



No.8(21)02/2000-FCE

10th September, 2021

To

The Addl. Director General of Forests (FC),
Ministry of Environment, Forest & Climate Change,
Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj,
New Delhi – 110 003.

Sub: Proposal for non-forestry use of 306.047 ha of forest land for Chromite ore mining in village Kaliapani, Gurujanpal, Sukurangi, Saruabil and Forest Block No.27 of South-Kaliapani Chromite Mines in favour of OMC.

Ref: Ministry's letter No.8-15/2000-FC (Vol.) dated 02.06.201.

Sir,

With subject and reference cited above, I am to enclose herewith the Field inspection report conducted by DIGF (C), IRO, MoEF&CC, Bhubaneswar on 10.08.2021. She has included the status of compliances of stipulated conditions of Stage-II approvals dated 08.06.2001 and 25.02.2016 along with comprehensive status of reclamation of mined over/abandoned portions of the forest area as per approved mining plan.

Encl: As above:

Yours faithfully,

B. Ranjan 10/9/2021
(Bivash Ranjan)

Dy. Director General of Forests (C)

FIELD INSPECTION REPORT IN RESPECT OF DIVERSION OF 425.398 ha (146.047 ha + 279.351 ha) OF FOREST LAND PERTAINING TO SOUTH KALIAPANI CHROMITE MINES OF M/s ODISHA MINING CORPORATION LIMITED UNDER CUTTACK FOREST DIVISION.

The field inspection was carried out by the undersigned on 10th August, 2021 along with Shri M.R. Prasad, Scientist-B of this office, Sri Sarat Kumar Sahu, ACF, Cuttack Division, Dr D.K. Pattanaik, Advisor (F&E), Mr. Prasanna Kumar Swain, RM, J.K. Road, Mr. Kathi Pradhan, D.G.M.(M), Mines Manager, Mr. Bhajahari Khuntia, Sr. Manager (Geo.), Dr. Kumarmani Meher, Manager (F&E), Mr. B.N. Mohapatra, Manager (Survey), Mr. Nishikanta Samal, Manager (M).

BACKGROUND:

The Stage-II Forest Clearance over 146.047 ha of already broken up forest land (pre-1980) was granted by MoEF & CC vide letter F.No. 8-15/2000-FC with validity for 15 years i.e. up to 07.06.2016. FAC during its meeting held on 28.11.2014 had recommended that the period of validity of the approval accorded under FC Act for diversion of 146.047ha of forest land accorded by MoEF & CC vide letter dtd.08.06.2001 may be made co-terminus with the validity of the mining lease till 21.01.2020 subject to submission of either credible proof in support of their claim that the said forest land was indeed broken prior to 1980 or identify non-forest land or revenue forest land equal in extent to the said forest land suitable for creation of Compensatory Afforestation in lieu of the said forest land and submit details including requisite maps of the same along with a detail scheme for creation and 7 to 10 year maintenance of Compensatory Afforestation thereon and the same had been communicated by the Ministry vide their letter F.No.8-15/2000-FC (Vol) dtd.08.01.2015.

Thereafter, the State Govt. vide letter No.10F(Cons)76/2015/8284/F&E dtd.18.05.2015 had recommended the compliance to the Ministry with a request to extend the mining lease period of South Kaliapani Chromite Mines till 31.03.2020 as per Section 8(A)(8) of MMDR Amendment Ordinance, 2015.

In the meantime, the Ministry had conveyed the approval under FC Act, 1980 for diversion of 279.351 ha (425.398ha-146.047.ha) of additional forest land including 2.790ha of safety zone in addition to 146.047ha of forest land already diverted within the total mining lease area of 552.457ha of South Kaliapani Mines in favour of OMC vide letter dtd.26.02.2016. Subsequently to the grant of

forest clearance for the total forest land within ML, the supplementary lease deed have been executed on 12.08.2016 upto 21.01.2030 under Rule 3(1) of Mineral (Mining by Govt. Company) Rule, under which the lease is deemed to be granted for 50 years from the date of original grant i.e. 22.01.1980.

In this context, State Govt. vide letter dated 18.03.2020 recommended for extension of validity of the forest clearance over 425.39 ha within South Kaliapani Chromite Mines upto 21.01.2030 i.e. co-terminus with the lease period.

During the field inspection to South Kaliapani mines, the following were inspected:

1. The mining area including OB dumps and ETP.

The Field inspection report is submitted with the following points:

1. **Status of conditions stipulated in stage-II Forest clearance for diversion of 146.047 ha granted vide Ministry's letter of even no. dated 08.06.2001 and stage-II forest clearance letter of even no. dated 25.02.2016 for diversion of 279.351 ha of forest land in the mining lease area.**

- (i) Legal status of forest land shall remain unchanged.

