enclosed as Annexure - 2. Environmental clearance has been obtained for 1.482 MTPA from MOEF, GOI vide letter no J-11015/319/2006 - IA.II (M), dated 21<sup>st</sup> August, 2007.

Further the lessee has applied for expansion of iron ore production from 1.482 MTPA to 4.50 MTPA of iron ore. The 4.5 MTPA Environmental clearance from MOEF is approved in principle vide the minutes which is uploaded in the website.

For SERAJUDDIN & CO.

*[Signature]*  
Jt. Managing Partner

**K Shankar**  
RQP/MA9/117/96/A

*[Signature]*  
**Nihar Rajan Nayak**  
RQP/CA/291/2003/A

*[Signature]*  
**Y Nagendra**  
RQP/BS/294/2013-A

**1.3 Closure Plan Preparation:**

Name of the RQP preparing the Mine Closure Plan:

<b>Shri K.Shankar</b> Regd. No RQP / MAS/117/88/A Valid till 18.04.2020 New No – 49, Old No – 23, Umapathy Street West Mambalam Chennai – 600 033 – 044- 24722195, 9444119196 E-mail: empres05@rediffmail.com	<b>Shri Y.Nagendra</b> Regd. No RQP /BBSR/094/2010-A Valid till 05.05.2020 Thrivent Consultancy Services Bonallala Joda-768034 Dist Keonjhar, Orissa Phone: 09437072848 nagendra.y._bbsr@rediffmail.com	<b>Shri Nihar Ranjan Nayak</b> Regd No RQP/CAL/291/2003/A Valid till 09-11-2013 Balda Block Iron Mine M/s Serajuddin & Co At / Po Joda Dist. Keonjhar, Orissa Phone: 273452 nihar.nayak@serajuddin.com
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**2.0 Mine Description:****2.1 Geology:**

The Balda Block Iron Mine located in village (s) - Balda, Bada Kalimati & Nayagarh under Bamebari P.S. of Keonjhar District, Odisha forms a part of pre-Cambrian Iron Ore series, under Iron Ore Group of Upper Dharwar age, in Singhbhum – Keonjhar - Bonal area. The general strike of deposit is E-W, which gradually swings to NW-SE towards further east near Mayurbhanj. The iron ore series consists mainly of banded hematite quartzites or jasper and shale with intercalations of phyllites and tuffs. The iron-ore series are overlain by rocks of Kolhan series consisting of sandstone, Iron Ores and shale, considered to be of Cuddapah age.

**Geology of the Area**

Geologically the area is represented by a variety of rocks belonging to Iron Ore Super Group of Archean age which include older metamorphics, meta-sedimentaries and intrusives. Ferruginous and manganeseiferous laterites occur as capping and discontinuous patches over these formations. Recent alluvium occurs in very narrow patches along nala etc. The general strike of the area is NS and the dip ranges from 20 to 45°, generally dipping easterly.

**Geology of the Leasehold:**

The occurrence of iron forms a part of pre- Cambrian sedimentary formation known as the iron ore series developed in Singhbhum – Keonjhar – Bonal area. The lithology succession is as follows:

The lease hold area exposes different litho units comprising of banded iron formations with iron ores, ferruginous shale which are commonly found to have been intensely lateritized. The disposition of these litho units with the associated structural features, as Soil & Alluvium, Ferruginous Laterite, Float iron ore, Hard & Soft Laminated Iron ore of Precambrian age, In-situ massive iron ore, Friable ore, banded iron formations and Shale.



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RQP/MAS/117/88/A

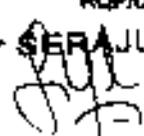


**Nihar Ranjan Nayak**  
RQP/CAL/291/2003/A



**Y Nagendra**  
RQP/BBS/094/2010-A

For **SERAJUDDIN & CO.**

  
Jt. Managing Partner

## 2.2 Reserves:

The total geological reserve of the lease is 321.355 million MT. As can be seen from Geological sections certain quantity of iron ore will be blocked due to overall pit slope of 37.5°, 50 m safety zone on either side along H.T. electric line passing through the area, 7.5m zone along the M.L. boundary, 50m along express highway on either side and 50m along perennial nala. Hence the mineable reserves remain only 278.561 and out of the total mineable reserves, 233.193 Million Tons is with +68% Fe and is considered as marketable and the balance 45.368 Million Tons of +45 to -58% Fe is considered as sub grade ore.

Geological Reserves (proved)	-	256.085 million tons
Geological Reserves (probable)	-	65.270 million tons
Total Geological Reserves (proved + probable)	-	321.355 million tons
Mineable Reserves (Proved)	-	233.193 million tons
Mineable Reserves (Probable)	-	45.368 million tons
Total Mineable Reserves (proved + probable)	-	278.561 million tons

The reserve has been discussed in Chapter - 3.4 of the Scheme of Mining

## 2.3 Mining Method:

The method of working is opencast mechanized mining considering various technical parameters like surface topography, continuation of iron ore deposit, quality variations, geo-technical aspects, required rate of production etc., it is proposed to work this deposit by adopting 10.0 m bench height and a width more than the height of benches (not less than 15m) with an ultimate pit slope of 37.5°. The ramp gradient shall be maintained at 1 in 16.

### Pre production development work:

The main work comprises of waste removal, blast hole drilling and blasting.

The following are the steps involved for winning iron ore.

**Drilling:** Hydraulic / Pneumatic Drills shall be used to drill holes of 102/115 mm diameter to a depth of 11 meters including sub-grade drilling in a single or multi rows.

**Blasting:** Slurry/Emulsion explosives, Bulk ANFO (BMD) are proposed to be used for primary blast. High explosives will be loaded by bottom charging or deck charging. The stemming length is proposed to be one third of the hole depth. The proposed rows of blast holes will be blasted as "V" pattern initiated by non electric shock tubes, detonators and safety fuse.

**Loading and Hauling:** Excavator/backhoe with the combination of 85 Tons dumper will be used for transportation of mineral from the mines to Screens/ crusher and for handling the waste.

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#### 2.4 Mineral Beneficiation:

The ROM produced from the mines is processed through the screens and segregated into the following products:

1. 0-10 mm
2. 10-30 mm
3. 30-80 mm
4. +80 mm

The screened 30-80 mm and +80 mm are fed to the mobile and semi mobile crusher located near the mobile screens. The +30 mm is fed to the primary jaw crusher. In the jaw crusher the primary crushing takes place. The primary crusher product is sent to the screen to segregate into 0-5 mm, 5-18 mm and +18 mm. The +18 mm (oversize) is sent to the secondary crusher. The crushed product from the secondary crusher is sent to the same screen and the circuit continues to produce the following products:

1. 0-5 mm
2. 5-18 mm

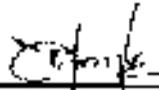
It is now proposed to have an integrated Stationary Screening and Crushing plant. The capacity of the stationary screening plant shall be 1500 TPH and the integrated crushing plant shall be of capacity 400 TPH. The ROM from the mines shall be fed to the hopper fitted with a static grizzly through Apron Feeder. The grizzly will restrict the +600 mm material passing to the hopper. An arrangement of rock breaker is planned at the top of the hopper to break the +600 mm material. The -600 mm will be fed to the screen through the apron feeder. The +80 produced at the screen shall be sent to the integrated Crusher circuit, the process is explained in the next paragraph. At the screen, the material gets separated in to the following products:

1. 0-5 mm
2. 5-18 mm
3. 18-40 mm
4. +40-80 mm

The +40-80 mm shall go to the surge hopper and from there is goes to the secondary crusher of the integrated crushing system. In order to produce a better quality of 5-18 mm, it is subjected to second stage of screening. Hence the finished products are 0-5 mm, screened 5-18 mm and 10-40 mm.

