

भारत सरकार
खान मंत्रालय
भारतीय खान ब्यूरो
खान नियंत्रण और खनिज संरक्षण प्रभाग
(मध्य अंचल)



GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
Mines Control & Conservation of
Minerals Division (Central Zone)

संख्या/No.

314(3)/2006-MCCM(C)/MP-4

दिनांक/Dated 15.9.06

To,

Shri J. Mishra,
Deputy General Manager(Geology),
Power of Attorney Holder,
The Orissa Mining Corporation Ltd.,
OMC House, Bhubaneswar-751001

Sub. : Approval of Mining Plan alongwith Progressive Mine Closure Plan in respect of Kodingamali Bauxite Deposit over an area of 447.25 hectares in Koraput District of Orissa State in favour of M/s Orissa Mining Corporation Ltd. submitted under rule 22 of MCR, 1960.

Reference:- 1. Your RQP's letter No. Nil dated 2.1.2006 received on 31.5.2006,
2. This office letter of even no. dated 10.8.06.
3. Your letter No. 17087/OMC/2006 dated 29.8.06.
4. This office letter of even no. dated 1.9.06.
5. Your letter No.17908/OMC/Geo dated 5.9.06.

Sir,

In exercise of the powers conferred by Clause (b) of Sub-Section(2) of Section 5 of Mines & Minerals (Development & Regulation) Act, 1957 read with Government of India Order No.S.O.445(E) dated 26.4.1987, I hereby approve the Mining Plan in respect of Kodingamali Bauxite Deposit over an area of 447.25 ha. in Koraput District of Orissa in favour of M/s Orissa Mining Corporation Ltd. submitted under Rule 22 of MCR 1960 on the following conditions :-

- i) This mining plan is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.
- ii) It is clarified that this approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development & Regulation) Act, 1957 or the Mineral Concession Rules, 1960 and any other laws
- iii) It is clarified that this approval of the mining plan is subject to the provision of Forest (Conservation) Act 1980, Forest Conservation Rule 1981 and other relevant statutes, order and guidelines as may be applicable to the lease area from time to time.
- iv) It is further clarified that the approval of Mining Plan is subject to the provisions of the Mines Act 1952 and Rules & Regulations made there under including submission of notice of opening, appointment of Manager and other statutory officials.

- v) The mining plan is approved without prejudice to any order or direction from the Court of competent jurisdiction.
- vi) Your attention is invited to the Supreme Court interim order in W.P.(C) No.202 dated 12.12.96 for compliance. The approval of Mining Plan is, therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable.
- vii) The lessee should submit the financial assurance to the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar before executing the mining lease deed as per Rule 23(F)(3) of Mineral Conservation & development Rules, 1988.
- viii) A copy of Environment Impact Assessment - Environment Management Plan (EIA-EMP) as approved by MOEF (Ministry of Environment & Forest) shall be submitted to IBM immediately after approval of MOEF.
- ix) The feasibility study of beneficiation of partially lateritised Khondalite and Kaolinised Khondalite which have high alumina content should be taken up within a period of three years of commencement of mining operation from an institute of national repute.
- x) The Environmental Monitoring Cell shall be established by the company. This Environmental Monitoring Cell of the company, shall continue monitoring ambient air quality, dust-fall rate, water quality, soil sample analysis and noise level measurements at various stations established for the purpose both in the core zone and buffer zone as per requirement of Environment Guidelines and keeping in view IBM's circular No.3/92 & 2/93 season wise every year or by engaging the services of an Environmental Laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer, on demand.

Yours faithfully,

sd/-

(C.P. Arishesh)

Chief Controller of Mines

Encl: Two copies of approved mining plan.

Copy for information to :

1. The Director of Mines, Directorate of Mines, Govt. of Orissa, Heads of Department Building, New Capital, Bhubaneswar-751001.
2. The Director of Mines Safety, Directorate General of Mines Safety, Bhubaneswar Region, Plot No.L-1, Nayapalli, P.O. RRL Campus, Bhubaneswar-751013. alongwith a copy of approved Mining Plan.
- ✓ 3. Shri Arindam Dash, RQP, M/s Alpha Consultants, B-403, Okilbag Enclave, Laxmi Sagar, Cuttack Road, Bhubaneswar-751006.

(S.S. Sapkal)

Asstt. Controller of Mines



भारत सरकार
खान मंत्रालय
भारतीय खान ब्यूरो
क्षेत्रीय खान नियंत्रक का कार्यालय

REGD. PARCEL

E-mail: ro.bhubaneswar@ibm.gov.in

No. MPM/FM/18-ORI/BHU/2015-16 /110

Plot No. 149, Pokhariput
Bhubaneswar – 751 020
Date: 11.04.2016

To

The Managing Director,
M/s Odisha Mining Corporation Ltd,
OMC House, Bhubaneswar,
Odisha- 751001

Sub: Approval of Modification of approved Mining Plan of Kodingamali Bauxite Mine along with Progressive Mine Closure Plan (PMCP), over an area of 428.075 Ha. in Rayagada & Koraput districts of Odisha State, submitted by M/s Odisha Mining Corporation Ltd under Rule 22 (6) of MCR, 1960.

Ref: - i) Your letter No. 16570/PMC/OMC/2015 dated 22/12/2015.
ii) This office letter of even no. dated 23.12.2015.
iii) This office letter of even no. dated 30.12.2015 addressed to the Director of Mines, Govt. of Odisha, copy endorsed to you.
iv) This office letter of even no. dated 20.01.2016.
v) Your RQP's letter No. 11.16.Q78P.01 dated 15.02.2016.
vi) This office letter of even no. dated 02.03.2016.
vii) Your RQP's letter No. 11.16.Q78P.02 dated 28.03.2016.

Sir,

In exercise of the power conferred by Clause (b) of Sub-Section (2) of Section 5 of Mines & Minerals (Regulation & Development) Act, 1957 read with Government of India Order No. S.O. 445 (E) dated 28.04.1987, I hereby APPROVE the Modification to Approved Mining Plan including Progressive Mine Closure Plan of Kodingamali Bauxite Mine of M/s Odisha Mining Corporation Ltd over an area of 428.075 Ha. in Rayagada & Koraput districts of Odisha State submitted under Rule 22 (6) of MCR, 1960 read with Rule 17(3) of MCR, 2016. This approval is subject to the following conditions:

- I. The Modification to Approved Mining Plan is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
- II. The proposals shown on the plates and/or given in the document is based on the lease map /sketch submitted by the applicant/ lessee and is applicable from the date of approval.
- III. It is clarified that the approval of aforesaid Modification to Approved Mining Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act, 1957, or the

Mineral Concession Rules, 1960 and any other laws including Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 or the rules made there under, Mines Act, 1952 and Rule & Regulations made there under.

- IV. Indian Bureau of Mines has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the boundaries of the leasehold shown on the ground with reference to lease map & other plans furnished by the applicant / lessee.
- V. At any stage, if it is observed that the information furnished, data incorporated in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
- VI. If the approval conflicts with any other law or court order/ Direction under any statute, it shall be revoked immediately.
- VII. Financial Assurance for an amount of Rs. 15,30,925/- to be submitted before execution of the mining lease deed.
- VIII. ML boundary pillars to be posted and Photographs of all boundary pillars and coordinates (Latitude-Longitude) of the same to be submitted to this office before commencement of the mining operations.

Encl: - One copy of approved
Modification to Approved
Mining Plan.

भवदीय / yours faithfully,


(M BISWAS)

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

Copy for kind information to:-

1. Shri P K Bhattacharjee, Key Person, M/s MECON Ltd, P.O – Doranda, Ranchi, Jharkhand - 834002.
2. The Director of Mines, Directorate of Mines, Government of Odisha, Heads of the Department Building, New Capital, Bhubaneswar- 751001, Odisha along with one copy of approved Modification to Approved Mining Plan by **REGISTERED PARCEL**.

1
(M BISWAS)

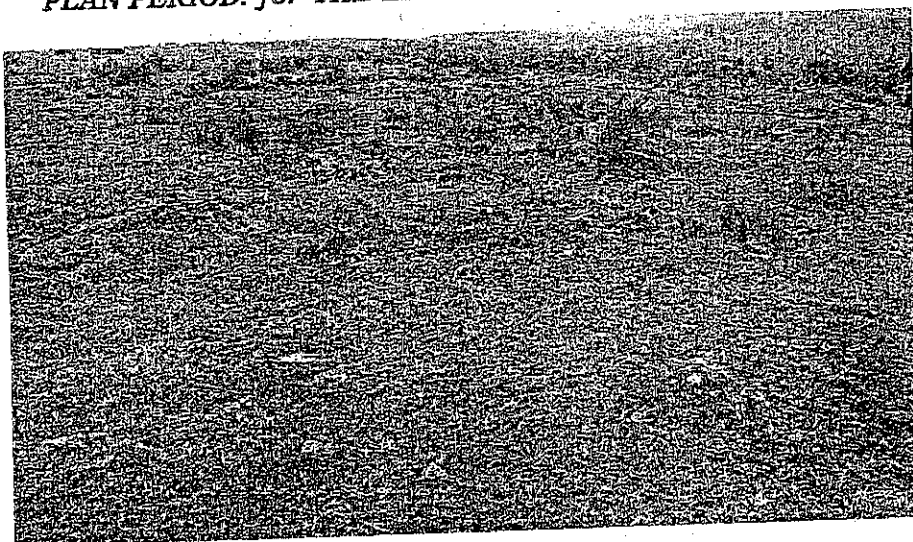
क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

**MODIFIED MINING PLAN
&
PROGRESSIVE MINE CLOSURE PLAN**

(UNDER RULE 22(6) OF MCR 1960 & 23(B) OF MCDR 1988)

**VOLUME - I (TEXT)
IN RESPECT OF KODINGAMALI LEASE**

**LEASE AREA: 428.075 HECTARES
FOREST: 428.075 HECTARES, NON FOREST: NIL HECTARES
MINERAL: BAUXITE
VILLAGE: KODINGAMALI, DISTRICT: RAYAGADA & KORAPUT
STATE: ODISHA
CATEGORY: FULLY MECHANISED (FM)
LEASE PERIOD: TO BE EXECUTED
PLAN PERIOD: for THE LEASE PERIOD TO BE EXECUTED**



APPLICANT

**ODISHA MINING CORPORATION LIMITED
OMC HOUSE, POST BOX NO. 34
BHUBANESWAR - 751001 (ODISHA)**

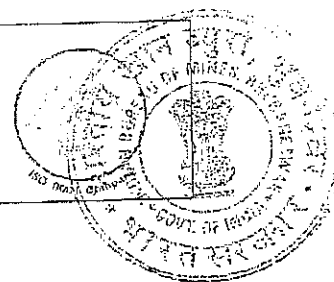
PREPARED BY

**MECON LIMITED, RANCHI - 834002, JHARKHAND
REG.NO. RQP/RNC/113/2004/B VALID UPTO 16.12.2017**

Approved vide letter no:-
MPM/PM/28-OT/PHU/2015-16
dated 11.04.2016.



MODIFIED MINING PLAN
KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.)
LESSEE: ODISHA MINING CORPORATION LIMITED
RQP : MECON LIMITED



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Odisha Mining Corporation Limited

(A GOLD CATEGORY STATE PSU)

CONSENT / UNDERTAKING / CERTIFICATE FROM THE LESSEE

01. The Modified Mining Plan of Kodingamali Buaxite lease over an area of 428.075 hectares in Kodingamali RF & Kodinga PRF, Dist. Rayagada & Koraput, Odisha state belonging to M/s Odisha Mining Corporation Limited has been prepared under Rule 22(6) of MCR 1960 & 23(B) of MCDR 1988 by RQP, M/s MECON Limited, Regn. No. RQP/RNC/113/2004/B.

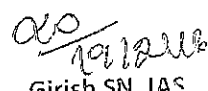
This is to request the Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar to make any further correspondence regarding any correction of the Modified Mining Plan with the said recognized person at his address below:

MECON Limited, P.O – Doranda, Ranchi – 834002, Jharkhand
Tel. 0651 - 2481093, 2483645 FAX. 0651 - 2482189, 2482214
E-mail : mining@meconlimited.co.in

We hereby undertake that all modifications / updating as made in the Modified Mining plan by the said recognized person be deemed to have been made with our knowledge and consent and shall be acceptable on us and binding in all respects.

02. It is certified that to implement CCOM's circular no. 2/2010 (addendum) regarding system of construction & maintenance of boundary pillars within a period of six (6) months of receipt of the authenticated Geo-referenced ML Plan.
03. It is certified that the Progressive Mine Closure Plan of Kodingamali Buaxite lease of The Odisha Mining Corporation Ltd, Odisha, Bhubaneswar over an area of 428.075 hectares complies with all statutory Rules, Regulations, Orders made by the Central or State Government, Statutory Organization, Court etc. which have been taken into consideration and wherever any specific permission is required, the Lessee will approach the concerned authorities.
The information furnished in the Progressive Mine Closure Plan is true and correct to the best of our knowledge and records.
04. The provisions of Mines Act, Rules and Regulations made there under have been observed in the Modified Mining Plan of Kodingamali Buaxite lease over an area of 428.075 hectares and where specific permissions are required, the Lessee will approach the DGMS. Further, standards prescribed by DGMS in respect of miners' health will be strictly implemented.
05. We do hereby undertake to complete exploration in respect of entire M.L area over 428.075 ha of Kodingamali Buaxite lease in time bound manner in accordance with Ministry of Mines letter No.10/75/2008-MV dated 23.12.2010.

Place : Bhubaneswar
Date :


Girish SN, IAS,
Managing Director & Owner of the Mine


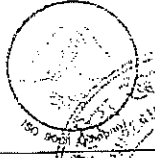


CERTIFICATE FROM RQP

The provisions of the Mineral Conservation & Development Rules 1988 have been observed in the preparation of the modifications proposed to the approved mining plan of Kodingamali lease over an area of 428.075 Ha. of M/s Odisha Mining Corporation Ltd. located in Distt. – Koraput & Rayagada of Odisha state and whenever specific permissions are required, the applicant will approach the concerned authorities of Indian Bureau of Mines.