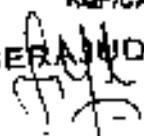
In the integrated crusher, the +80 mm received from the screening plant shall be fed to the Jaw crusher through the Grizzly feeder and the crushed material will be sent to the surge hopper. The material from the surge hopper will be fed to the double deck screen where 0-30 mm is separated. All the +30 mm will be fed to the secondary cone crusher through the secondary crusher bin. The +40 - 80 mm from the screen plant also gets mixed in the surge hopper and will be fed to the cone crusher. All the -30 mm from the screen shall be fed to the triple deck screen to produce the following products:

  
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1. 0-5 mm
2. 5-18 mm

The +18 mm will be sent back to the closed circuit for further crushing.

The entire mineral processing is dry processing in which only screening and size reduction by crushing takes place and does not require any water. Since it is a dry processing plant, the water balance chart is not prepared.

### 3.0 Review of implementation of mining plan/scheme of mining including five years progressive closure plan upto final closure of mine closure plan:

Details of the proposal for protection of environment in the approved scheme of mining with status are already mentioned in chapter No. 06 of mining scheme. There is no deviation by mining activities for the protection of environment.

### 3.1 Review of compliance position of salient features of mining scheme & justifications, if any.

**Exploration:**

**Commitment:**

It was proposed to drill 75 nos of core drilling during the scheme period of 2007-2012.

**Compliance:-**

As mentioned within modification of scheme of mining, 122 no of bore holes had been drilled within the area. The exploration has been carried out in a grid of 100 \* 100m except in the DLC forest area which is applied for diversion under FC Act - 1980.

Year	No of Bore hole proposed	No of Bore hole completed
2007 - 08	Nil	Nil
2008 - 09	15	Nil
2009 - 10	20	Nil
2010 - 11	20	56
2011 - 12	20	86
<b>Total</b>	<b>75</b>	<b>122</b>

**Note :** The lessee has drilled 25 DTH holes in the year 2007-08 and the date of which is not available.

#### a) Mine development:

**Commitment:**

Mining operation was proposed in the Block A, B, C, D, E & F besides small quantity is produced from the dumps with a proposed maximum development of 1028112 m<sup>3</sup> within the financial year of 2011-12. Development of pits were proposed laterally and as well as depth wise.

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**Compliance:**

Though it has been proposed for six blocks, the actual mining during the mining scheme period is pre-dominantly carried out in pit No - 1, 2, 5 & 4 which fall in Block A & Block - B. The development achieved to meet the targeted production is mentioned below. Pits have been developed laterally as well as depth wise and over all pit slope angle has been kept at about 45°.

Year	Proposed (In Cu.m)	Actual (In Tons)	Actual (In Cu.m)
2007 - 08	886758	120000	54545
2008 - 09	840454	234000	106364
2009 - 10	1009654	217000	98836
2010 - 11	921400	626810	284914
2011 - 12 (Sep- 2011)	1028112	1049376	476989
<b>Total</b>	<b>4686378</b>	<b>2247188</b>	<b>1021448</b>

**Reason for deviation:**

Since the entire target production was not achieved the quantity of overburden generated was less.

However it is pertinent to mention that part of the quantity of overburden generated is accounted as sub grade as the threshold of sub grade is now +45% Fe instead of earlier value of +55% Fe. vide circular of Indian Bureau of Mines No. K/11013/1/2008-CMG dated 27.02.2009. Hence the overburden quantity is less.

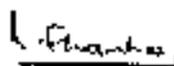
**c) Exploitation:****Commitment:**

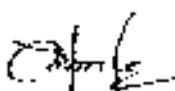
Mining operation was proposed in the Block A, B, C, D, E & F besides Iron. Quantity is produced from the dumps with a maximum production of 4051431 MT in the year 2011-12.

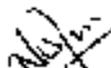
**Compliance:-**

During the mining scheme period, production has been carried out in pit No - 1, 2, 5 & 4 which fall in Block - A & Block - B. The production target and actual production during the mining scheme period are as tabulated below:-

Year	Proposed production in Tons	Actual Production in Tons
2007 - 08	1668158	1407601
2008 - 09	2475195	2324000
2009 - 10	2648110	1140792
2010 - 11	3371501	1478930
2011 - 12 (Till Sep -11)	4051431	1456477
<b>Total</b>	<b>14214395</b>	<b>7807700</b>

  
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**Reason for deviation:**

The targeted production was not achieved as there was process delay of the Environmental clearance.

**d) Waste management:****Commitment:**

2 numbers of dumps were proposed for dumping within scheme period i.e. southeastern and western part of the lease area. Provision has been made to dump total quantity of laterite, morum & shale as waste to be generated within scheme period in separate dumps.

**Compliance:-**

The total waste generated during the period of Scheme of Mining had been dumped in old dumps situated near Block A (Pit 1, 2 & 5) & Block B (Pit 4). These dumps proposed in the scheme of mining were not utilized as earmarked for dumping because the site proposed on the western side falls in the forest for which Forest clearance was not obtained. The dump on the south eastern side was not utilized as the mining was not carried out in the proposed Block F1. However the existing dumps were provided with retaining wall and garland drains. Part of the dump has been screened to obtained saleable mineral as a part of dump working.

**e) Afforestation programme:****Commitment:**

As per the approved scheme of mining it has been proposed to cover an area of 11.68 hectares under afforestation programme.

**Compliance:-**

The plantation programme has been proposed in the scheme period.

Year	Proposed		Actual		
	Greenbelt/Avenue/ Dump Plantation		Greenbelt / Avenue / block / Dump Plantation (In Ha)		
	Extent (Ha)	Saplings	Extent (Ha)	Saplings	Location
1 <sup>st</sup> year 2007-2008	Nil	Nil	3.80	8600	Safety zone Plantation
2 <sup>nd</sup> year 2008-2009	2.05	5125	3.0	11000	Safety zone Plantation & gap filling plantation
3 <sup>rd</sup> year 2009-2010	2.05	5125	8.0	27600	Safety zone Plantation, gap filling plantation & Social forestry.
4 <sup>th</sup> year 2010-2011	3.87	9175	7.0	28000	Avenue plantation, Dump stabilization, gap filling plantation and Social forestry
5 <sup>th</sup> year 2011-2012	3.91	9775	4.0	10000	Avenue plantation, Dump stabilization, gap filling plantation & Social forestry
<b>Total</b>	<b>11.68</b>	<b>29200</b>	<b>25.80</b>	<b>82000</b>	

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**4.0 Closure Plan:****4.1 Mined – Out Land:**

A total of 117.27 Ha of land will be degraded by mining during the scheme period. 32.253 Ha will be utilized for dumping which includes both new dumps and the existing dumps. The dump is only a temporary dump and will be re-handled for backfilling the worked out pit during the conceptual period. Presently are no mined out land available for reclamation within the lease area. However from the fourth year (2015-16) onwards part of Kalimali pit will be used to temporarily store the waste generated during the fourth (2015-16) and fifth year (2016-17) of the scheme period.

**Other than quarry area**

About 6.752 ha of mineral separation plant, 15.74 has of safety zone plantation, 0.20 ha of infrastructure, 10.564 Ha of road, 0.834 ha of township and 0.89 ha of retaining wall

**4.2 Water Quality Management:****4.2.1 Water Regime****4.2.1.1 Surface Water Bodies**

Bethajari Nallah is the only nallah which is flowing along the eastern boundary of the mining lease which will not be affected by the mining operation. Few seasonal streams flow through the lease. However the measures will be taken to ensure that the surface water quality is not affected due to the mining operations by constructing necessary guard walls, check dams, etc. Surface run off of the mines will be directed to the settling ponds.

**4.2.1.2 Ground Water**

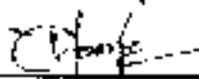
Ground water table is encountered at 517 MSL. There shall be not be any disturbance on the existing drainage pattern due to the mining activities. However due to mining activities, the ground water table will be encountered during the conceptual period. The lease is due for renewal in 2017. Hence during this lease period the mining activities will not touch the water table.

**4.3 Air Quality Management:**

Ambient Air Quality (AAQ) in respect of suspended particulate matter (SPM), PM10, PM 2.5, sulphur dioxide (SO<sub>2</sub>), oxides of Nitrogen (NO<sub>x</sub>) and CO are monitored regularly. AAQ monitoring was done at six selected locations in the study area, taking into consideration all possible intervening factors and the criteria for selection of sampling stations relating AAQ monitoring and the Indian Standards and Emissions Regulations published by notified the ministry of Environmental & forest, Central Pollution Control Board (CPCB). The monitoring has carried out in all the seasons. Water is being sprinkled by installing fixed sprinklers in the processing plant area, by fixed sprinklers along the haul road and by water tanker of 35 KL capacity.

A1 & A2 represent the core zone and the remaining 4 stations mention the buffer zone. From the values it can be noticed that the values are well within the permissible limits.

  
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Periodical monitoring of the air is being carried out in 6 locations, which are given in Annexure - 13

Id	SPM			PM 10			PM 2.5			SO <sub>2</sub>			NO <sub>x</sub>		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
A1	392.56	129.6	360.03	92.03	71.62	82.68	33.28	21.65	28.92	8.16	3.12	4.62	23.02	2.94	13.09
A2	404.00	291	353.03	91.02	67.9	76.88	33.82	20.13	27.47	6.10	4.1	5.16	18.07	12.0	15.6
A3	186.00	64.04	135.47	61.02	52.9	57.79	21.97	16.16	19.57	4.90	2.04	3.62	12.02	3.48	8.03
A4	196.3	107.32	142.99	62.81	21.97	53.51	20.76	8.23	16.88	4.50	2.04	3.35	11.1	3.09	8.04
A5	118.35	91.14	105.66	43.58	29.86	36.31	14.95	9.61	11.02	7.25	3.8	5.0	21.80	8.1	13.24
A6	141.00	96.4	104.89	57.80	37.4	44.77	20.70	11.35	15.36	6.40	3.3	4.22	14.68	7	10.19

#### 4.4 Waste Management:

The proposed mining activity is likely to generate 6.30 Million Cu.M waste in 5 years of scheme period and shall be dumped in the North Eastern and Eastern part of the area earmarked for dumping. Water shall be sprinkled at a regular interval for compactness of dump as well as to prevent creation of dust at the dumping site. The dump management proposed to be followed will make the solid waste pollution issue virtually irrelevant.

The area proposed for dumping is already proved to be barren drilling bore holes. The materials shall be transported to the dumping site by dumper. The dump shall be covering a an area of about 7.35 Ha with maximum height 30 meters. The ultimate dump slope be maintained at 28° with individual terrace at 37°. Each terrace should have broad slope with catch drains at the inward side of terrace. The catch drains of the individual surface should be connected to the garland drain outside the periphery of the dump. These catch drains should preferably have half concrete open pipes followed by settling tanks to avoid wash offs. Each terrace have a provision of berms the outer end to reduce gully formation due to rain water wash offs. The space left between different phase will be covered by top soil for growing plants in these areas. Moreover dump slopes will also be utilized for plantation in order to prevent damage to the dumps by the surface run-off (rain) water.

#### Dump Management:

- The area for the dumping will be demarcated on the field which will be non mineralized zone.
- Dumping will be by retreating method and will be in 3 stages each of 200000 Cu.M.
- Each terrace shall have inward slope with catch drains at the inward side of terrace.
- The catch drains of the individual terrace shall be connected to the garland drain outside the periphery of the dump.
- These catch drains shall constructed followed by settling tanks to avoid wash offs.
- Dump stabilisation will be carried out from the inactive side of the dump
- Each terrace have a provision of berms at the outer end to reduce gully formation due to rain water wash offs.
- Inactive Dump slopes will be covered with coir matting and mixed grass seeds will be sprayed for additional stability of the dumps.

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**4.5 Top Soil Management:**

During the Scheme of Mining no fresh area will be broken up. Hence the generation of top soil will not be there.

**4.6 Tailing Dam Management:**

No beneficiation is involved. Hence the question of tailing management does not arise.

However the garland drains around pit and dumps shall be constructed. In addition check dams, settling ponds and afforestation on existing dumps, safety zone has been proposed. These measures shall be taken to ensure that the surface water quality in the project area is within permissible limit in respect of all the parameters for all four seasons.

**4.7 Infrastructure:**

The existing infrastructure facilities such as road and water supply sources etc., will not be disturbed and retained for future utilization.

**4.8 Disposal of Mining Machinery:**

There is no proposal of decommissioning of mining machineries as they will be shifted to other mines of the lessee.

**4.9 Safety & Security:**

As a measure of safety peripheral bund all along mine working will be formed. To avoid unauthorized entry to the excavated areas from the surface openings by general public, proper fencing will be made and also plantation will be raised all along the periphery of the worked out pit.

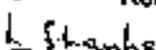
Presently sufficient safety measures are adopted during blasting. Safety zone plantation would be one all along the boundary to prevent access to the surface opening, excavation etc.

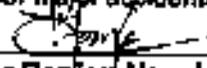
**Disaster management and risk assessment:**

Risk assessment is a process whereby risks are analyzed, assessed and risk management priorities are evaluated. It is defined as the characterization of the potential adverse effect to human health & environment due to environmental hazards.