The information furnished in the modification proposed to the approved mining plan is true & correct to the best of our knowledge.

Place: Ranchi Name of the recognized person: PK Bhattacharjee (key person), MECON Limited
Date: 21/3/14 Reg. No. RQP/RNC/113/2004/B

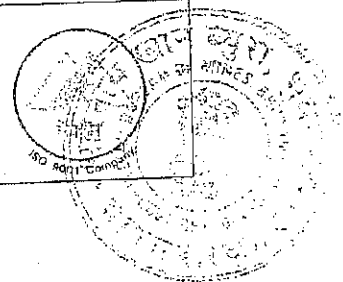
	MODIFIED MINING PLAN	
	KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.)	
	LESSEE: ODISHA MINING CORPORATION LIMITED	
	RQP : MECON LIMITED	

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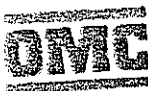


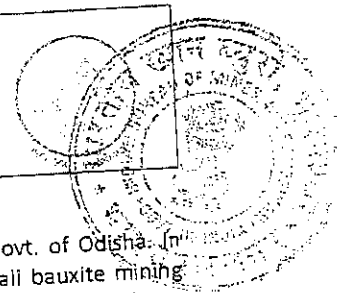
MODIFIED MINING PLAN
KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.)
LESSEE: ODISHA MINING CORPORATION LIMITED
RQP : MECON LIMITED



LIST OF DRAWINGS

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Surface plan	MEC/11/16/ Q78P/5
Year wise pit development plans	MEC/11/16/ Q78P/6 (5 Nos.)
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Progressive mine closure plan	MEC/11/16/ Q78P/12

	MODIFIED MINING PLAN
	KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.)
	APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED



INTRODUCTION

Odisha Mining Corporation Limited (OMC) is a wholly state-owned Corporation of Govt. of Odisha. In principle approval from the Central Govt. has been accorded for grant of Kodingamali bauxite mining lease in respect of 715.075 Ha. of land (Copy enclosed as Annex.7). Kodingamali bauxite mining lease was granted by Govt. of Odisha to OMC for an area of 715.075 Ha. subject to acceptance of certain terms & conditions (Copy enclosed as Annex.8). Govt. of Odisha vide letter dated 22.5.06 provided OMC a precise area map of Kodingamali ML for an area of 447.25 Ha. (Copy enclosed as Annex.9). Mining plan for the same was accordingly prepared for an area of 447.25 ha. and subsequently approved by IBM (Copy enclosed as Annex.13). Permission has been accorded from IBM to prepare the plans in the scale of 1: 4000 (Copy enclosed as Annex.12). Environment clearance has also been accorded to OMC for the said area from MoEF (Copy enclosed as Annex.14). OMC subsequently requested the state govt. for reduction in the ML from 447.25 ha. to 428.31 ha. and the same was accepted by Govt. of Odisha (Copy of the letter from Govt. of Odisha in this regard is enclosed as Annex.10). OMC further submitted an application to the state govt. for grant of precise area plan of 428.31 ha. (Copy enclosed as Annex.11). The precise area plan has been granted for an area of 428.075 ha (Copy enclosed As Annex. 11A.).

The status of all statutory clearances have been summarised in the table below:-


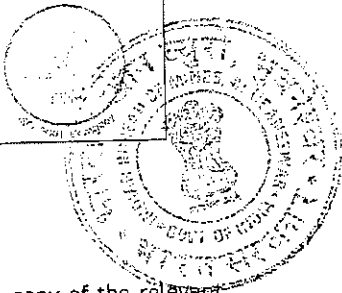
S.No.	Statutory clearance	Present status
1	Environment clearance	Accorded by MoEF (copy enclosed as Annex.-14)
2	Forest clearance	Proposal for diversion of forest land submitted on 3.10.2015. Permission under Forest Rights Act available. Site inspection report and recommendation of DFO, Rayagada division completed (copy enclosed as Annex.-25) Forest clearance not received till date.
3	Surface rights	The entire ML area falls under forest land and proposal for forest clearance has already been submitted to the competent statutory authority which is under perusal.

The present submission is therefore a modified mining plan for the change in the ML area from 447.25 ha. to 428.075 ha. submitted under rule 22(6) of MCR 1960. All the annexure have been enclosed as a separate volume (Vol.-III) properly numbered and reference of the same is given in this document.

अनुमोदित
APPROVED

REGIONAL CONTROLLER OF MINES
भारतीय खान ब्यूरो
INDIAN BUREAU OF MINES
भुवनेश्वर / BHUBANESHWAR

(PK Shattacharjee, key person, RQP, MECON Limited)

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 423.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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1.0 GENERAL

Shri Girish S N,
Managing Director & Nominated Owner
Odisha Mining Corporation Limited, Bhubaneswar

a) Name of applicant/ lessee/ Rule 45 registration No.
 A list of board of directors is enclosed as Annex. – 1. A copy of the relevant extract from the minutes of 409th meeting approved by Board regarding appointment of Nominated Owner of the mine is enclosed as Annex. – 2. A copy of photo id. & address proof of the nominated owner of the mine is enclosed as Annex. – 3.

Registration No. of OMC Ltd. under Rule 45 IBM/4269/2011

Address OMC House, Post Box No. 34
 Bhubaneswar - 751001

District Khurda

State Odisha

Pin Code 751001

Phone 0674-2393431, 2395689, 2393389

Fax 0674-2391629, 2396889, 2394772

Gram -

Telex -

e-mail info@odishamining.com

b) Status of the applicant

Private individual No

Cooperative Association No

Private Company No

Public Company No

Public Sector Undertaking Yes

Joint Sector Undertaking No

Other (pls. specify) Not Applicable

Certificate of incorporation is enclosed as Annex. – 5.

c) Mineral(s) which is / are include in the prospecting license (For fresh grant) Not applicable

d) Mineral(s) which is / are include in the lease deed Bauxite ore (ML deed yet to be executed)

e) Mineral(s) which the applicant /lessee intends to mine Bauxite ore

f) Name of Recognized Person under rule 22C of MCR, 1960 or a Person employed under clause (c) of sub rule (1) of rule 42 of MCDR, 1988 (Applicable for Scheme of Mining only) preparing Mining Plan:

Name of the RQP MECON Limited

preparing the mining plan Copy of the RQP certificate is enclosed as Annex. – 4.

Address P.O – Doranda, Ranchi – 834002, Jharkhand

Phone 0651 - 2481093, 2483645

Fax 0651 - 2482189, 2482214


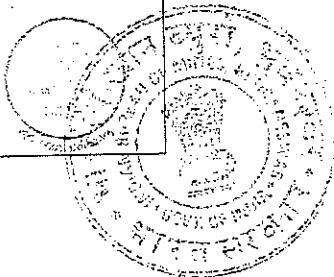
e-mail mining@meconlimited.co.in

Telex -

Registration No. RQP/RNC/113/2004/B

Date of grant / renewal 17.12.2004

Valid upto 16.12.2017

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED	

2.0 LOCATION AND ACCESSIBILITY


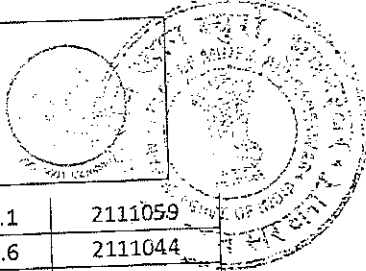
a) Lease Details (Existing Mine)

Name of Mine Kodingamali Bauxite Mining Lease (428.075 ha.)

Kodingamali Bauxite Mining Lease of Odisha Mining Corporation Ltd., is bounded between latitudes 19° 01' 46.35"N - 19° 05' 13.85"N and longitudes 83° 03' 22.91"E - 83° 05' 11.89" E and is covered by Survey of India topo sheet no. 65 M/4. UTM co-ordinates of the boundary pillars are given below:-

Latitude
/Longitude
of any
boundary
point.

Boundary Pillar No.	UTM Co-Ordinates		Boundary Pillar No.	UTM Co-Ordinates	
	Easting	Northing		Northing	Easting
A	718405.7	2110039	Z-8	717578.5	2106202
B	718117.4	2110209	Z-9	717438.4	2106339
C	718107.1	2109981	Z-10	717618.7	2106630
D	718347.4	2109925	Z10-A	717986	2106458
E	718191.1	2109555	Z-11	718311.4	2106305
E-1	718227.9	2109190	Z-12	718217.8	2106504
F	718261.3	2108857	Z-13	718203.5	2106717
G	718156.4	2108852	Z-14	718053.7	2106844
G-1	718087.9	2109094	8-P	718038.2	2106887
H	718012.2	2109362	9-P	717890.4	2106884
I	717973.6	2109784	10-P	717892	2107572
J	717648.1	2109716	Z-17	717999.7	2107568
J-1	717561.6	2109473	Z-18	718303.5	2107834
K	717408	2109041	Z-19	718189.6	2108237
L	717730.1	2109072	Z-20	718365.1	2108444
M	718039.6	2108886	Z20-A	718552.7	2108571
N	717994.7	2108454	Z20-B	718750.1	2108699
O	717860.1	2108366	Z-21	718898.8	2108796
O-1	717765.8	2107987	Z-22	718788.7	2108930
1-P	717708.2	2107766	Z-23	718894	2109074
2-P	717721	2107706	Z-24	718755.9	2109183
3-P	717739.1	2107629	Z-25	718735.6	2109352
4-P	717738.3	2107518	Z-26	718927.9	2109520
5-P	717730.7	2107467	Z-27	718854.4	2109658
6-P	717557.4	2107111	Z-28	718981.9	2109861
P	717536.8	2107067	Z28-A	718921.7	2110163
Q	717089.9	2107109	Z28-B	718865.1	2110451
Q-1	716909.8	2106979	Z-29	718816.2	2110705
Q-2	716695	2106824	Z29-A	718914.4	2110908
Q-3	716573.2	2106736	Z-30	719015	2111114
Q-4	716416	2106622	Z30-A	719168.7	2111091

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED		

7-P	716567.2	2106361	Z30-B	719375.1	2111059
T	716735.1	2106414	Z-31	719478.6	2111044
U	716860.1	2106260	Z31-A	719494.2	2111222
X	716973.3	2106091	Z31-B	719511.7	2111423
Y	716971.7	2106489	Z31-C	719529.6	2111627
Z	717130.7	2106968	Z-32	719542.1	2111768
Z-1	717335.5	2106515	Z32-A	719333.1	2111770
Z1-A	717176.8	2106030	Z32-B	719091.7	2111773
Z-2	716981.9	2105435	Z-33	718936.6	2111774
Z-3	717023	2105370	Z33-A	718792.7	2111599
Z3-A	717319.2	2105382	Z33-B	718645.9	2111422
Z3-B	717486.6	2105387	Z33-C	718507.6	2111253
Z-4	717661.1	2105393	Z-34	718352.8	2111065
Z-5	717651.3	2105624	Z34-A	718364.5	2110809
Z-6	717481.7	2105668	Z34-B	718377	2110521
Z6-A	717468.2	2105926	Z34-C	718392.5	2110242
Z-7	717456.7	2106169			

Date of
grant of
lease
Period/
Expiry
Date
Name of
lease
holder
Address
Tel.
Fax
e-mail
Mobile

The deed has not been executed yet.

The deed has not been executed yet. Therefore, the expiry date can't be specified.

Odisha Mining Corporation Limited

OMC House, Post Box No. 34

Bhubaneswar – 751001, Odisha

0674-2393431, 2395689, 2393389



0674-2391629, 2396889, 2394772

immcon_mine@yahoo.co.in, info@odishamining.com

+91 94372 60607

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

Forest (Specify)	Area, (ha)	Non Forest (Specify)	Area, (ha)
Kodingamali RF	406.385	Waste Land	NIL
		Grazing Land	
Kodinga PRF	21.69	Agriculture Land	
		Others (Specify)	
Total	428.075	Total	NIL

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED		

Total lease area / applied area	428.075 ha
District & State	District: Koraput & Rayagada, State: Odisha
Tahsil	Rayagada
Village	Kodingamali
Whether the area falls under Coastal Regulation Zone (CRZ)? If yes, details thereof	No

Precise area plan of Kodingamali Bauxite Mine Lease is shown in drawing no. MEC/11/16/Q78P/02.

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


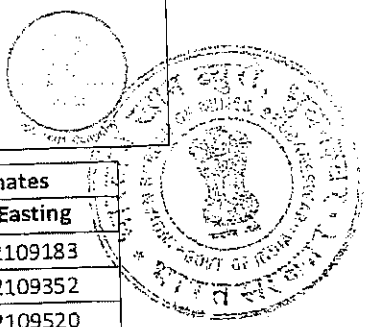
The Kodingamali Bauxite Mine Lease is accessible through all weather motorable road via Lakshmpur Road Railway Station covering 57 km from Rayagada Railway Station of East Coast Railway. The extreme northern portion of the lease hold area, existing at top of the plateau, is 18 km away from Lakshmpur on Lakshmpur – Kodinga route falling on the right side of Lakshmpur – Koraput main road. The National Highway - 326 is also at around 8 km away from the proposed mining lease.