**Objectives of Risk Assessment:**

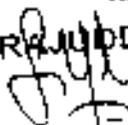
- Identifying hazardous activities.
- Assessment of risk level and severity in different operations.
- Identification of control measures.
- Reduce the impact of mishaps of all kinds.
- Reduce the inherent potential for major accidents.

  
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**Methodology of Risk Assessment:**

- Collection of information & identification of hazard.
- Classify their severity and probability of occurrence.
- Identification of exposed risks.
- Assess the risk and risk rating based on
  - Probability
  - Exposure
  - Consequence
- Prioritization of the risks
- Implementation of control measures.
- Monitoring risk assessment.
- Evaluation and correction.

Risk assessment is mainly based on the environmental impact of various parameters.

**i) Land Contamination :-**

The potential for contamination during operation of mine site is, waste rock dump, which regard as contaminated land.

**ii) Aquatic Toxicity:**

The risk assessment in aquatic toxicity systems is based on the total concentration in various chemical form or oxidation state. Iron ore does not contain appreciable concentration of toxic elements.

**iii) Acid mine Drainage:**

The mining of iron ore does not involved any processing operation by using chemicals. Hence there is no risk at mine site with regard to control of acid mine drainage.

**iv) Tailing Dam :-**

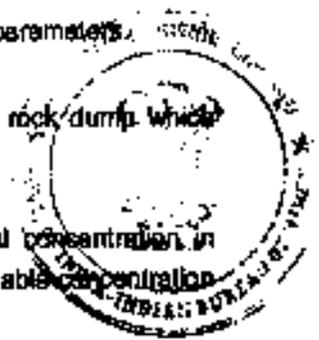
Tailings are usually generated in wet Beneficiation Plant and these Tailings are impounded in a Tailing Dam. As there is no proposal for wet Beneficiation plant at Balda Mines there is no requirement of Tailing Dam.

**v) Human Health :-**

During Environment Impact Assessment toxicity is nil. Hence there is no risk involved to human health due to iron ore mining operation.

Factors of risks involved due to human induced activities in connection with mining operations are 1) Removal of O.B. and side burden 2) Drilling 3) Blasting 4) Excavation of ore and 5) Transportation of ore.

Other factors due to natural activities are 1) fire 2) water inundation 3) electricity and 4) natural calamities.



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S.No	Factors	Causes of risks	Control measures
1	Removal of O.B	a) Top soil & O.B bench may slide due to its unconsolidated nature. b) Vibration due to movement of vehicles in the O.B benches	Over all O.B bench slope angle will be maintained not more than 37.5° Bench height shall not exceed 10 mtrs in O.B
2	Drilling	a) Due to high pressure of compressed air hoses may burst.	During preventive & Periodical maintenance and replacement of worn out accessories in the compressor and drill equipment. As per manufacturers recommendation rod to be replaced and bits will be changed.
3	Blasting	a) Fly rock, ground vibration and noise etc., b) Improper charging of explosives.	Burden and spacing will be kept optimum to reduce ground vibration, Fly rock. Explosive charge per delay. will be minimized.
4	Excavation of ore	a) Hauling and loading equipment are in such proximity while excavation. b) Swinging of bucket over the body of tipper. c) Driving by un-authorized person.	Operator shall not operate the machine when person & vehicles are in such proximity. Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground. Shall not allow any unauthorized person to operate the machine by effective supervision.
5	Transportation of ore	a) Operating the vehicle "nose to tail". b) Overloading of material. c) While reversal & overtaking of vehicle. d) Operator of truck leaving his cabin when it is loaded.	It will be ensured that all these causes will be nullified by giving training to the operators. No over loading. Audio visual reverse horn will be provided. Proper training will be given.

K. Shankar

K Shankar  
RCPMA/117/08/ANihar Rajendra Nayak  
RCPMA/117/08/A

for SERAJUDIN

11-13

Jt. Managing Partner

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RCPBBS/004/2010-A

6	Fire due to electricity and Oil	a) Due to the short circuit of cables & other electrical parts. b) Due to the leakage of inflammable liquid like diesel, oil etc.,	Commutator & electrical parts shall be cleaned frequently with the help of dry air blower. All fastening parts and places will be tightened.
7	Natural calamities	Unexpected happening	The mine management is capable to deal with the situation.

**Disaster Management Plan:**

The management is able to deal with the situation effectively to reduce confusion keeping in view of the likely sources of danger in the mine.

**Structure of the Disaster Management Plan:-****1) Out line of Disaster Management Plan :-**

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormalities in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

**2) System of Communication :-**

We have an internal communication system for the department head and to their line of command with telephone .And also we are having the telephone nos and addresses of adjoining mines, rescue station, police station, Fire service station, local hospital, electricity supply agency and standing consultative committee members.

**3) Consultative Committee:**

A standing consultative committee will be formed under the head of mines manager. The members consists of safety officer /medical officer/ Asst. manager/ public relation officer/ Foreman/ and environmental engineer.

The details of name of persons, with address, phone number and responsibilities given is tabulated below

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Y Nagendra  
RQP/BS/094/2018-A

S.NO	Name of the person	Designation	Address & Phone Number	Responsibility
1	Mr..P.K Dehuri	Mines Manager	House of Mr.Rajaram Flat No - 1 Near Tanya Hotel Joda. Mob - 8895156485	Chief Controller Emergency
2	Mr.P.K.Nanda	Sr.Mines Manager	Near Tarini Temple Saranda, Joda Mob - 8895221755	Controller
3	Mr.A.K.Sahoo	Mines Manager	At Po Bangore, Via Hatgarh, Dist Keonjhar, Phone 9439111322	Controller

#### 4) Facilities & Accommodation:

Accommodation and facilities for medical centre, rescue room and for various working groups will be provided.

#### 5) First Aid & Medical facilities:

The mine management is having first aid/ medical centre for use in emergency situation. All casualties would be registered and will be given first aid. The centre will have facilities for first aid & minor treatment, resuscitation, ambulance for transport. It will have proper telephone / wireless set for quick communication with hospitals where the complicated cases are to be sent.

#### 6) Stores and Equipment:

A detailed list of equipment available its type & capacity and items reserved for emergency.

#### 7) Transport Services:

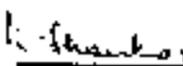
A well defined transport control system will be provided to deal with the situation.

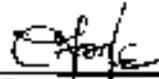
#### 8) Functions of Public Relation Group:

To make a cordial relation with government officials and other social service organization and working groups. To liaise with representatives of the mine to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. To ameliorate the injured, survivors and family members of affected persons by providing material, moral support and establishing contact with relatives of victims.

#### Emergency plan:

- 1) On realizing anything serious to have happened anywhere in the mine immediately the nearest mining official will be informed.
- 2) On being informed about the emergency it will be verified for the correctness of information and telephone in particular to the manager and other part of the mine and managers of adjoining mine so that persons may be withdrawn.

  
K Shankar  
RQP/MASH/17/28/A

  
Nihar Ranjan Nayak  
RQP/CAL/2012/03/A

  
Y Nagendra  
RQP/BSE/09/2010-A

For SERAFUDDIN  
  
Jt. Managing Partner

- 3) On receiving information of emergency intimation will be sent to the consultative committee which is already formed. Shift in- charge will ensure that all the materials and transport system to deal with emergency situation.
- 4) First aid facilities to be ready to receive the cases.
5. Economic repercussions of closure of mine and manpower retrenchments:
- 5.1 Number of local residents employed in the mine, status of the continuation of family occupation and scope of joining the occupation back:  
The lessee employs around 715 persons (Technical, Skilled, Semi-skilled and Unskilled) for mining and connected activities. The mining will continue throughout the year giving enough occupation for the people employed.
- 5.2 Compensation given or to be given to the employees connecting with sustenance of himself and their family members:  
The lessee will adhere by law prevailing at the time of discontinuance if such a need arise.
- 5.3 Satellite occupations connected to the mining industry - number of persons engaged therein continuance of such business after the mines close: **Not Applicable.**
- 5.4 Continued engagement of employees in the rehabilitation status of mining lease area and any other remnants activities: **Not applicable**
- 5.5 Envisaged repercussions on the expectation of the society around due to closure of the mine :  
In case of closure of the mining activity of this particular mine the labour force will be shifted to other mines of the company in the vicinity catering the needs of the plant.
- 6.0 Time scheduling for abandonment:  
Life of the mine for the lease under reference is about 20 years.

Proposal of reclamation: - There is no proposal for reclamation but temporary storage of waste shall start in the fourth year i.e 2015-16 year by filling the waste generated. The reclaimed portion of the pit will be stabilised and afforested during the conceptual period after complete refilling of the worked out Block. However the time schedule for abandonment of the mine is discussed below in brief.

APPROVED

For M. RAJUDDIN & CO.

Jt. Manager  
Shankar  
RQP/MAS/117/09/A

Nihar Ranjan Nayak  
RQPICAL/2012/0252/A

Y Nagendra  
RQP/ISS/084/2010-A

**Time Scheduling:**

Keeping in view the average production target at 15.0 MTPA the life of mines will be 20 years so the mines will be closed in the year of 2032. Scientific mining may result reclamation and rehabilitation including their protection, maintenance & monitoring from next five years onwards depending upon exploration out come so block wise reclamation and rehabilitation will be started in the year of 2015-16 simultaneously this method will be continuing till exhaust the mineral up to in the year of 2032 so there is no extra time will required for same but another one and half year is required for decommissioning, removal of infrastructure, removal of equipment & heavy machinery, site safety, reclamation /mitigation.

**7.0 Abandonment cost:**

Part of the worked out pit will be refilled from the fifth year of the plan period i.e 2016-17 onwards.

For final closure one and half year will be required tentatively for the purpose of decommissioning and reclamation & rehabilitation, to be done after cessation of mining & mineral processing operation.

**7.1 Manpower for Abandonment**

About One Hundred skilled/semi skilled and Un-skilled employees employed in the mine under the supervision of technical staff employed with the mines will be involved in the abandonment of the mining operations.

**7.2 Other Resources Required**

Men, Machines Money and Materials are required for the completion of job. Machines as given in Para 2.8 will be under deployment for back filling. Leveling of mined out area and terracing of waste dumps. Man power is given above in Para 6.2.

**Abandonment Cost**

The tentative cost of each important activity of abandonment (decommissioning reclamation & habitation etc.) has been indicated in the tables follows to have the idea of the funds that may be required for the final closure.

K. Shankar  
RQP/MS/197/2010-A

Nihar Ranjan Nayak  
RQP/MS/244/2013/A

Y Nagendra  
RQP/BBS/084/2010-A

SERAJUDIN  
11-17  
It. Managing Partner

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2012-13				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Construction of parapet walls / Retaining wall at toe of dumps (mtr)	710	3.55	
	3) Construction of settling pits & Garland drain of length.	750	3.75	
		1.No. of Settling Pit	0.5	
	4) De-silting of settling pits & Channels (post monsoon)	1	1.0	
5) Coir Geo-textile (Sqrm)	7000	8.05		
B) Run-off Management	Construction of Check Weirs / De-silting chambers	4	2.0	
C) Rehabilitation of barrier area within lease	1) Afforestation (Green Land Building) i.e. gap filling in safety zone area	5000	0.6	
D) Environmental Monitoring (Core Zone and Buffer Zone Separately)	1) Ambient Air Quality (Core Zone)	160	1.5	2 Stations, Monthly 8 samples, total Month 10
	1) Ambient Air Quality (Buffer Zone)	320		4 Stations, Monthly 8 samples, total Month 10
	2) Water Quality (Core Zone)	8	0.585	2 Station, 4 season
	2) Water Quality ( Buffer Zone)	48		10 Station, 8 season
	3) Noise Level Survey (Core Zone)	Monthly Once	0.25	—
	3) Noise Level Survey (Buffer Zone)	Monthly Once		—
	4) Ground Vibration (Core Zone)	Monthly Once	0.25	—
	5) Waste water quality	Fortnightly Once	0.12	—
6) Fugitive dust (core zone)	Fortnightly Once	0.05	—	

FOR SERAJUDDIN & CO.  
Jt. Managing Partner

K Shankar  
RQP/MAS/117/98A

Nihar Rajan Nayak  
RQP/CAL/291/2003/A

Y Nagendra  
RQP/BS/094/2018-A

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2013-14				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Construction of parapet walls / Retaining wall at toe of dumps (mtr)	900	4.5	
	4) Construction of settling pit & Garland drain etc	1000 mtr garland drain	5.0	
		1 no of linear de-silting pit	2.0	
	5) De-silting of settling pits & Channels	Regular @ post monsoon	1.0	
B) Run-off Management	6) Coir Geo-textile (Sq.m)	10000	10.00	
	Construction of Check weirs	4	2.0	
C) Rehabilitation of barrier area within lease	1) Afforestation (Green Land Building) i.e. gap filling in safety zone area	5000	0.6	
D) Environmental Monitoring (Core Zone and Buffer Zone Separately)	1) Ambient Air Quality (Core Zone)	160	1.5	2 Stations, Monthly 8 samples, total Month 20
	1) Ambient Air Quality (Buffer Zone)	320		4 Stations, Monthly 8 samples, total Month 10
	2) Water Quality (Core Zone)	8	0.58	1 Station, 4 season
	2) Water Quality ( Buffer Zone)	48		10 Stations, 4 season
	3) Noise Level Survey (Core Zone)	Monthly Once	0.25	
	3) Noise Level Survey (Buffer Zone)	Monthly Once		
	4) Ground Vibration (Core Zone)	Monthly Once	0.25	
	5) Waste water quality	Fortnightly Once	0.12	
	6) Fugitive dust (core zone)	Fortnightly Once	0.05	