Toposheet No. with latitude & longitude of all corner boundary point/pillar

Kodingamali Bauxite Mining Lease of Odisha Mining Corporation Ltd., is bounded between latitudes 19° 01' 46.35"N - 19° 05' 13.85"N and longitudes 83° 03' 22.91"E - 83° 05' 11.89" E and is covered by Survey of India toposheet no. 65M/4. UTM co-ordinates of the boundary pillars are given below:-


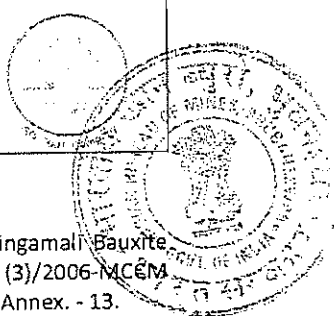
Boundary Pillar No.	UTM Co-Ordinates		Boundary Pillar No.	UTM Co-Ordinates	
	Easting	Northing		Northing	Easting
A	718405.7	2110039	Z-8	717578.5	2106202
B	718117.4	2110209	Z-9	717438.4	2106339
C	718107.1	2109981	Z-10	717618.7	2106630
D	718347.4	2109925	Z10-A	717986	2106458
E	718191.1	2109555	Z-11	718311.4	2106305
E-1	718227.9	2109190	Z-12	718217.8	2106504
F	718261.3	2108857	Z-13	718203.5	2106717
G	718156.4	2108852	Z-14	718053.7	2106844
G-1	718087.9	2109094	8-P	718038.2	2106887
H	718012.2	2109362	9-P	717890.4	2106884
I	717973.6	2109784	10-P	717892	2107572
J	717648.1	2109716	Z-17	717999.7	2107568
J-1	717561.6	2109473	Z-18	718303.5	2107834
K	717408	2109041	Z-19	718189.6	2108237
L	717730.1	2109072	Z-20	718365.1	2108444
M	718039.6	2108886	Z20-A	718552.7	2108571
N	717994.7	2108454	Z20-B	718750.1	2108699
O	717860.1	2108366	Z-21	718898.8	2108796
O-1	717765.8	2107987	Z-22	718788.7	2108930
1-P	717708.2	2107766	Z-23	718894	2109074

(PK Bhattacharjee, key person, RQP, MECON Limited)

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED		

Boundary Pillar No.	UTM Co-Ordinates		Boundary Pillar No.	UTM Co-Ordinates	
	Easting	Northing		Northing	Easting
2-P	717721	2107706	Z-24	718755.9	2109183
3-P	717739.1	2107629	Z-25	718735.6	2109352
4-P	717738.3	2107518	Z-26	718927.9	2109520
5-P	717730.7	2107467	Z-27	718854.4	2109658
6-P	717557.4	2107111	Z-28	718981.9	2109861
P	717536.8	2107067	Z28-A	718921.7	2110163
Q	717089.9	2107109	Z28-B	718865.1	2110451
Q-1	716909.8	2106979	Z-29	718816.2	2110705
Q-2	716695	2106824	Z29-A	718914.4	2110908
Q-3	716573.2	2106736	Z-30	719015	2111114
Q-4	716416	2106622	Z30-A	719168.7	2111091
7-P	716567.2	2106361	Z30-B	719375.1	2111059
T	716735.1	2106414	Z-31	719478.6	2111044
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Z-1	717335.5	2106515	Z32-A	719333.1	2111770
Z1-A	717176.8	2106030	Z32-B	719091.7	2111773
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Z-4	717661.1	2105393	Z-34	718352.8	2111065
Z-5	717651.3	2105624	Z34-A	718364.5	2110809
Z-6	717481.7	2105668	Z34-B	718377	2110521
Z6-A	717468.2	2105926	Z34-C	718392.5	2110242
Z-7	717456.7	2106169			

- c) Attach a general location map showing area and access routes. It is preferred that the area be marked on a Survey of India topographical map or a cadastral map or forest map as the case may be. However, if none of these are available, the area may be shown on an administrative map: The same has been shown in the Key Plan as Drawing No. MEC/11/16/Q78P/1.

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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3.0 DETAILS OF APPROVED MINING PLAN / SCHEME OF MINING (if any)

3.1 Date and Reference of Earlier Approved MP/ SOM:

The last mining plan along with the progressive mine closure plan in respect of Kodingamali Bauxite Mine Lease (447.25 Ha.) was approved by Indian Bureau of Mines vide letter no. 314 (3)/2006-MC&M (CZ)/ MP-4 dated 15.09.2006 for an area of 447.25 ha. A copy of the same is enclosed as Annex. - 13.

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

Not applicable

3.3 Give review of earlier approved proposal (if any) in respect of exploration, excavation, reclamation etc.

Achievements against the proposal envisaged in the last approved mining plan and the justification thereof for deviations, if any, is mentioned below:

i) Exploration:

Year	Nos. of boreholes		Reason for deviation
	Planned	Actual	
1 st year	49 Nos.	NIL	Due to non execution of ML deed.
2 nd year	56 Nos.	NIL	
3 rd year	108 Nos.	NIL	
4 th year	85 Nos.	NIL	
5 th year	44 Nos.	NIL	
Total	342 Nos.	NIL	

ii) Mine Development and Exploitation

The achievement position as against the target in respect of production of ore & sub grade with removal of waste is given in the table below.

Year	Bauxite, t		Sub grade, cu.m.		Waste, cu.m.	
	Planned	Actual	Planned	Actual	Planned	Actual
1 st year	30,41,400	NIL	1,49,842	NIL	1,65,662	NIL
2 nd year	30,92,400	NIL	60,895	NIL	2,42,639	NIL
3 rd year	30,81,599	NIL	1,04,269	NIL	1,94,043	NIL
4 th year	30,29,799	NIL	83,836	NIL	2,01,785	NIL
5 th year	30,23,600	NIL	1,17,142	NIL	75,936	NIL
Total	152,68,798	NIL	5,15,984	NIL	8,80,065	NIL


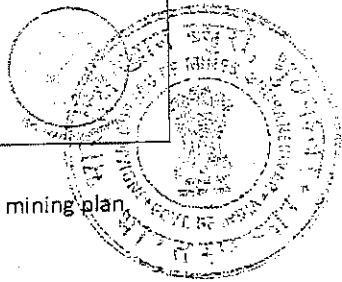
The reason for zero production of ore and generation of sub grade and waste is non execution of the ML deed.

iii) Afforestation



The achievement position as against the target in respect of afforestation is given in the table below.

Year	Afforestation, Nos	
	Planned	Actual, Nos.
1 st year	1,350 Nos.	NIL
2 nd year	1,500 Nos.	NIL
3 rd year	1,500 Nos.	NIL
4 th year	1,500 Nos.	NIL
5 th year	1,500 Nos.	NIL
Total	7,350 Nos.	NIL

The reason for zero afforestation is non execution of the ML deed.

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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- iv) **Land Reclamation and Rehabilitation:**
 No reclamation & rehabilitation has been proposed for the first 5 years in the approved mining plan.
 The reason the same is non execution of the ML deed.
- v) **Waste dump management:**
 The wastes generated were planned to be stacked as refuse dumps. However, as the mine has not yet started due to non-execution of the ML deed, there has been no generation of wastes.
- vi) **Control of dust, Noise and ground vibration:**
 To control the dust, it was proposed for water sprinkling on haulage roads, dust collectors on drilling equipments, trees along the haulage roads etc. Monitoring of the ambient air quality, noise quality, water quality etc have been carried out during preparation of the EIA report and a copy of the same is enclosed as Annex. 15. The baseline data has been collected by M/s Vimta labs Ltd. The period of data collection has been between 1.12.2004 to 30.11.2005
- 3.4 **Give status of compliance of violations pointed out by IBM**
 No violation has been pointed out under MCDR during the last plan period.
- 3.5 **Indicate and give details of any suspension /closure/ prohibitory order issued by any Government agency under any rule or Court of law:**
 Not applicable
- 3.6 **In case the MP/SOM is submitted under rules 9 and 10 of the MCDR'88 or under rule 22(6) of the MCR'1960 for approval of modification, specify reason and justification for modification under these rules:**
 The present submission is a modified mining plan along with the progressive mine closure plan for its approval from Indian Bureau of Mines due to change in ML area from 447.25 ha. to 428.075 ha. under rule 22(6) of MCR 1960.

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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PART – A

1.0 GEOLOGY AND EXPLORATION

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

i. Physiography & Drainage

The Kodingamali plateau is a part of Eastern Ghat hill ranges in Odisha. The Bauxite deposit form a blanket occupying the surface of the tabular landscape, linear in shape, trending almost in NNE – SSW direction for a length of about 7 km with an average width of 780 m. The area of capping is about 5.33 sq. km. The deposit has a maximum height of 1276 m above mean sea level in northern part and 1262 m above mean sea level in southern part. The average height of Kodingamali plateau to the surrounding valley is about 300 m. The capping has gentle slopes to the west, north and south but comparatively steep slope in its eastern part. The entire eastern margin of capping as well as part of the western margin is marked by development of prominent escarpments. **The plateau top is a continuous stretch of flat land intercepted by small saucer shaped depression which is filled with soil & humus varying in thickness of few inches to about 1.5 ft.** Kodingamali plateau top has no perennial streams flowing down the slope. But a number of springs originate from the foot hills of the plateau, the most prominent ones are towards the eastern margin of the area. Pathgarha river, which flows in a north – easterly direction is about 3.5 km from the northern end of the area. It controls the regional drainage of the terrain.

ii. Vegetation

The plateau top is generally devoid of any substantial vegetation giving the hill a bald look. The plateau top is marked by thorny bushes and dwarf variety of date palm plant. The dwarf date palm is being considered lately as a botanical indicator for the aluminous deposits. At least a couple of varieties of grass thrive on the plateau surfaces by taking advantage of the thin layer of humus overlying the hard lateritic capping. Occasional sight of Murga and Kosala plants are also visible on the plateau top. Moreover, Khondalitic exposures support growth of trees and shrubs in the slopes and valleys only, not on the plateau top.



iii. Climate & Rainfall

The area has a tropical climate with monsoon rains from June to September and occasional winter rains. The area experiences cold weather between November to January when the temperature drops to less than 10° C. The temperature rises steadily from January onwards reaching 32°C - 40°C in summer i.e., the month of May. It experiences occasional gusty winds to heavy thunderstorms during summer (April – June). Monsoon breaks out in early to mid June and continues upto September. The average annual rainfall of Koraput district is about 1648 mm; under the influence of southwest monsoon. On an average, there are about 100 rainy days. The humidity is maximum (90%) in the months of July – August and minimum in February (35%). The wind velocity varies between 40 kmph and 80 kmph although occasional higher values have been reported. Lightning incidences are rarely reported in the area.

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

Regional Geology

The area forms a segment of the east-central part of the Eastern – Ghat hill ranges. The dominant rock type in the area is Khondalite and Charnockite suites and their variants. Khondalites (Garnet-Sillimanite-Quartz-Feldspar Gneiss) are high grade metasediments of argillaceous, arenaceous and calcareous nature. Charnockites (Hypersthene – diopside Granulites) and its equivalents porphyritic granite gneisses etc are of Pre-Cambrian age. In general, Khondalite forms high hills and peaks where as Charnockite is invariably confined to the valleys and slopes of hills. Both the group of rocks occurs as concordant bands. It is a common feature to observe islands of Khondalite within Charnockite rocks. Lateritisation of Khondalites and Charnockites and their variants have given rise to the bauxite deposits of the terrain.

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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Regional Stratigraphy

The Stratigraphic sequence in the region is as follows:

Recent/Tertiary	Alluvium and soil (valley areas) Feruginous and aluminous laterites (Hill top)
	-----Unconformity-----
Precambrian	Granetiferous porphyritic granodiorite, biotite – granite Gneisses etc. with later leuco – granite, garnetiferous Quartzite, graphite sillimanite, quartz schist and gneisses. Pyroxene granulites etc.

Both Khondalite and Charnockite and marked by lit – par – lit injection of quartz-feldspathic material, which has resulted in the formation of migmatite and augen gneiss. The contact between Charnockite and Khondalite, in general is marked by a garnetiferous quartzo – feldspathic granulite (Leptynite).

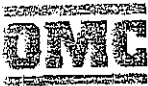

Structure

Khondalite suit of rocks in the region represents an overturned to reclined fold superimposed by later phases of folding. The regional trend of foliation varies between N – S & N60°E – S60°W. Alternating concordant bands represent tight isoclinal folds with gentle to moderate NE – SW trending fold axis. Khondalite occupy high and linear hills with sharp crests while the charnockites occur in low lying plains as well as dome shaped hillocks. Evidence of cross folding is present in the form of mesoscopic folds. The axes of the mesoscopic folds plunge 15° to 20° due southeast. Mineral and groove lineations plunge due east, south and southeast. The strike and dip joints are most prevalent. Large scale joints form some of the lineaments in the area. Several synformal structures could be made out by the convergence of dips. Some of the hills are synformal and the intervening low-lying areas are antiformal in nature.

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

Local Geology

The area around Kodingamali exposes rocks representing Eastern Ghat Group. The rock types encountered in these deposits are mostly Khondalite, Bauxite, Laterite, Clay and Soil. Khondalites occur as lenticular bodies on the surface as capping and having a trend in NNE-SSW to N – S directions with moderate to steep easterly dip (25° – 80°). They are at places tightly folded into steep northerly plunging isoclinal folds. Besides Khondalite there are two types of other varieties of Khondalite i.e., Partially Lateritised Khondalite (PLK) and Weathered/Kaolinised Khondalite (KK). Presence of PLK or KK indicates absence of Bauxite mineralization below it. Central portion of the Lease area has five outcrops of PLK/KK and similarly SW of Lease has two small outcrops. Laterite and bauxite occur as blanket in the northern, central and southern parts of the areas, east of Khondalite ridge. North of the Lease area has a higher elevation than the South, Bauxite ore thickness is more at North and metallurgical grade of Bauxite is also good. In the southern part, two / three broadly north-south trending Khondalite exposures intervene between the laterite / bauxite layer. East of the central Khondalite ridge, in the southern part of the deposit, laterite and bauxite occupy as triangular area. In the western area of the central part bauxite occurs between the central khondalite ridge and the khondalite is exposed at the plateau margin. The Bauxite deposit form a blanket occupying the surface of the tabular landscape, linear in shape, trending almost in NNE – SSW direction for a length of about 7 km with an average width of 780 m. The area of capping is about 5.33 sq. km. The deposit has a maximum height of 1276 m above mean sea level in northern part and 1262 m above mean sea level in southern part. The average height of Kodingamali plateau to the surrounding valley is about 300 m.