K. Shankar

K Shankar  
RQP/MAS/117/06/ANihar Ranjan Nayak  
RQP/CAL/201/06/A

FOR SEBAUDDIN A. IS

Jt. Managing Partner

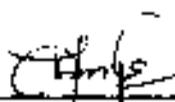
Y Nagendra

RQP/BBG/094/2010-A

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2014-15				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Stabilization of dumps with lease	1) Terracing	10 meter terrace of the dump will be done.		
	2) Construction of parapet walls / Retaining wall at terrace (mtr)	1700	17.00	
	5) De-silting of settling pits & Channels	Regular @ post monsoon	2.0	
	6) Coir Geo-textile (Sqmt)	17000	17.00	
B) Rehabilitation of barrier area within lease	1) Afforestation (Green Land Building) i.e. gap filling in safety zone area	5000	0.6	
C) Environmental Monitoring (Core Zone and Buffer Zone Separately)	1) Ambient Air Quality (Core Zone)	160	1.5	2 Stations, Monthly 3 samples, total Month 10
	1) Ambient Air Quality (Buffer Zone)	320		4 Stations, Monthly 3 samples, total Month 10
	2) Water Quality (Core Zone)	8	0.585	2 Station, 4 seasons
	2) Water Quality (Buffer Zone)	48		10 Station, 4 seasons
	3) Noise Level Survey (Core Zone)	Monthly Once	0.25	—
	3) Noise Level Survey (Buffer Zone)	Monthly Once		—
	4) Ground Vibration (Core Zone)	Monthly Once	0.25	—
	5) Waste water quality	Fortnightly Once	0.12	—
6) Fugitive dust (core zone)	Fortnightly Once	0.05	—	

FPT SERAJUDDIN & CO.  
  
 Jt. Managing Partner

K Shankar  
 RQP/MAS/117/08/A

  
 Nihar Rajan Nayak  
 RQP/CAL/291/2003/A

  
 Y Nagendra  
 RQP/BSJ/064/2010-A

Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2015-16				
Item	Details	Quantity	Expenditure In Lakhs	Remarks
A) Reclamation & Rehabilitation of Mined out Area	Back filling - No proposal	Temporary storage in the Kalimati - quarry		
B) Stabilisation of dumps with lease	1) Terracing	10 meter terrace of the dump will be done..		
	2) Construction of parapet walls / Retaining wall at terrace (mtr)	1700	17.00	
	3) De-silting of settling pits & Channels	Regular @ post monsoon	2.0	
	4) Coir Geo-textile (Sqm)	17000	17.00	
C) Rehabilitation of barrier area within lease	1) Afforestation (Green Land Bulking) i.e. gap filling in safety zone area	5000	0.6	
D) Environmental Monitoring (Core Zone and Buffer Zone Separately)	1) Ambient Air Quality (Core Zone)	160	1.5	Monthly 8 samples Core Zone April 10 10/10/15
	1) Ambient Air Quality (Buffer Zone)	320		
	2) Water Quality (Core Zone)	8	0.585	7 Station, 4 season
	2) Water Quality (Buffer Zone)	48		10 Station, 4 season
	3) Noise Level Survey (Core Zone)	Monthly Once	0.25	—
	3) Noise Level Survey (Buffer Zone)	Monthly Once		—
	4) Ground Vibration (Core Zone)	Monthly Once	0.25	—
	5) Waste water quality	Fortnightly Once	0.12	—
6) Fugitive dust (core zone)	Fortnightly Once	0.05	—	

*K Shankar*  
K Shankar  
RQP/MS/117/08/A

*Nihar Ranjan Nayak*  
Nihar Ranjan Nayak  
RQP/CA/201/2003/A

*Y Nagendra*  
Y Nagendra  
RQP/BBS/04/2010-A

SERAJUDIN & CO. PT. 21

*Serajudin*  
It. Managing Partner

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Information on Targets Made of Protective Measures Undertaken for Environmental Protection in during 2016-17				
Item	Details	Quantity	Expenditure in Lakhs	Remarks
		Proposed	Proposed	
A) Reclamation & Rehabilitation of Mined out Area	Back filling - No proposal	Temporary storage in the Kallmatl - quarry		
B) Stabilization of dumps with lease	1) Terracing 2) De-silting of settling pits & Channels	10 meter terrace of the dump will be done. Regular @ post monsoon	2.00	
C) Rehabilitation of barrier area within lease	1) Afforestation (Green Land Building) i.e. gap filling in safety zone area	5000	0.6	
D) Environmental Monitoring (Core Zone and Buffer Zone Separately)	1) Ambient Air Quality (Core Zone)	160	1.5	2 Stations, Monthly 8 samples, total Month 16
	1) Ambient Air Quality (Buffer Zone)	320		4 Stations, Monthly 8 samples, total Month 32
	2) Water Quality (Core Zone)	8	0.585	2 Station, 4 season
	2) Water Quality ( Buffer Zone)	48		10 Station, 4 season
	3) Noise Level Survey (Core Zone)	Monthly Once	0.25	—
	3) Noise Level Survey (Buffer Zone)	Monthly Once		—
	4) Ground Vibration (Core Zone)	Monthly Once		0.25
	5) Waste water quality	Fortnightly Once	0.12	—
6) Fugitive dust (core zone)	Fortnightly Once	0.05	—	

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K Shankar  
ROP/MS/117/98/A

Nihar Ranjan Nayak  
ROP/CA/29/2003/A

Y Nagendra  
ROP/BBS/99/2010-A

However, tentative cost of each of important activity of abandonment e.g. decommissioning, reclamation & rehabilitation etc have been indicated to have an idea about the funds that may be required for the final closure is indicated below. This included the amount proposed to be spent for reclamation & rehabilitation during the PMCP period i.e. the present plan period.

- 1) Decommissioning / Demolition :  
Not applicable
- 2) Removal of infrastructure  
No permanent structures are proposed for office infrastructures. Containers will be converted into office, first aid centre etc which will be dismantled and sent to other mines of the lessee after the mining operation ceases.
- 3) Removal of equipments and heavy machineries :  
The crushers and screens will be dismantled and reused in the other mines and the civil structures will be demolished. The HEMM deployed will be shifted to other mines or sold.
- 4) Site Safety:  
Fencing  
Fencing at top of workings :  
Total length of fencing - 9000 m  
No. of workers required for fencing including fixing of granite poles @ 3m interval and 3 rows of barbed wire  
@ 20 m/worker/day - 450 man days  
@ 30 workers/day - 15 days  
Cost of granite poles - 3000\*150=Rs.4,50,000  
Cost of 1 kg barbed wire(6m per Kg) - Rs.100  
Cost of barbed wire - 4500\*100= 4,50,000  
Cost of labourers - 15\*30\*200= Rs.90,000  
Total cost for Fencing - Rs 9,90,000
- 5) Remediation / Mitigation measures:  
Total cost required for constructing check-dam, garland drain and reclamation and rehabilitation of dumps through plantation are calculated as follows :  
i) Construction of check-weirs/de-silting chambers:  
Total 8 no's of check-weirs/de-silting chambers shall be made. The size of the check-weirs/de-silting chambers will be 2/3 rd of the drain. Total amount required will be 400000 @ 50,000/- per one structure.  
ii) Providing garland drain:  
Taking an average length of 1750m, total amount required will be Rs.8, 75,000/- @Rs.500/- per meter. Dimension of the garland drain will be of 1750m (length) x 2m (width) x 1m (depth).

K Shankar

K Shankar  
RQP/MASM/17/08/ANihar Ranjan Nayak  
RQP/CAL/20/2003/AY Nagendra  
RQP/BBS/094/2016-A

For SERAJUDDIN &amp; CO'S

Jt. Managing Partner

- iii. **Settling Pit**  
1 no of settling pit & one number of linear de-silting pit will be made. An amount of Rs.2, 50,000/- may be kept for the purpose.
- iv. **Retaining Wall**  
Retaining wall for a length of 5010 m having a width of 1m and height of 2 m is planned all along the foot of the dumps & also at terraces. The total cost for constructing retaining wall is Rs.42,05000
- v. **De-silting**  
De-silting of settling pits & channels will be done every year. The total amount required for this work will be 8,00,000
- vi. **Monitoring**  
Cost of Environmental monitoring per annum = Rs 3.00 lakhs  
(AAQ+Noise+water)
- vii) Total expenses shall be Rs.66,30,000/-
- viii) Standard cost norm for enrichment of plantation per Ha is as under

a) **Pre-planting & nursery**

S/No.	2500 plants/Ha Item of work	Wage rate Rs.150/- Man days Required	Amount (in Rs.)
1	Site preparation	15	2250.00
2	Alignment & stacking	10	1500.00
3	Nursery cost of 2500 seedlings @Rs.5.00	—	12500.00
4	Piling	15	2250.00
Sub Total :			18500.00

b) **Creation and maintenance**

1.	Carrage & planting	10	750.00
2.	Weeding, soil working and manuring (thrice)	7	1050.00
3.	Application insecticides (thrice)	3	450.00
4.	Fireline tracing inspection path	4	600.00
5.	Cost of fertilizer & insecticides	Lump sum	2000.00
6.	Watch & ward	2	300.00
Sub-Total :			5150.00
Grand total ;			23,650

- (6). **Reclamation and rehabilitation of workings:**
- Quantity of waste available for reclamation = 36.85 Ml.T or 16.75 MCM
- i) Cost of refilling = Rs 4187.5 Lakhs/-  
@ Rs.25.00/cu.m
- ii) Cost required for leveling and compaction of 150 Ha = 150x Rs.1000 = Rs.150000/- or Rs1.50 lakhs  
mined out area @ Rs.1000/Ha.

For SERAJUDDIN & CO.  
Jt. Managing Partner

K Shankar  
RQP/MAS/117/98/A

Nihar Ranjan Nayak  
RQP/CAL/26/2003/A

Y Nagendra  
RQP/BBS/084/2010-A

- |      |   |   |  |
|------|---|---|--|
| iii) | Cost required for rehabilitation by way of vegetation in back filled area over 256.776 Ha @ Rs.23850/- Ha | = | 256.776 x Rs.23850/-                     |
|      |   | = | Rs. 60.72 l- lakhs                       |
| iv)  | Total amount required For reclamation and Rehabilitation  | = | Rs 4187.5 lakhs<br>+Rs.1.50 +60.72 lakhs |
|      |   | = | Rs.4249.72/- lakhs                       |
- (7) Maintenance / monitoring during and after closure operation:  
Not applicable
- (8) Retrenchment and relocation cost:  
Not applicable
- (9) Research and development:  
Not applicable
- (10) Administrative/management:
- i) Fees to be paid for preparation of closure plan procurement of information and data from various institution/organization is Rs.1,00,000/-
  - ii) Salary and wages of at least Five(5) supervisory and management personnel for maintenance and monitoring activities for 2 years Rs.7,20,000/- @ Rs.6,000/- per month per person in an average.
  - iii) Total amount requirement under administrative expenditures is Rs.1,00,000/- + Rs.7,20,000/- = Rs.8,20,000/-

K. Shankar

K Shankar  
RQP/MAB/117/98/A

Nihar Ranjan Nayak

RQP/MSB/117/98/A

11-25

For SERAJUB  
Jt. Managing Partner

Y Nagendra

RQP/EBS/094/2010-A

## 8.0 Financial Assurance:

The extent used for mining and allied activities during the plan period is given below

Sl No	Head	Area put on use at start of plan (Ha)	Additional requirement during plan period (Ha)	Total (Ha)	Area considered as fully reclaimed & rehabilitated (Ha)	Net area considered for calculation (Ha)
1	Area of excavation	66.817	50.853	117.270	Nil	117.270
2	Storage of top soil	Nil	Nil	Nil	Nil	Nil
3	Overburden/dump	31.203	1.050	32.253	Nil	32.253
4	Mineral Storage	1.196	0	1.196	Nil	1.196
5	Infrastructure(Workshop/Building)	0.200	2.800	3.000	Nil	3.000
6	Roads	7.210	1.800	9.010	Nil	9.010
7	Railways	Nil	Nil	Nil	Nil	Nil
8	Green belt (Safety Zone)	25.800	22.806	48.286	Nil	48.286
9	Tailing pond	Nil	Nil	Nil	Nil	Nil
10	Effluent treatment plant	Nil	Nil	Nil	Nil	Nil
11	Mineral Separation plant	Nil	7.610	7.610		7.610
12	Magazine	0.189	Nil	0.189	Nil	0.189
13	Temporary Colony	0.834	Nil	0.834	Nil	0.834
14	Others (Retaining wall, check dams)	0.882	0.328	0.890	Nil	0.890
15	Area utilized	133.811	86.847	220.458	Nil	220.458
16	Area for future plantation in Safety Zone	22.806	-	-	-	-
17	Area which will remain for future exploration	179.377		179.377	Nil	179.377
	Total	335.594	-	335.594	Nil	335.594
	<b>GRAND TOTAL</b>	<b>A</b>	<b>B</b>	<b>C=A+B</b>	<b>D</b>	<b>E=C-D</b>

As per Mineral Conservation and Development (Amendment) Rules - 2003 under Rule 23 (F) the lessee will have to provide financial assurance of Rs.25,000/Ha for the area utilized since the area falls in A-Category mine. The financial assurance for 220.458 Ha works out to Rs.55,11,450/ (Rupees Fifty Five Lakhs Eleven Thousand Four Hundred and Fifty only). The lessee will pay the financial assurance at the time of the submission of final copies of mine plan for approval.

Date: 27.03.12

Place: Dhanubaneswar

*FOR SERAJUDDIN*  
Jt. Managing Partner

*K Shankar*  
K Shankar  
RDP/MASH/17/98/A

*Nihar Ranjan Nayak*  
Nihar Ranjan Nayak  
RDP/CAL/2012/983/A

11-26

*Chui*  
27/4/12  
Chief Controller of Mines (Central Zone)

भारतीय खान पट्टा गण्डरा  
Indian Bureau of Mines  
RDP/MS/2010-A

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

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सत्यमेव जयते

ONE

HUNDRED RUPEES

भारत INDIA

INDIA NON JUDICIAL

उड़ीसा ORISSA

Form No.