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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Lithology

The rock types encountered in these deposits are mostly Khondalite, Bauxite, Laterite, Clay and soil. Various litho-units and their description are outlined as below:

Litho unit	Description
Soil	Grey, Steel grey, buff yellow and brownish in colour, clayey with bauxite.
Laterite	Brown, dark brown, brick red to pink in colour, massive, cavernous & pisolitic at places grades into siliceous bauxite towards bottom.
Bauxite	Pale pink, pink, light brown to brick red in colour, semi massive and cavernous gibbsite as major mineral.
Clay (lithomarge)	White, dirty white, creamy buff, pink purple, dirty brown in colour with highly altered khondalite intercalations.
Altered Khondalite	Grey, green, pale brown and pinkish in colour.

Bauxite capping is linear in nature with limited with and relatively longer strike length. Bards and lenses of Khondalite and mixed zone proximately appear with the capping and give rise to topographic hills. The Bauxite is nodular at a few places. Khodigamali bauxite deposit contains minerals like gibbsite (67.34%), Bohemite (1.37%), Goethite (7.73%), Haematite (13.07%), Lepidochrosite (1.88%) and Kaolinite (3.35%). Laterite is usually dark brown, brown to brick red in colour where as bauxite is pale pink, dirty brown to brick red in colour & mostly semi-massive and carenous. In vesicular type, crystalline gibbsite occurs as coating in the cavities.

Bauxite Mineralization



The bauxite is of metal grade, characterized by low silica and titania, moderate alumina and somewhat high iron oxide contents. The most predominant mineral of the bauxite is gibbsite, which accounts for about 90% of the total alumina of the ore. The incidence of Boehmite is negligible. The bauxite zone is interspersed with Impersistent minor and thin patches of non-ore, which are essentially lateritic in nature.

Ore Occurrences and Characteristics

Kodingamali bauxite deposit is linear in shape, trending almost in NNE-SSW direction with moderate to seep easterly dip (25° - 80°) for a stretch of about 7 km with an average width of 780 m. The area of capping is about 5.33 sq. km. The plateau attains its maximum height of 1276 m in the northern part while 1162 m in the southern part. The capping has a gentle slope towards east. The northern and southern parts of the deposit are connected by a narrow flat stretch of ground. The average height of the Kodingamali deposit from the surrounding valleys is about 300 m. The entire eastern margin of the capping as well as part of the western margin is marked by development of prominent escarpments. As observed, the surface of the plateau is largely covered by laterite soil. Few impersistent narrow exposures of pisolitic laterite (essentially ferruginous) dissecting the capping at places and a few khondalite exposures are restricted to high topographical zone. Based on the sub-surface data, the profile of the deposit can be represented in the following manner:

<u>Litho Unit</u>	<u>Range in Thickness</u>
Soil	0.1 to 1.00m (Top)
Laterite	0.5 to 13.95m
Bauxite	2.24 to 44.0m
Clay (lithomarge)	1.35m to 36.7m
Altered Khondalite	Bottom not observed

Bauxite is considered to have been derived by the in-situ chemical weathering of khondalite. These are observed to occur as gentle dipping of near horizontal blanket capping over partially lateralized or weathered khondalite.

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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d) Name, address, e-mail & phone no. of prospecting /exploration agency :

M/s Mineral Exploration Corporation Ltd.
 Dr. Babasaheb Ambedkar Bhawan
 Seminary Hills, Nagpur-440 006, Maharashtra
 Tel:0712-2510310, 2511833
 E-mail: headbd@mecl.gov.in



e) Details of prospecting/exploration already carried out :

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

The exploratory works carried out by GSI during 1976-77 was on a regional scale. The exploratory works conducted by MECL comprises of 14 deep pits that have been put in during 1978-80.

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

MECL has explored the ML area (428.075 Ha.) with 330 Nos. of boreholes. The collar details of the boreholes drilled by MECL have been shown in Annex.-16. Chronology of the drilling carried out by different agencies at different periods of time is given below:-



- GSI has explored the area in the Yr. 1976-77 on a regional scale. Reference of the same is cited in the enclosed exploration report of MECL (Annex.-23) at page no. 269-270 (Vol.-III, Annexure). However, as the borehole logs were not available, the same could not be included in the present assessment.
- MECL has explored the area in the Yr. 1978-80. Copy of the exploration report is enclosed as Annex. 23.

iii) Details of samples analysis indicating type of sample (surface/ sub-surface from pits/ trenches/ borehole etc.) Complete chemical analysis for entire strata for all radicals may be undertaken for selected samples from a NABL accredited Laboratory or Government laboratory or equivalent. Entire mineralized area may be analyzed meter wise with 10% of check samples. (At least for 10% of total samples may be analyzed in accordance to BIS and reports from NABL accredited/other government laboratory).

The sample analysis of the boreholes drilled by MECL has been shown at page nos. 71-211 of Annex.-16. Six No. of samples have been analysed in the laboratory of Directorate of Mines, Govt. of Odisha in respect of the following radicals i.e. SiO₂ % (re-active), SiO₂ % (non-reactive), Total SiO₂%, Fe₂O₃%, TiO₂% & Al₂O₃%. A copy of the same is enclosed as Annex.20. The sample analysis of 14 deep pits made by MECL was also analysed by NABL accredited lab. And copy of the same is also enclosed as Annex.24.

iv) Expenditure incurred in various prospecting operations.

The details of the expenditure incurred are given below:-
 MECL (Approx. 93 Lakhs)

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- f) The surface plan of the lease area may be prepared on a scale of 1: 1000 or 1: 2000 with contour interval of maximum of 10 m depending upon the topography and size of the area duly marked by grid lines showing all features indicated under Rule 28(1)(a) of MCDR 1988.
The surface plan of the leasehold area prepared in the scale of 1: 4000 with contour interval of 5m is enclosed as Drawing No. MEC/11/16/Q78P/05. Permission has been taken from IBM to prepare the surface plan in an enhanced scale. Copy of the permission is enclosed as Annex.12.
- g) For preparation of geological plan, surface plan prepared on a scale of 1: 1000 or 1: 2000 scale specified under para 1.0 (f) of Part A of the format may be taken as the base plan. The details of exploration already carried out along with supporting data for existence of mineral, locations proposed exploration, various litho-units along with structural features, mineralized/ ore zone with grade variation if any may be marked on the geological plan along with other features indicated under Rule 28 (1)(b) of MCDR 1988.
The geological plan of the leasehold area showing all the above features prepared in the scale of 1: 4000 with contour interval of 5m is enclosed as Drawing No. MEC/11/16/Q78P/03. Permission has been taken from IBM to prepare the geological plan in an enhanced scale. Copy of the permission is enclosed as Annex.12.
- h) Geological sections may be prepared on natural scale of geological plan at suitable interval across the lease area from boundary to boundary.
The geological sections of the leasehold area showing all the above features in the scale of 1: 1000 are enclosed as Drawing No. MEC/11/16/Q78P/04.
- i) Broadly indicate the future programme of exploration with due justification (duly marking on Geological Plan year wise location in different colours) taking into consideration the future tentative excavation programme planned in next five years.
The proposed exploration plan for the 1st five years period of the modified mining plan is given below:-

Year	Bore holes No.		No. of Boreholes	Depth of Boreholes
	From	To		
1 st year	PBH-1	PBH-20	20	Avg. depth of 40m per hole
2 nd year	PBH-21	PBH-44	24	- do -
3 rd year	PBH-45	PBH-60	16	- do -
4 th year	PBH-61	PBH-79	19	- do -
5 th year	PBH-80	PBH-110	31	- do -
Total			110	Avg. depth of 40m per hole

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

On basis of the geological works carried out and stated at e(ii) above, the Kodingamali bauxite ML can be considered to be explored under G1/ G2 category of the geological axis as per UNFC. The parameters considered for estimation of mineral resources are stated below:-

1. The threshold value considered as per the IBM guidelines is (Min.) 30% Al₂O₃ & (Max.) 5% SiO₂ (reactive). The resources have been reported at 30% Al₂O₃ cut off.
2. However, the total no. of samples between 20% to 30% Al₂O₃ is only 2.1% of 10089 Nos. of samples analyzed. Again out of those 2.1% samples, approx. 54% of the samples are less than 1m in length and the remaining 46% are also between 1m to 2.2m in lengths. These small sample lengths lie in between high grade samples above 30% Al₂O₃ and therefore can't be practically segregated in a highly mechanized mine. It will get blended with the ore above threshold value during the process of mining. The quantity of such resources

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- between 20% to 30% Al₂O₃ has been reported separately.
- The lateral influence at the edges while preparing the transverse sections has not been taken beyond 25m. The distance between the boreholes to establish the resources under G1 category has been taken as 100 x 100m (max.) and beyond that to a maximum of 200 x 200m under G2 category.
 - No extrapolation of the section have been done along the depth, though most of the boreholes were terminated in ore itself.
 - 49 Nos. of transverse x-sections have been accordingly prepared for the ML area keeping into consideration the above norms.
 - The entire ore estimation has been done through ore body modeling & mine design software.
 - The insitu bulk density of the bauxite deposit has been considered to be 2t/m³.
 - The details of the resources estimated in tonnes based on the above parameters are given below:-

Block	Inferred Mineral Resources (333)	Indicated Mineral Resources (332)	Measured Mineral Resources (331)	Total
Kodingamali	NIL	19,067,000	58,444,750	77,511,750

- The details of the reserves estimated in tonnes after eliminating the ore lost in pit slopes, statutory barriers and assessment of the feasibility of the deposit (Copy enclosed as Annex.-17) are given below:-

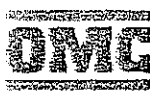
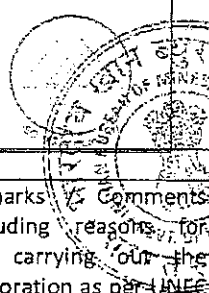
Block	Measured Resources (331)	Feasibility resources (211)		Proved Reserves (111)
		in pit slopes, stat. barrier etc	Ore between 20-30% Al ₂ O ₃ (blendable part)	
Kodingamali	58,444,750	11,316,500	207,500	46,920,750

Block	Indicated Resources (332)	Feasibility resources (222)		Probable Reserves (122)
		in pit slopes, stat. barrier etc	Ore between 20-30% Al ₂ O ₃ (blendable part)	
Kodingamali	19,067,000	4,756,625	95,875	14,214,500

- The summary of the exploration carried in prescribed format is given below:-

Total lease area: 428.075 Ha.

Item of information	Lease area explored as per UNFC norms (in Ha.) as on dtd. 1.3.2016					Remarks / Comments including reasons for not carrying out the exploration as per UNFC norms
	Total lease area = A +B +C+ D + E					
	G1 level	G2 level	G3 level	Explored and found non-mineralised with level of exploration (remarks)	Un-explored lease area	
	A	B	C	D	E	
Area as per level of exploration	150.3 Ha.	125.1 Ha.	NIL	NA	142.675 Ha.	-
No. of BH drilled	330 Nos.		NIL	NA	NIL	

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED					
	Lease area explored as per UNFC norms (in Ha.) as on dtd. 1.3.2016					
	Total lease area = A +B +C+ D + E					
Item of information	G1 level	G2 level	G3 level	Explored and found non-mineralised with level of exploration (remarks)	Un-explored lease area	Remarks/ Comments including reasons for not carrying out the exploration as per UNFC norms
	A	B	C	D	E	
No. of BH considered for resource estimation	330 Nos.		NIL	NA	NIL	
Meterage drilled	7917.12 m		NIL	NA	NIL	-
Grid interval	100 x 100m (max.). 50m on both side of the sections with 25m on the edges.	Beyond G1 area upto a further distance of 50m on each side of the sections.	NIL	NA	NIL	-
Scale of mapping	1: 2000	1: 2000	NIL	NA	NIL	-
Reserve estimated after above exploration as on dtd. 1.3.2016					61135250 t	
Remaining resource after above exploration as on dtd. 1.3.2016					16376500 t	
Total reserve/ resource after above exploration as on dtd. 1.3.2016					77511750 t	

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

The detailed calculation of the level wise & section wise estimate of the resources/ reserves for Kodingamali deposit is given in Annex.-18.

l) Estimation of Reserve and Quality

The reserves/ resources estimated as per the IBM thresholds are given below.

Block	Inferred Mineral Resources (333)	Indicated Mineral Resources (332)	Measured Mineral Resources (331)	Total
Kodingamali	NIL	19,067,000	58,444,750	77,511,750

The details of the reserves estimated in tonnes after eliminating the ore lost in pit slopes, statutory barriers and assessment of the feasibility of the deposit (Copy enclosed as Annex.-17) are given below:-

Block	Measured Resources (331)	Feasibility resources (211)		Proved Reserves (111)
		in pit slopes, stat. barrier etc	Ore between 20-30% Al ₂ O ₃ (blendable part)	
Kodingamali	58,444,750	11,316,500	207,500	46,920,750



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Block	Indicated Resources (332)	Feasibility resources (222)		Probable Reserves (122)
		in pit slopes, stat. barrier etc	Ore between 20-30% Al ₂ O ₃ (blendable part)	
Kodingamali	19,067,000	4,756,625	95,875	14,214,500

The reason for changes in reserves/ resources figure from the last approved document is also given below:-

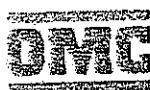

Sl.No.	Parameter comparison	of Last approved document	Present submitted document	Remarks
1	No. of holes considered for resource estimation	198 Nos. (Only of Hindalco)	330 Nos. (MECL) #	Copy of borehole logs are enclosed as Annex.-16. (+67% change from the last approved document)
2	No. of x-sections prepared	38 Nos.	49 Nos.	As per the UNFC norms.
3	UNFC category	Both G1 & G2	Both G1 & G2	Present assessment is for the ML area of 428.075 Ha.
4	Resources established	79.34 Million tones	77.51 Million	(- 2.3% change from the last approved document)

#The boreholes reported to be drilled and considered for resource estimation in the last approved document have not been considered in this document, as the applicant (OMC Ltd.) do not have an authenticated copy of the exploration report of the respective exploring agency, which was desired against the scrutiny observations of IBM.

Category wise updated reserves with grade (As on 1.3.2016) are given in the table below:-

Sl. No	Reserve Category (UNFC Classification)	Qty. in Tonnes	Grade (Al ₂ O ₃ %)
1	Proved Mineral Reserves (111)	46,920,750	44.81
2	Probable Mineral Reserves (122)	14,214,500	43.67
3	Feasibility Mineral Resource (211)	11,524,000	43.42
4	Pre-Feasibility Mineral Resource (222)	4,852,500	42.94
5	Remaining measured resource (331)	NIL	NA
6	Remaining Indicated Resource (332)	NIL	NA
7	Remaining Inferred Resource (333)	NIL	NA
8	Remaining Reconnaissance Resource (334)	NIL	NA

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

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED		

2.0 MINING

A. OPEN CAST MINING:

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

The Kodingamali Bauxite lease is still a virgin land. Therefore, there are no any existing mining operations in field. The mine working has not yet started due to non-execution of the ML deed.

The present submission is a modified mining plan along with the progressive mine closure plan for its approval from Indian Bureau of Mines due to the change in ML area from 447.25 ha. to 428.075 ha. The maximum production capacity envisaged for the mine is 3.0 million tonnes per annum. The above production is planned to be achieved by developing benches of 10 m height and maintaining working width of 25 m. Proposal is to adopt mechanical opencast method of mining on two shifts basis with deployment of major earth moving machineries as 150 mm dia blast hole drill, 4-4.5 cu.m. hydraulic shovels, 400 HP Bull dozer, mobile crusher of 400 – 1000 tph capacity, 770 HP ripper dozer & 35t dumpers. It is proposed that 50% of the production target will be achieved with ripping & the remaining 50% with deep hole drilling & blasting. The salient proposed mine design features are given below:-

Bench height	Upto 10 m.
Bench width	25 m
Individual bench slope	70°
Overall pit slope	Less than 20°

- b) Indicate year-wise tentative excavation in cu.m indicating development, ROM, pit wise as in table below.

i) Insitu tentative excavation:

Year	Pit No.	Total Tentative Excavation (M. cu. m)	Top Soil cu. m	OS/SB/ IB (M. cu. m)	ROM (M. cu. m)		ROM:Waste cu. m : cu. m
					Ore * (M. cu. m)	Mineral Reject (M. cu. m)	
1 st year	Kodingamali Bauxite ML	0.797	17,156	NIL	0.78	NIL	NIL
2 nd year		1.489	9,234	NIL	1.48	NIL	NIL
3 rd year		1.503	13,277	NIL	1.49	NIL	NIL
4 th year		1.515	15,041	NIL	1.50	NIL	NIL
5 th year		1.509	18,641	NIL	1.49	NIL	NIL
Total		6.813	73,349	NIL	6.74	NIL	NIL

* Tentative tonnage of the ore may be arrived by computing approximate bulk density and recovery factor as these data are variable and may be established on time series.



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

Not applicable, as dump re-handling has not been envisaged.

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

The year wise development plans for the period ending 1st to 5th years are shown in Drg. Nos. MEC/11/16/Q78P/06 respectively. The year wise development sections for the period ending 1st to 5th year are shown in Drg. Nos. MEC/11/16/Q78P/04. Composite mine development plan is also enclosed as Drg. No. MEC/11/16/Q78P/07.

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	<p align="center">MODIFIED MINING PLAN</p> <p align="center">KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.)</p> <p align="center">APPLICANT: ODISHA MINING CORPORATION LIMITED</p> <p align="center">RQP : MECON LIMITED</p>	
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- d) Describe briefly giving salient features of the proposed method of working indicating Category of mine. Kodingamali Bauxite Mine Lease is a Category-A mine (Fully Mechanized). The mine shall be worked in conventional opencast mechanized method. The bauxite deposit is located in the plateau area of Kodingamali hill and the Mining Block in hill top is having the average R.L. of 1276 m. The average production will be around 3.0 Mt of bauxite by developing benches of 10 m height and maintaining working width of 25 m. Proposal is to adopt mechanical opencast method of mining on two shifts basis with deployment of major earth moving machineries as 150 mm dia blast hole drill, 4-4.5 cu.m. hydraulic shovels, 400 HP Bull dozer, mobile crusher of 400 – 1000 tph capacity, 770 HP ripper dozer & 35t dumpers. It is proposed that 50% of the production target will be achieved with ripping & the remaining 50% with deep hole drilling & blasting. The salient proposed mine design features are given below:-

Bench height	Upto 10 m.
Bench width	25 m
Individual bench slope	70°
Overall pit slope	Less than 20°

The year-wise phasing of bauxite production till it reaches the peak capacity is given below:-

Parameters	1 st Year (t)	2 nd Year (t)	3 rd Year (t)	4 th Year (t)	5 th Year (t)
Bauxite Production	15,62,675	29,49,800	29,75,250	29,96,400	29,78,100

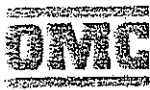

It may be noted that there will not be any waste production during the above period, except negligible top soil production which will be used for avenue plantation purpose.

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

The year wise plans for the period ending 1st to 5th years are shown in Drg. Nos. MEC/11/16/Q78P/06. The year wise sections for the period ending 1st to 5th year are shown in Drg. Nos. MEC/11/16/Q78P/04. The surface plan of the mine as on 1.3.2016 is shown as Drg. No. MEC/11/16/Q78P/05. No separate dump of waste/ sub grade material will be created as there will not be any generation of above mentioned materials. A summary of the pit configuration during the 1st five years of mining operation is given in the table below:-

Description	1 st year	2 nd year	3 rd year	4 th year	5 th year
Height of the benches (m)	10 m	10 m	10 m	10 m	10 m
Width of the benches (m)	25 m	25 m	25 m	25 m	25 m
Bank slope angle	70°	70°	70°	70°	70°
Avg. bench floor length (m)	1016 m	1239 m	1503 m	1725 m	1396 m
Overall direction of excavation	Starts from a virgin location and advances towards the East.	Movement towards the East & South	Movement towards the East & South	Movement towards the East & South	Movement towards the East & South.
Number of proposed benches under working	4 Nos.	2-3 Nos.	2-3 Nos.	2-3 Nos.	2-3 Nos.
Floor RL of the top-most bench (mRL)	1255 mRL	1255 mRL	1255 mRL	1255 mRL	1255 mRL
Floor RL of the bottom-most bench (mRL)	1225 mRL	1205 mRL	1195 mRL	1185 mRL	1175 mRL
Proposed Qty. of ROM to be produced (>30% Al ₂ O ₃)	15,62,675 t	29,49,800 t	29,75,250t	29,96,400t	29,78,100t

* Tentative tonnage arrived @ 17 m³ / Cum per insitu bulk density test carried out & reported in M&C exploration reports.

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Average stripping ratio	NIL	NIL	NIL	NIL	NIL
Average Grade of ROM ore (Al ₂ O ₃ %)	45.59%	45.29%	45.98%	44.92%	44.34%

The detailed calculation for the proposed production plan is given in Annex. 19.

- f) **Conceptual Mine planning upto the end of lease period taking into consideration the present available reserves and resources describing the excavation, recovery of ROM, Disposal of waste, backfilling of voids, reclamation and rehabilitation showing on a plan with few relevant sections.** Kodingamali lease comes under Category – A (fully mechanized category) as per the IBM guidelines. Therefore, conceptual plan of Kodingamali lease is prepared on the basis of the life of deposit considering the proved existence of the mineral. Conceptual mining plan has been prepared following the guidelines of IBM, keeping in view the present knowledge of the deposit, topography of the area, surface drainage pattern, mineable reserves available, mining technology etc. On the basis of available exploration data, the resource model of deposit has been created in a mine planning software viz. SURPAC. The ultimate pit has been designed using the following bench configurations:-

Quarry	Bench Height, m	Bench Width, m	Bank Slope Angle	Ultimate Pit Slope
Kodingamali Bauxite ML	10	25	70°	Less than 20°

A safety barrier of 7.5 m width has been maintained all along inside the lease.

Life of Mine: The quantity of mineable reserves as on 1.11.2015 stands at 64.6 million tonnes. Therefore, the life of mine at the proposed production rate of 3 Mt per annum will be around 22 years.



Disposal of Sub grade mineral: No separate dump of sub grade material will be created as there will not be any generation of sub grade materials. However, if sub grade mineral is generated, then the same will be blended with the better ones to produce the saleable grade.

Waste Disposal: No separate dump of waste material/ OB will be created as there will not be any generation of OB.

Exploration: In order to ascertain the availability of ores in within the mining lease area, 110 Nos. of boreholes through core drilling have been proposed to be carried out. The details of the proposed exploration program are given below:-

Year	Bore holes No.		No. of Boreholes	Depth of Boreholes
	From	To		
1 st year	PBH-1	PBH-20	20	Avg. depth of 40m per hole
2 nd year	PBH-21	PBH-44	24	- do -
3 rd year	PBH-45	PBH-60	16	- do -
4 th year	PBH-61	PBH-79	19	- do -
5 th year	PBH-80	PBH-110	31	- do -
Total			110	Avg. depth of 40m per hole

Environmental Monitoring: Noise, air, water and other environmental parameters will be monitored periodically to have a close check on the environmental pollution parameters. Spraying of water on haul roads, use of wet drilling techniques & prevention of vibration by utilization of minimum quantity of explosive per delay will be carried out. The pit position at the end of conceptual period is depicted as Drg. No. MEC/11/16/Q78P/08 and conceptual pit section are shown in the geological section as Org. No. MEC/11/16/Q78P/04.



	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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Land use: The stage wise land usages are given below:-

Heads	Area (ha.)		
	As on 1.3.2016	At the end of 5 th year	At conceptual period
Mining	0.000	48.196	364.164
Roads	0.000	2.691	0.000
Infrastructure (magazine only/ min. sep. plant/ ore storage/ parking/ offices etc.)	0.000	10.350	45.813
Safety zone, 7.5m lease boundary	0.000	18.098	18.098
Total	NIL	79.335	428.075

Post mining land use: The plateau top is a continuous stretch of flat land intercepted by small saucer shaped depression which is filled with soil & humus varying in thickness of few inches to about 1.5 ft. The mine has been designed in such a fashion that its benches reach its ultimate pit limit in sequential manner w.e.f 2nd year onwards so that the berm width can be utilised for afforestation. Pits of 1m x 1m x 1.5 m will be dug out and filled with the top soil alongwith some manure. Local species will then be planted over these pits which will be prepared in a grid of 3m x 3m over the stable mine berms. Therefore, post mining the entire area brought under open-pit operations/ infrastructure/ roads etc will be afforested. The post mining landuse is given in the table below and also shown in the conceptual plan & section:-

S.No	Land usage	Area (Ha.)
1	Afforested mined out voids alongwith infrastructure area with plantation of 451000 saplings @ 1100 Nos. / ha.	409.977
2	Safety zone, 7.5m lease boundary	18.098
3	Total	428.075

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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B. UNDERGROUND MINING

i. to viii: Not applicable

ix. EXTENT OF MECHANISATION

It has been planned to operate the Kodingamali Bauxite ML with the proposed fleet of mining machineries as given below:

Parameters	HEMM Fleet in Nos.	Remarks
Hydraulic Excavator, 4-4.5 cu.m	2	
Front end loader, 4-5 cu.m	1	50% of the production target to be achieved with ripping . The loosened material will be subsequently heaped with dozer and loaded into dumpers with front end loader .
Ripper Dozer, 770 hp	2	
Dozer, 400hp	1	
Dumper, 35t	6	
Drill, 150mm	1	50% of the production target to be achieved with drilling/ blasting
Explosive van	1	
Service van	1	
Pick up van	1	
Water tanker	2	
Diesel tanker	1	
Portable lights for face lighting	6	
Tractor	1	

The detailed justification for the requirement of major HEMM is given below:-

Hydraulic Excavator:



Productivity, t/hr. : 400
Annual working hrs. : 3600 hr. (@ 300 days/ yr., 2 shifts/ day & 6 hrs./ shift)
Production per m/c : 1.44 Mt
Production required : 3 Mt
Excavators required : 2.08 or say 2 Nos.

Dumper:

Productivity, t/hr. : 140
Lead, km (one way) : 1.5 km (max.)
Annual working hrs. : 3600 hr. (@ 300 days/ yr., 2 shifts/ day & 6 hrs./ shift)
Production per m/c : 0.50 Mt
Production required : 3 Mt
Dumpers required : 6 Nos.

Ripper Dozer:

Productivity, t/hr. : 280
Annual working hrs. : 3600 hr. (@ 300 days/ yr., 2 shifts/ day & 6 hrs./ shift)
Production per m/c : 1 Mt
Production required : 1.5 Mt (50% of the target to be achieved by ripping methodology)
Rippers required : 1.5 Nos. or say 2 Nos.

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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Drills:

Drill dia., mm	: 150
Burden x Spacing (mxm):	4 x 6
Penetration rate	: 15m/hr.
Drill factor	: 48 t/m
Productivity, t/hr.	: 720
Annual working hrs.	: 3600 hr. (@ 300 days/ yr., 2 shifts/ day & 6 hrs./ shift)
Production per m/c	: 2.59 Mt
Production required	: 1.5 Mt (50% of the target to be achieved by drilling/ blasting methodology)
Drills required	: 0.6 Nos. or say 1 No.