D 435417

The Regional Controller of Mines  
Indian Bureau of Mines  
EMaluni Complex, 2<sup>nd</sup> Floor,  
308, District Centre,  
Chandrasekharpur  
Bhubaneswar-751016

RG NO.0565712BG000021

DATE NO. 1/3

Dear Sirs,

Guarantee No	:	0665712BG0040091
Amount of Guarantee:	:	Rs. 55,11,450/-
Guarantee cover:	:	From 12.04.2012 to 31.03.2017
Last date for lodgments of claim:	:	31.3.2017

This deed of Guarantee executed on 12th Day of April, 2012 by the State Bank of India, constituted under the SBI Act, 1955 having its Registered Office at Mumbai and amongst other places, a Branch at Commercial Branch, IDCOL House, Unit-2I, Ashok Nagar, Bhubaneswar-751 009 (hereinafter referred to as 'the Bank') in favour of Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar (hereinafter referred to as 'the Beneficiary') for an amount not exceeding Rs. 55,11,450/- (Rupees Fifty five lacs eleven thousand four hundred fifty Only ) as the request of M/s Sarajuddin & Co. (hereinafter referred to as 'the Contractor/s')

This Guarantee is issued subject to the condition that the liability of the Bank under this Guarantee is limited to a maximum of Rs 55,11,450/- (Rupees Fifty five lacs eleven thousand four hundred fifty Only ) and the Guarantee shall remain in full force up to 31.3.2017 and cannot be revoked on or before 31.3.2017 (last date of claim) by the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar in writing

APPROVED

SARAJUDDIN & CO.  
H. Managing Partner

Merghana Sahoo  
D 15002

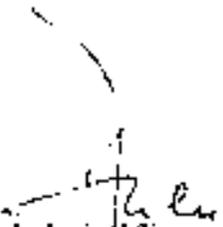
## BANK GUARANTEE & CO-ACCEPTANCE BOND

1. The Agreement on production of a Bank Guarantee for Rs 55,11,450/- (Rupees Fifty five lacs eleven thousand four hundred fifty only) under Rule 23F of MCDR, 1988.
2. We, State Bank of India Commercial Branch, Bhubaneswar at the request of M/s Serajuddin & Co. (Lessee) do hereby undertake to pay to the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar, or any other authority nominated by the Controller General, Indian Bureau of Mines an amount not exceeding Rs. 55,11,450/- (Rupees Fifty five lacs eleven thousand four hundred fifty only) against any loss or damage caused to or suffered or would be caused to or suffered by the Government or towards non-compliance of provisions of Rule 23A, B & 23E of MCDR, 1988 i.e. Mine Closure Plan/Progressive Mine Closure Plan approved in respect of mining lease for Iron ore over an area of 335.594 Hectr. granted by State Government to M/s Serajuddin & Co (lessee) situated in Sol Toposheet No. 73 G/S at Balda, Kalimati and Nayagarh etc. Villages, Champua Taluka, Keonjhar District, Orissa State by reason of any breach by the said lessee of any of the terms or conditions contained in the Mine Closure Plan/ Progressive Mine Closure Plan.
3. We, State bank of India, Commercial Branch Bhubaneswar, do hereby undertake to pay the amounts due and payable under this Guarantee without any demure, to the authority merely on demand from the Regional Controller General, Indian Bureau of Mines, Bhubaneswar or any other officer authorized by the Controller General, Indian Bureau of Mines stating that the amount claimed is due by way of loss or loss of damage caused to or would be caused to or suffered by the Government by reason of breach by the said lessee or any of the terms or conditions contained in the mining plan/ mining scheme or by reason of the Lessee's failure to perform the said Mine Closure Plan/ Progressive Mine Closure Plan. Any such demand made on the Bank under this Guarantee. However our liability under this Guarantee shall be restricted to an amount not exceeding Rs 55,11,450/- (Rupees Fifty five lacs eleven thousand four hundred fifty only).
4. We undertake to pay to the authority on a demand from the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar or any other officer authorized by the Controller General, Indian Bureau of Mines or Govt. of India any money so demanded notwithstanding any dispute or disputes raised by the Lessee in any suit or proceedings pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and Lessee shall have no claim against us for making such payment.
5. We, State bank of India Commercial Branch Bhubaneswar further agree that the guarantee herein contained shall remain in full force and effect during the period up to the end of the Mining plan/Scheme of Mining period of five years that would be for the performance of the said Agreement and that shall continue to be enforceable till all the dues of the Government under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged till Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar, or any other officer authorized by the Controller General, Indian Bureau of Mines certifies that the terms and conditions of the said Progressive Mine Closure Plan/Final Mine Closure Plan have been fully and properly carried out by the said lessee and accordingly discharge this guarantee. However, unless a demand or claim under this guarantee is made on us in writing on or before the 31.3.2017. We shall be discharged from all liability under this Guarantee thereafter.

OF SERAJUDDIN & CO.  
Jt. Managing Partner

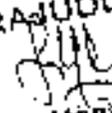
Malika  
"Archana Sahoo"

- 6. We further agree that the Regional Controller of Mines, Bhubaneswar or any other officer authorized by the Controller General, Indian Bureau of Mines, shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Lessee from time to time or to postpone for any time or from time to time any powers exercisable by Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar against the said Lessee and to forbear or enforce any of the terms and conditions relating to the said agreement, we, State Bank of India shall not be relieved from our liability by reason of any such variation or extension being granted to the said Lessee or for any forbearance, act or omission on the indulgence by Regional Controller of Mines, Indian Bureau Mines, Bhubaneswar to the said Lessee or any matter or thing whatsoever which under the law relating to sureties would but this provision have effect of so relieving us.
- 7. This Guarantee will not be discharged due to the change in the constitution of the Bank or the Lessee.
- 8. We, State Bank of India hereby undertake not to revoke this Guarantee during its currency except with the previous consent of the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar in writing.
- 9. Notwithstanding anything contained herein:
  - (a) Our liability under this Bank Guarantee shall not exceed Rs. 55,11,450/- (Rupees Fifty five lacs eleven thousand four hundred fifty only)
  - (b) The Bank Guarantee shall be valid upto 31.3.2017
  - (c) We are liable to pay the guarantee amount or any part thereof under this bank guarantee only and only if you served upon us a written claim or demand on or before 31.03.2017
- 10. If the bank guarantee is to be en-cashed through the court, in that case the Bhubaneswar Court will have jurisdiction
- 11. In witness whereof, the Bank through its authorized officer has set its hand and stamp on this 12<sup>th</sup> Day of April, 2012 at Bhubaneswar.

  
Authorized Signatory

  
Authorized Signatory

Total paid to date  
G 15602

For SERAJUDDIN & CO.  
  
Jt. Managing Partner