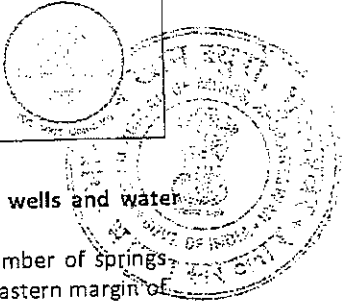
Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing, etc.

The broad blasting parameters of the primary blasting operations proposed to be carried out at Kodingamali are given below:

Burden	: 4 m
Spacing	: 6 m
Bench Height	: 10 m
Hole depth	: 11 m
Hole diameter	: 150 mm
Drilling pattern	: Square/ Staggered
Production required	: 1.5 Mt (50% of the target to be achieved by drilling/ blasting methodology)
Drill factor	: 48 t/m
Drilling required/ yr.	: 31250 m
Holes drilled/ yr.	: 3125 Nos.
Yield/ hole	: 480t
Holes to be fired/ week	: 65 Nos. (@ frequency of 1 blast/ week)
No. of holes fired per round	: 65 Nos.
No. of rounds fired	: 1 No.
Charge/ hole	: 90 kgs (@ 18kgs/m & charge length of 5 m/ hole)
Stemming length	: 6m
Charge/ round	: 5850 kgs
Charge per delay	: 90 kgs
Powder factor	: 5.33 t/kg.
Sequence of firing	: Broad 'V' pattern

Powder factor: The powder factor proposed to be achieved in blasting of ore at Kodingamali lease (inclusive of secondary blasting) will be around 5 t/kg.

Storage of explosives (like capacity and type of explosive magazine): Use of bulk explosive is envisaged and only a portable magazine of 500kgs capacity has been envisaged to store the high strength booster with accessories

	MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED		

3.0 MINE DRAINAGE

- a) **Minimum and maximum depth of water table based on observations from nearby wells and water bodies**

Kodingamali plateau top has no perennial streams flowing down the slope. But a number of springs originate from the foot hills of the plateau, the most prominent ones are towards the eastern margin of the area. Pathgarha Nadi, flows in north – easterly direction and is about 3.5 Km from the northern end of the area. It controls the regional drainage of the terrain. The average height of the Kodingamali plateau is around 300m and the depth of the workings will be to a maximum of 80m bgl from plateau top. Therefore, the ground water table will not be intersected during the mining operations. Moreover, water for de-dusting operations will be drawn from surface water and therefore the ground water quality will not be affected any way.

- b) **Indicate maximum and minimum depth of workings.**

The maximum/ minimum depth of workings at the end of 5 year period is given below.

Depth	At the end of plan period
Bottom bench floor mRL	1255
Top bench floor mRL	1175

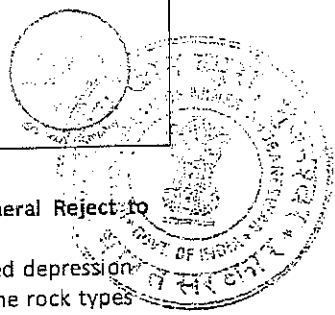
- c) **Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged**

Pathgarha Nadi, flows in north – easterly direction and is about 3.5 Km from the northern end of the area. It controls the regional drainage of the terrain. The average height of the Kodingamali plateau is around 300m and the depth of the workings will be to a maximum 80m bgl from the plateau top. Therefore, the ground water table will not be intersected during the mining operations. Moreover, water for de-dusting operations will be drawn from surface water and therefore the ground water quality will not be affected any way. Therefore, no pumping arrangements have been envisaged. However, garland drains have been envisaged to divert the surface run offs during rainy season through a settling tank. The same has been shown in the environment management plan.

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

The annual rainfall of the area is 1648mm. Pathgarha Nadi controls the regional drainage of the terrain. The water flowing through the quarry during rainy season will be diverted through a garland drain and passed through a settling tank prior to its discharge to the natural streams. The same has been shown in the environment management plan. The local drainage pattern of the area is shown in the figure below:-



DMC	MODIFIED MINING PLAN	
	KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED	



4.0 STACKING OF MINERAL REJECT /SUB GRADE MATERIAL AND DISPOSAL OF WASTE

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

The plateau top is a continuous stretch of flat land intercepted by small saucer shaped depression which is filled with soil & humus varying in thickness of few inches to about 1.5 ft. The rock types encountered in these deposits are mostly Khondalite, Bauxite, Laterite, Clay and Soil. No overburden/ waste & mineral rejects will be generated during the plan period. However, some top soil will be generated which will be used for avenue plantation/ mine reclamation. Year wise proposed quantities of top soil, OB & Mineral rejects are given below:-


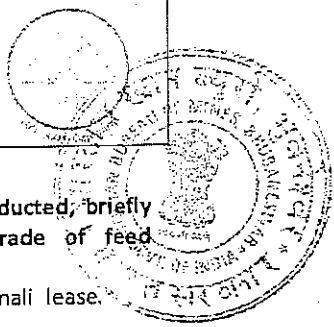
Year	Top Soil	OB/SB/ IB	Mineral Reject
	cu. m	(M. cu. m)	(M. cu. m)
1 st year	17,156	NIL	NIL
2 nd year	9,234	NIL	NIL
3 rd year	13,277	NIL	NIL
4 th year	15,041	NIL	NIL
5 th year	18,641	NIL	NIL
Total	73,349	NIL	NIL

- b) The proposed dumping ground within the lease area be proved for presence or absence of mineral and be outside the UPL unless simultaneous backfilling is proposed or purely temporary dumping for a short period is proposed in mineralized area with technical constraints & justification.
As no waste will be generated during the plan period, the question of its disposal does not arise. The top soil generated will be used for avenue plantation/ mine reclamation.
- c) Attach a note indicating the manner of disposal of waste, configuration and sequence of year wise build up of dumps along with the proposals for protective measures.
As no waste will be generated during the plan period, the question of its disposal does not arise.

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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5.0 USE OF MINERAL AND MINERAL REJECT

- a) Describe briefly the requirement of end-use industry specifically in terms of physical and chemical composition.
The ROM ore mined will be sized and dispatched to long term buyers for its use in their alumina plants. The chemical composition of such bauxite ore will be more than 40% of Al_2O_3 .
- b) Give brief requirement of intermediate industries involved in up-gradation of mineral before its end use.
No beneficiation process has been envisaged for up-gradation of the ore quality as the ROM ore itself is of good quality. The ROM ore mined will be sized and dispatched to long term buyers for its use in their alumina plants.
- c) Give detail requirements for other industries, captive consumption, export, associated industrial use etc.
The ROM ore mined will be sized and dispatched to long term buyers for its use in their alumina plants.
- d) Indicate precise physical and chemical specification stipulated by buyers
The ROM ore mined will be sized and dispatched to long term buyers for its use in their alumina plants. The chemical composition of such bauxite ore will be more than 40% of Al_2O_3 .
- e) Give details of processes adopted to upgrade the ROM to suit the user requirements.
No beneficiation process has been envisaged for up-gradation of the ore quality as the ROM ore itself is of good quality. The ROM ore produced is blended at the mine site itself and sized to the desired range suitable for its use in the alumina plants.
- f) The useable mineral recovered from ROM may not be directly used in any industry and may need intermediate process to suit the user industry in terms of physical and chemical compositions.
No beneficiation process has been envisaged for up-gradation of the ore quality as the ROM ore itself is of good quality. The ROM ore produced is blended at the mine site itself and sized to the desired range suitable for its use in the alumina plants.

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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6.0 PROCESSING OF ROM AND MINERAL REJECT

- a) If processing / beneficiation of the ROM or Mineral Reject is planned to be conducted, briefly describe nature of processing/ beneficiation. This may indicate size and grade of feed material and concentrate (finished marketable product), recovery etc.
 No mechanical processing or beneficiation of ore will be carried out at Kodingamali lease. Only screening & crushing will be done to produce the desired size fraction.
- b) Give a material balance chart with a flow sheet or schematic diagram of the processing procedure indicating feed, product, recovery, and its grade at each stage of processing.
 No mechanical processing or beneficiation of ore will be carried out at Kodingamali lease. Only screening & crushing will be done to produce the desired size fraction.
- c) Explain the disposal method for tailings or reject from the processing plant.
 Not applicable
- d) Quantity and quality of tailings /reject proposed to be disposed, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailings dam.
 Not applicable
- e) Specify quantity and type of chemicals if any to be used in the processing plant.
 Not applicable
- f) Specify quantity and type of chemicals to be stored on site / plant.
 Not applicable
- g) Indicate quantity (cum per day) of water required for mining and processing and sources of supply of water, disposal of water and extent of recycling. Water balance chart may be given.
 Not applicable, as no mineral processing will be carried out. Water will only be used for dust suppression of the haul roads, stock piles, plantation etc. which will be to the tune of around 90 KL per day.

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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7.0 OTHER



a) Site Services

The Kodingamali Bauxite Mine Lease is accessible through all weather motorable road via Lakshmpur Road Railway Station covering 57 km from Rayagada Railway Station of East Coast Railway. The extreme northern portion of the lease hold area, existing at top of the plateau, is 18 km away from Lakshmpur on Lakshmpur – Kodinga route falling on the right side of Lakshmpur – Koraput main road. The National Highway - 326 is also at around 8 km away from the proposed mining lease. All the amenities required as per the Mines Rules 1955 will be set up once the deed is executed.

b) Employment Potential:

The details of the proposed employment in the mine are as follows:

Position	Numbers
Executives	18
Supervisor	32
Technical operator (Mining)	88
Assistants (Mining)	34
Technical staff (Repairs & maintenance)	24
Assistants (Repairs & maintenance)	32
Crushing plant staff	28
Office staff	20
Others	54
Total	330

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 23 (B) OF MCDR'1988

8.1 Environment Base line information:

Environment plan of the mine is enclosed as Drg. No. MEC/11/16/Q78P/09. A copy of the baseline data is enclosed as Annex.-15. It can be observed from the summary of the observations that the ambient air quality, water quality etc. are within the permissible limits. The baseline data has been collected by M/s Vimta labs Ltd. The period of data collection has been between 1.12.2004 to 30.11.2005. The land-use in stages is shown in the table below:

Heads	Area (ha.)		
	As on 1.3.2016	At the end of 5 th year	At Conceptual Period
Mining	0.000	48.196	364.164
Roads	0.000	2.691	0.000
Infrastructure (magazine only/ min. sep. plant/ ore storage/ parking/ offices etc.)	0.000	10.350	45.813
Safety zone, 7.5m lease boundary	0.000	18.098	18.098
Total	NIL	79.335	428.075

Water regime

Kodingamali hill range in the lease area has several streamlets flowing down the hill slope which is mostly seasonal in nature. Principal drainage system of the area is Pathgarha river.

Quality of air, water and ambient noise level

The same is enclosed as Annex. – 15.

Flora and Fauna

The faunal presence of the area is participated by hare, porcupine, wild pig, squirrel, jackals and mongoose. The plateau top is generally devoid of any substantial vegetation giving the hill a bald look. The plateau top is marked by thorny bushes and a dwarf variety of date palm plant. The dwarf date palm is being considered lately as a botanical indicator for the aluminous deposits. At least a couple of varieties of grass thrive on the plateau surfaces by taking advantage of the thin layer of humas overlying the hard lateritic capping. Occasional sight of Murga and Kosala plants are also visible on the plateau top. Moreover, Khondalitic exposures support growth of trees and shrubs in the slopes and valleys only, not on the plateau top.

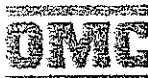

Climatic conditions

The area has a tropical climate with monsoon rains from June to September, and occasional winter rains. The area experiences cold weather between November and January when the temperature drops to less than 10° C. The temperature rises steadily from January onwards reaching 32°C - 40°C in summer i.e., the month of May. It experiences occasional gusty winds to heavy thunderstorms during summer (April – June). Monsoon breaks out in early to mid – June and continues upto September. The average annual rainfall of Koraput district is about 1648 mm under the influence of southwest monsoon. On an average, there are about 100 rainy days. The humidity is maximum (90%) in the months of July – August and minimum in February (36%). The wind velocity varies between 40 kmph and 80 kmph although occasional higher values have been reported. Lightening incidences are rarely reported in the area.

Human settlements

The details of the population of the villages in the buffer zone are given in the table below:-

Buffer zone distance in kms	Population, Nos.
0-3km	6494
3-7km	23627
7-10km	23090

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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Public buildings, places of worship and monuments

There is no place of archaeological or religious importance within 5 km of the lease.

Indicate any sanctuary is located in the vicinity of leasehold

No sanctuary is located in the vicinity of leasehold


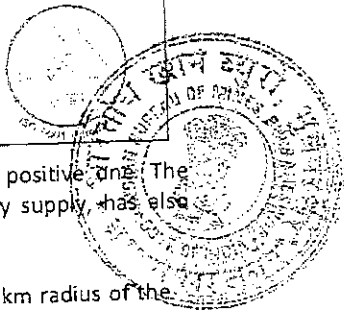
8.2 Impact Assessment: Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following:

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

Stage wise land use pattern is given below.

Heads	Area (ha.)		
	As on 1.3.2016	At the end of 5 th year	At Conceptual Period
Mining	0.000	48.196	364.164
Roads	0.000	2.691	0.000
Infrastructure (magazine only/ min. sep. plant/ ore storage/ parking/ offices etc.)	0.000	10.350	45.813
Safety zone, 7.5m lease boundary	0.000	18.098	18.098
Total	0.000	79.335	428.075

- i) **Air quality**
Air pollution due to dust is likely on account of movement of HEMM & tippers on the road. Dust is also likely to be generated due to crushing & screening operations.
- ii) **Water quality**
Water regime is not likely to be intercepted during the mining operations. However, surface water quality is likely to be affected due to increase in suspended solids only on account of movement of water through the quarry, especially during monsoons.
- iii) **Noise levels**
Noise pollution is likely on account of movement of HEMM & tippers.
- iv) **Vibration levels (due to blasting)**
Vibration (due to blasting) is anticipated due to deep hole blasting operations.
- v) **Water regime**
Kodingamali plateau top has no perennial streams flowing down the slope. But a number of springs originate from the foot hills of the plateau, the most prominent ones are towards the eastern margin of the area. Pathgarha Nadi, flows in north – easterly direction and is about 3.5 Km from the northern end of the area. It controls the regional drainage of the terrain. The average height of the Kodingamali plateau is around 300m and the depth of the workings will be to a maximum 80m bgl from the plateau top. Therefore, the ground water table will not be intersected during the mining operations. Moreover, water for de-dusting operations will be drawn from surface water and therefore the ground water quality will not be affected any way.
- vi) **Acid mine drainage**
Not applicable
- vii) **Surface subsidence**
Not applicable
- viii) **Socio-economics**
This mining employment has greatly benefited the income levels of the natives. In addition, creation of comparatively well paid jobs in the area has generated not only sizeable trade in household supplies (including vegetables, milk, food, textile, etc) but also some household employment. It has also generated demand for tertiary services like transport and repair shops.

	MODIFIED MINING PLAN XODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED	

The impact of mining operations in the area on socio-economic has been a positive one. The infrastructure of the area roads, public transport P&T facilities and electricity supply, has also improved after the advent of mining operation in the area.

ix) **Historical monuments etc.**

There are no historical monuments or places of archeological interest within 5 km radius of the lease.

8.3 **Progressive Reclamation Plan:**

8.3.1. **Mined-Out Land: Describe the proposals to be implemented for reclamation and rehabilitation of mined-out land including the manner in which the actual site of the pit will be restored for future use. The proposals may be supported with yearly plans and sections depicting yearly progress in the activities for land restoration/ reclamation/rehabilitation, afforestation etc, called "Reclamation Plan".**

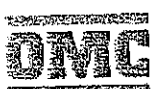

The plateau top is a continuous stretch of flat land intercepted by small saucer shaped depression which is filled with soil & humus varying in thickness of few inches to about 1.5 ft. No overburden/ waste & mineral rejects will be generated during the plan period. However, some top soil will be generated which will be used for avenue plantation/ afforestation over the mine benches. The mine has been designed in such a fashion that its benches reach its ultimate pit limit in sequential manner w.e.f 2nd year onwards so that the berm width can be utilised for afforestation. Pits of 1m x 1m x 1.5 m will be dug out and filled with the top soil alongwith some manure. Local species will then be planted over these pits which will be prepared in a grid of 3m x 3m over the stable mine berms. The year wise area reclaimed area & plantation proposed to be carried out is shown in the table below:-

Year	Mine level, mRL	Area made available for afforestation, Ha.	Saplings to be planted, Nos.
1 st Yr.	N.A	NIL	NIL
2 nd yr.	1255 mRL	0.30	330
	1245 mRL	1.01	1100
	Sub total	1.31	1400
3 rd yr.	1235 mRL	1.04	1100
	1225 mRL	1.75	1900
	Sub total	2.79	3000
4 th yr.	1215 mRL	3.48	3800
5 th yr.	1205 mRL	3.60	4000
Grand total		11.18 Ha.	12200 Nos.


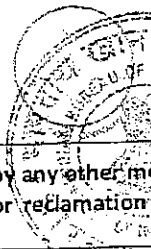
The same has also been shown in the progressive mine closure plan drawing.

8.3.2 **Topsoil Management: The topsoil available at the site and its utilization may be described. Year-wise generation of topsoil is given in table below. The same will be used for avenue plantation/ mine reclamation.**

Year	Top Soil Generation, cu. m
1 st year	17,156
2 nd year	9,234
3 rd year	13,277
4 th year	15,041
5 th year	18,641
Total	73,349

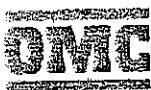
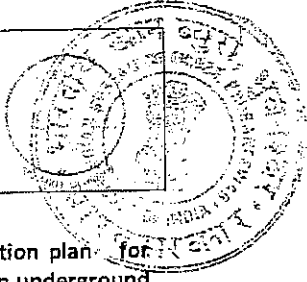
	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 423.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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- 8.3.3 Tailings Dam Management: The steps to be taken for protection and stability of tailing dam, stabilization of tailing material and its utilization, periodic desilting measures to prevent water pollution from tailings etc, arrangement for surplus water overflow along with detail design, structural stability studies, the embankment seepage loss into the receiving environment and ground water contaminant if any may be described.
Not applicable
- 8.3.4 Acid mine drainage, if any and its mitigative measures.
Not applicable

	<p align="center">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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8.3.5 Surface subsidence mitigation measures through backfilling of mine voids or by any other means and its monitoring mechanism. The information on protective measures for reclamation and rehabilitation works year wise may be provided as per the following table.

Items	Details	Actual till 1.3.2016	1 st year	2 nd year	3 rd year	4 th year	5 th year
Dump management	Area afforested (ha)	NIL	NIL	NIL	NIL	NIL	NIL
	No of saplings planted	NIL	NIL	NIL	NIL	NIL	NIL
	Cumulative no of plants	NIL	NIL	NIL	NIL	NIL	NIL
	Cost including watch and care during the year	NIL	NIL	NIL	NIL	NIL	NIL
	Retaining wall	NIL	NIL	NIL	NIL	NIL	NIL
	Garland drain	NIL	NIL	NIL	NIL	NIL	NIL
	Settling tank	NIL	NIL	NIL	NIL	NIL	NIL
Management of worked out benches	Area available for rehabilitation (ha)	NIL	NIL	1.3	2.79	3.48	3.60
	Afforestation done(ha)	NIL	NIL	1.3	2.79	3.48	3.60
	No of saplings planted in the year	NIL	NIL	1400	3000	3800	4000
	Cumulative no of plants	NIL	NIL	1400	4400	8200	12200
	Any other method of rehabilitation (specify)	NIL	NIL	Plantation over mine benches			
	Cost including watch and care during the year, Rs. In lakhs	NIL	NIL	2.1 lakhs	4.5 lakhs	5.7 lakhs	6.0 lakhs
Reclamation and Rehabilitation by backfilling	Void available for Backfilling (L x B x D) pit wise /stope wise	NIL	NIL	NIL	NIL	NIL	NIL
	Void filled by waste /tailings	NIL	NIL	NIL	NIL	NIL	NIL
	Afforestation on the backfilled area	NIL	NIL	NIL	NIL	NIL	NIL
	Rehabilitation by making water reservoir	NIL	NIL	NIL	NIL	NIL	NIL
	Any other means (specify)	NIL	NIL	NIL	NIL	NIL	NIL
Rehabilitation of waste land within lease	Area available (ha)	NIL	3.6 km (along avenues)				
	Plantation carried out	NIL	480 Nos.	480 Nos.	480 Nos.	480 Nos.	480 Nos.
	Check dams	NIL	1 No.	NIL	NIL	NIL	NIL
	Method of rehabilitation	NIL	NIL	NIL	NIL	NIL	NIL
Others (specify)	Retaining wall	NIL	1.3km	NIL	NIL	NIL	NIL
	Garland drain with settling tank		1.3 km with 1 No. settling tank	NIL	NIL	NIL	NIL
	Cost of environment monitoring, Rs. In lakhs	10 lakhs	10 lakhs	10 lakhs	10 lakhs	10 lakhs	10 lakhs

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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8.4 Disaster Management and Risk Assessment: This may deal with action plan for high risk accidents like landslides, subsidence flood, inundation in underground mines, fire, seismic activities, tailing dam failure etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authority may also be described.

The objective of on-site disaster management plan for the mine is to be in a state of perpetual readiness through training and development to immediately control and arrest any emergency situation so as to avert a full-fledged disaster and the consequence of human and property damage and in the event of a disaster still occurring, to manage the same so that the risk of the damage to life and property is minimized.

Key elements of a disaster management plan are.

- i. Risk Identification
- ii. Preventive measures for potential risks.
- iii. Defining the responsibility at different levels to tackle the hazard situation & establishing an effective communication channel for flow of information.
- iv. Action plan for handling the emergency situation i.e. on-site & off-site.
- v. Establishing emergency response centres.

i. Risk Identification

Following risks have been identified for Kodingamali Bauxite Mine:-

1. Surface fire.
2. Failure of slope in the bench & dumps.
3. Fly rock from blasting operations
4. Possible accidents due to HEMM

1. Code of Practice in Case of Fire at Mines

Source of Fire:-


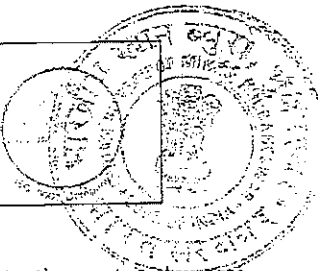
- i) HEMM
- ii) Oil & Lubricant Room.
- iii) Diesel Pump/storage area
- iv) Electrical equipment/substations

Line of Action:-

- i. Any person notices any sign of fire shall start shouting FIRE, FIRE to seek assistance and also immediately take steps to give warning by blowing the siren continuously and take steps to extinguish the fire by using appliances available near the site.
- ii. **Duties of Mine Official:-** The Mine officials receiving the warning shall forthwith inform following on Phone.
 - Fire fighting station – for sending fire-fighting team.
 - Security main gate – to inform senior person and to prevent un authorized entry.
 - Shift Engineer – to manage with available resources till then.
 - Mines Manager – for overall supervision and control.

After giving information reach the spot, remove Man & Machinery and take steps to tackle the fire in accordance with the fire fighting instructions. Inform at security office to get Ambulance if required.

- iii. **Duties of Fire Fighting Team:-** On receiving warning the team shall reach the site of fire and depending on its nature, class and extent shall take steps to extinguish it and rescue persons if involved in fire.

	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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iv. **Duties of Mines Manager: -**

- On receipt of information about fire the Manager shall forthwith rush to the spot and assess the extent of fire. He shall supervise the fire fighting operation and make necessary arrangement for medical aid to affected person, if any.
- Inform to senior officials and statutory bodies

2. **Failure of slope in the bench & dumps.**

Bench & dump slope stability depends upon the physic-mechanical properties of the rock such as UCS, coefficient of internal friction, angle of repose, cohesion etc., presence of water, water pressure, joint spacing & orientation, type of rock etc. joint mapping & its stereo plotting shall be carried out to determine the possibility of failure and type of failure, if any. Dump slope failure occurs mainly due to accumulation of water in dumping areas, formation of gullies in the dump slopes, improper terracing/dumping etc. The well-developed drainage system over the lease area ensures that storm water does not accumulate in the lease area and therefore hydrostatic pressure remains at a low level. Geo-technical investigation & slope stability analysis and inspection of bench slopes shall be carried out.

Line of Action

- i) In the advent of slope failure following personnel shall be immediately informed.
 - a. Shift incharge : to manage the situation within available resources.
 - b. Security main gate – to inform senior person and to prevent un-authorized entry.
 - c. Mines Manager – for overall supervision and control.
 - d. Nearby Hospital – for providing medical aids

After giving information reach the spot, remove Man & Machinery and take steps to tackle the situation in accordance with the safety instructions. Inform at security office to get Ambulance if required.

3. **Fly rock from blasting operation**

Main reason of fly rock due to blasting is Improper blast design i.e less stemming, inadequate burden & spacing, high charge concentration, improper delay, presence of geological discontinuities such as joints, faults, muds etc.

Following measures shall be taken to prevent accident due to fly rock.


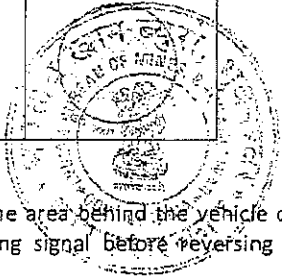
- Blasting operation shall be carried out under the supervision of assistant manager/manager (Blasting)
- Code of signaling should be strictly followed during blasting.
- Proper blast design
- Controlled blasting should be adopted.
- No person other than required for blasting shall be allowed to enter the mines during blasting.

4. **Possible accidents due to HEMM**

Following safety measures shall be taken to prevent an accident due to HEMM.

a. **General Safety Procedures During Dumper/Tipper Operation**

- Before moving the dumper/tipper, always give a warning signal. Sound the following code horn before moving the vehicle:
 - Moving forward - 2 beeps
 - Moving backward - 3 beeps
- During operation of dumper/tipper, always keep the cabin doors closed.
- During night, always use dipper while approaching an oncoming vehicle.


	<p style="text-align: center;">MODIFIED MINING PLAN KODINGAMALI BAUXITE LEASE (AREA: 428.075 Ha.) APPLICANT: ODISHA MINING CORPORATION LIMITED RQP : MECON LIMITED</p>	
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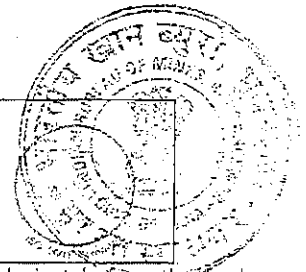
b. Safety procedures during travelling of dumper/tipper

- Operate the dumper/tipper in reverse only if there is a clear view of the area behind the vehicle or with the assistance of an authorized spotter. Give an audible warning signal before reversing a dumper/tipper.
- Where there are no separate lanes for two-way traffic, give way to the oncoming dumper/tipper cautiously.
- As far as possible, avoid turning the dumper/tipper on a slope. It may cause the machine to roll over or slip sideways.
- As far as possible, do not reverse loaded dumper/tippers on gradient.
- Before starting up or down a grade, select a transmission gear range that will ensure safe driving and provide control of the vehicle under all conditions.
- Negotiate downhill gradients in low gear so that minimum of braking is required.
- Do not shift gears or run the dumper/tipper in neutral on steep down slopes.
- Do not drive dumper/tipper over sharp stones and boulders.
- If any stone or boulder is found on the road, inform the spotter or incharge to get it removed to avoid any damage to the machine components.

c. Safety Procedures During Operation

- Always press the accelerator pedal gradually so as to achieve smooth acceleration.
- Do not operate the steering wheel fast. This may overturn the dumper/tipper.
- Do not brake suddenly.
- Avoid fanning the treadle by partial, intermittent applications while using service brakes as this may cause reduction in air pressure level to dangerous limits. So use service brakes sparingly and only when necessary.
- Use the right gear and speed to match load conditions.
- Before engaging the transmission from neutral to forward or reverse, ensure that the engine is at idle speed. Before shifting the gear from forward to reverse or reverse to forward, apply brakes to completely stop the dumper/tipper, otherwise the transmission may get damaged.
- Shift the gears from one to five one by one, otherwise the transmission may get damaged.
- Use retarder brake sparingly as excessive use of retarder brake heats up the transmission. Retarder brake should not be applied for more than 30 seconds at a time.
- Do not use dump brakes while the dumper/tipper is in motion.
- Except in case of emergency, use parking brake only for parking the dumper/tipper.
- Never take the dumper/tipper too close to an overhang or an unsafe edge that may collapse.
- Pull into the loading area with caution. Remain at a safe distance while dumper/tipper ahead of you is being loaded.
- When approaching loading equipment, sound the audible warning signal and do not attempt to pass the loading equipment unless there is a proper audible signal in reply.
- Avoid backing over rocks at the shovel and dump areas.
- For loading, place the dumper/tipper on a level ground.
- When the dumper/tipper is being loaded, stay in the dumper/tipper cab or sufficiently far enough from dumper/tipper to avoid being struck by flying fragments.
- When the dumper/tipper is being loaded, do not take your head out of the cab window.
- Ensure that the dumper/tipper is not overloaded and the material is not loaded in such a way so as to project horizontally beyond the sides of its body.
- Do not drive nose-to-tail particularly behind a vehicle with twin rear wheels, from which a stone piece wedged between tyres may fly back into the windscreen of your vehicle. Maintain a distance of 50 feet on level ground and 100 feet on a ramp from the vehicle in front of you.
- If the lights at the crusher hopper are on (indicating that the material should not be dumped into it), do not unload the dumper/tipper.

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- While raising the dumper/tipper body, release the accelerator pedal slowly just before the body reaches the desired position.
- After dumping the material, move the dumper/tipper only after completely lowering the dump body.
- Never turn front wheels, particularly on loaded dumper/tippers unless the dumper/tipper has some fore or aft movement. Such stress can literally shear the tread from the carcass.

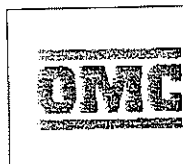
d. Safety Procedures During Dumping/Tipping

The operator should take the following precautions during tipping on stockpiles and dumping of overburden:

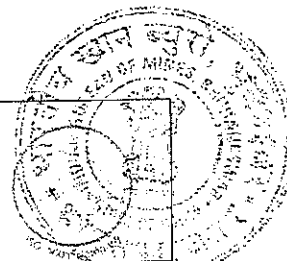
- While doing the first tipping, it should be done at a distance of 3 meter from the edge.
- On entering a tipping/dumping area, the operator should visually check the general area of the tip, especially in the dumping area.
- Backing visibility is available only to the driver's side of the dumper/tipper. So make sure that there are no personnel or any obstructions on the other side.
- All care should be taken regarding the positioning of the dumper/tipper's rear wheels at the tipping face. A dumper/tipper should not back up to an area that has not been visually inspected by the operator.
- If a spotter is present, follow his signals.
- Be especially careful of soft edges and cracks.
- When dumping in an area where no berm is present (e.g. construction of a new haul road where material would be laid down in layers), material should be tipped short of any edge.
- Dumper/tippers tipping over the berm should back up squarely to the berm.
- After positioning the dumper/tipper for tipping, the operator should raise the hoist only after making sure that the dumper/tipper is stationary and on a level ground, transmission is in neutral and dumping brakes are applied.
- As soon as the material has been dumped out from the dumper/tipper, release dump brake, shift transmission into 1st or 2nd forward gear and at the same time depress the accelerator pedal to move away from the dump area slowly and carefully.
- As the dumper/tipper starts moving, pull the hoist control lever all the way down to lower the dump body.
- During these operations, do not stop anywhere for unnecessary reasons and the operator must always remain in the cabin.
- If at any time the operator considers the operation unsafe, it should be immediately reported to the manager or the in charge.

e. Safety Procedures While Parking

- When not in use, move the dumper/tipper and park it at a proper parking place.
- While parking the dumper/tipper at the workshop or work site, do not park in a haphazard way.
- When parking the machine, park it in a safe place outside the working area or in the specified place. It should be parked on flat, firm ground where there is no danger of rock falls or landslides. Ensure that the gear is in neutral position before stopping the engine. Make sure that the dump body is in down position. Apply parking brakes. While leaving the operator's seat, switch off the engine and all the electrical accessories that are not in use, remove the ignition key and lock the cabin.
- While parking the dumper/tipper always apply parking brakes.
- Do not stop or park on a haul road unless unavoidable. If you must stop, move dumper/tipper to a safe place. If this is impossible, adequately fence the area with big enough boulders to caution other operators.
- If a disabled dumper/tipper is to be left on a haul road, apply parking brake and block the wheels securely. Adequately fence the area with big enough boulders to caution other operators.
- Never park the dumper/tipper on slopes.
- If the conditions are such that the dumper/tipper has to be parked on a slope, apply parking brakes, steer the wheels away from center and block the wheels securely.



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- As far as possible, park the machine on a level ground. Correct level of lubricants is indicated only if the machine is parked on a level ground.

Fixing the Responsibility & establishing communication channel

Following officers of the mines will be responsible for co-ordination in case of emergency situation in any part of the mine.

Person	Responsibility
Head of Department / Mine Agent	Site Controller
Mines Manager / Shift in-charge	Accident Controller / Communication Officer
Employee who gives the first information about the incident / accident	Primary Controller
P & A Department (HOD)	Liaison Officer

Key Personnel and their responsibilities

Site Controller:

- The head of the department / mine agent shall have an overall responsibility for controlling the incident / accident and directing the personnel.
- To prepare a full proof plan for control of accident like, slope failure, fire, fly rock, flood and other natural calamities.
- To inform statutory bodies of the State and Central Government.
- To inform communication officer about the emergency, control centre and assembly point.
- To provide all assistance and call for fire squad, security officer and other services required for removing / control of danger.
- To ensure that all necessary personnel assemble at assembly point.
- Make arrangement for medical treatment to the personnel injured seriously.

Accident Controller:

- Mines manager shall act as accident controller/ communication officer.
- Mock rehearsal of management plan prepared for accident.
- To withdraw men / machine from the affected area with priority for safety of personnel, minimize damage to the machines, environment and loss of material.
- To make a report based on the facts and figure and submit to the site controller.
- To communicate to the site in charge and make arrangement for first aid and transportation of the injured personnel.

Primary Controller:

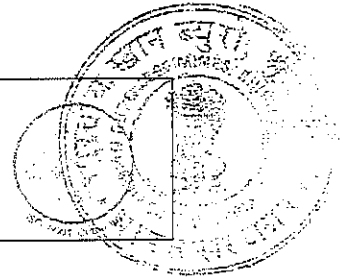
- To inform the Accident Controller / shift in-charge from the nearest means of communication about the location and the nature of accident.
- To assist in clearing any obstruction in relief of accident.
- To carry out all instructions of accident controller.
- To provide first aid treatment and communicate to the shift in-charge.

Emergency Control Centers

The emergency control center is the place from where the operations to handle the emergency will be directed and coordinated. The site main controller, key personnel and the senior officers of the fire and police services will attend it. The center will be equipped to receive and transit information and directions from and to the incident controller and other areas of the works, as well as outside.



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Emergency control centers will therefore contain the following:

- (a) In-charge of external telephone;
- (b) An adequate of internal telephones;
- (c) A plan of the works, to show:
 - (i) Areas where there are large inventories of hazardous materials, if any;
 - (ii) Sources of safety equipment;
 - (iii) The fire-fighting system.
 - (iv) Site entrance and roadways, including up-to-date information on roadworks;
 - (v) Assembly points;
 - (vi) The location of the mines in relation to the surrounding community;
- (d) Notepads, pens and pencils;
- (e) A nominal roll of employees;
- (f) A list of key personnel, with addresses, telephone numbers, etc. The emergency control center should be sited in an area of minimum risk.

Role of the Police

The police normally assume the overall control of an emergency, with a senior officer designated as emergency coordinating officer. Normal duties of the police during an emergency include protecting life and property and controlling traffic movements. The functions include controlling bystanders, evacuating the public, identifying the dead and dealing with casualties and informing relatives of dead or injured.

Role of the Fire Authorities

The control of a fire is normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire brigade officer may also have a similar responsibility for other events, such as explosions and toxic releases. Fire authorities having major hazard works in their area should have familiarized themselves with the location on site of all stores of flammable materials, water and foam supply points and fire-fighting equipments.

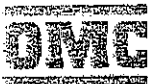
Role of the Health authorities

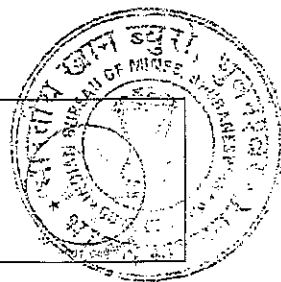
Health authorities, including doctors, surgeons, hospitals, ambulances and so on, have a vital part to play following a major accident and they should form an integral part of any emergency plan. For major fires, injuries will be the result of the effects of thermal radiation to a varying degree and the knowledge and experience to handle this in all, but extreme, cases may be generally available in most hospitals.

Capability of Lessee:

Following facilities are available at mine site:

- Telephone / Mobile handsets
- Runners / Messenger
- Emergency alarm
- Fire fighting equipment and accessories with trained manpower
- Training centre
- Fire extinguishers
- Dispensary & Ambulance van
- Jeeps

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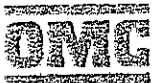
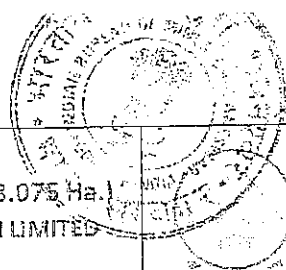
List of contact person of mines in case of emergency is given below.

Name	Designation & Department	Address	Contact No.
Shri Gangadhar Nayak	Regional Manager	Regional Office, Rayagada OMC Ltd., Barijhol, Rayagada PIN – 765001, Odisha	09438714640/ 06856-235335
Shri Ghanshyam Sahoo	Sr. Manager	Regional Office, Rayagada OMC Ltd., Barijhol, Rayagada PIN – 765001, Odisha	09861768472/ 06856-235335
Shri A. Sahoo	Dy. Manager	Regional Office, Rayagada OMC Ltd., Barijhol, Rayagada PIN – 765001, Odisha	06856-235335
Shri. T. Panigrahi	Geologist	Regional Office, Rayagada OMC Ltd., Barijhol, Rayagada PIN – 765001, Odisha	09437196442/ 06856-235335
Shri. T. Gurunath	Surveyor	Regional Office, Rayagada OMC Ltd., Barijhol, Rayagada PIN – 765001, Odisha	06856-235335

8.5 Care and maintenance during temporary discontinuance: An emergency plan for the situation of temporary discontinuance due to court order or due to statutory requirements or any other unforeseen circumstances may indicate measures of care, maintenance and monitoring of status of discontinued mining operations expected to re-open in near future.

When the mine is temporarily discontinued due to any unforeseen circumstances the following care and maintenance shall be carried out:

- Notice to be served to all the concerned authority.
- Temporary fencing shall cover the mine entries.
- All access roads/openings to the pit / face shall be closed by parapet wall as per rule.
- Warning shall be displayed on the 'Notice Board' at appropriate places.
- Security personnel shall be posted at every danger point.
- No unauthorized person shall be allowed to enter into the mine without prior permission of the management.
- Garland drain shall be made all around the mine and dumps to prevent water flow towards mine for prevention of landslide/side fall and siltation etc.
- All men and machinery shall be withdrawn from the mine and shall be kept in a compound and safe place.

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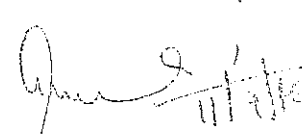
8.6 FINANCIAL ASSURANCE:

The amount calculated for the purpose of Financial Assurance based on the CCOM's Circular no. 4 of 2006 is given below.

Sl. No.	Head	Area put on use at start of plan (Ha) as on 1.3.2016	Additional requirement during first five years	Total (Ha)	Area considered as fully reclaimed & rehabilitated (Ha)	Net area considered for calculation
1	Area under mining	0.000	48.196	48.196	0.000	48.196
2	Roads	0.000	2.691	2.691	0.000	2.691
3	Infrastructure (magazine only/ min. sep. plant/ ore storage/ parking/ offices etc.)	0.000	10.350	10.350	0.000	10.350
4	Dumps	0.000	0.000	0.000	0.000	0.000
5	Railways	0.000	0.000	0.000	0.000	0.000
6	Township area	0.000	0.000	0.000	0.000	0.000
7	Tailing pond	0.000	0.000	0.000	0.000	0.000
8	Others	0.000	0.000	0.000	0.000	0.000
9	Grand total	0.000	61.237	61.237	0.000	61.237

The financial assurance proposed to be paid for an area of 61.237 ha. @ Rs. 25,000/- per ha. is Rs. 15,30,925/- which will be valid for the first five years w.e.f the date of ML deed execution. The financial assurance plan is enclosed as Drg. No. MEC/11/16/Q78P/11.

अनुमोदित
APPROVED


 क्षेत्रीय खान नियंत्रक
 REGIONAL CONTROLLER OF MINES
 भारतीय खान ब्यूरो
 INDIAN BUREAU OF MINES
 भुवनेश्वर/ BHUBANESHWAR