OMC pursued the matter with the State Government to keep the legal status of the forest land diverted under this approval unchanged.

- (ii) Mining shall be done as per the approved mining plan. The reclamation of mined out areas will be done concurrently in consultation with the State Forest Department at the project cost. The progress of reclamation shall be assessed by the State Forest Department and the Regional Office, Bhubaneswar periodically.

Mining is being carried out in phased manner as per the approved mining plan by IBM. As per approved mining plan, reclamation has not been proposed till 2019-20.

- (iii) The user agency will transfer the cost of fencing, protection, regeneration and maintenance of the safety zone area and afforestation over one and half times of safety zone area in degraded forest land elsewhere (revised as on date to incorporate existing wage structure) in favour of the State Forest Department and the State Government will place this fund with the DFO/DCF responsible for implementing the above-mentioned conditions.

Complied. Plantation has been carried out in safety zone area. The safety zone has been visited during site inspection.

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

Mining lease has been demarcated on the ground using four feet high reinforced Cement concrete pillars inscribed with serial numbers, forward & back bearings and distance from pillar to pillar. This was inspected during field inspection.

- (v) No felling of trees shall be done within the lease area unless it is really warranted for mining and such felling should be done with the prior permission and the conditions imposed by the concerned DFO.

Tree felling within the mining lease area is being done by OMC, only when it is absolutely necessary and unavoidable, under the supervision of DFO, Cuttack Forest Division.

- (vi) The user agency will make arrangements for free supply of fuel wood preferably alternate energy source to labourers and staff working on the project site, so to avoid any pressure on the adjacent forest areas.

Free electricity is provided by OMC to the staff working at the site. Further, the labourers are coming from the nearby villages to the working site and they depend on gas connection available in the nearby market and therefore no biotic pressure on the adjoining forest area is felt.

- (vii) The period of permission under the Forest (Conservation) Act, 1980 will be for 15 years w.e.f. the date of issue of this order subject to Environmental Clearance under the Environment (Protection) Act, 1986, if applicable.

Mining lease period of South Kaliapani Chromite Mines has been extended up to 21.01.2030 vide Govt. of Odisha, Steel & Mines Dept. order no. III (CR) SM-03/2015 2713/SM, dated 04.04.2016. Supplementary lease deed has been executed on 12.08.2016.

Environmental Clearance has been obtained vide letter no. J-11015/407/2008-IA.II dated 20.07.2010 for production of 1.4 MTPA of Chrome Ore.

- (viii) The area will not be used for any other purpose other than that specified in the proposal.

The diverted forest land is being used for the purpose that has been specified in the proposal.

- (ix) The State Government will not allot the remaining forest land (for which request has been made in the proposal for diversion but same has not been approved for diversion by the Central Government) to any other for mining/other purposes. Request of the State/user agency for fresh forest land will be considered during new renewal.

Stage-II Forest Clearance over the balance forest land of 279.351 ha has been granted by MoEF&CC vide letter no. 8-15/2000-FC (Vol.) dated 25.02.2016.

- (x) Any other condition that the State Government or the Chief Conservator of Forests (Central), Regional Office, Bhubaneswar may impose from time to time in the interest of afforestation, conservation and management of flora and fauna of the area.

OMC has abided by the conditions stipulated by the Regional Office of MoEF & CC from time to time in the interest of conservation protection and development of forests & wildlife.

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Status of Compliance to the conditions in respect of diversion of 279.351 ha of forest land including 2.790 ha for safety zone in addition to 146.047 ha of forest land already diverted within total mining lease area of 552.457 ha for Chromite ore mining by M/s OMC during 1st RML period.

- (i) Legal status of forest land shall remain unchanged.

Complied.

- (ii) Compensatory afforestation shall be raised and maintained over the non-forest land equal in extent to the forest land being diverted from funds realized from the user agency.

Complied. As reported in Part-II, above.

- (iii) The non-forest land which is transferred and mutated in favour of the State Forest Department for the purpose of compensatory afforestation shall be declared as Reserved Forest under Section-4 or Protected Forest under Section-29 of the Indian Forest Act, 1927 or under the relevant Section(s) of the local Forest Act. The Nodal Officer must report compliance within a period of six (6) months and send a original notification of RF/PF as the case may be to the Central Government for confirmation and record.

Complied. As reported in Part-II, above.

- (iv) Following activities shall be ensured by the State Govt. at the project cost:
- a) An approved plan for appropriate mitigative measures to minimize soil erosion and choking of streams may be implemented.

Complied. As reported, a plan on mitigative measures to minimize soil erosion and choking of streams has been prepared and approved by the RCCF, Angul with a financial outlay of Rs. 1.262 Lakhs. The User Agency has constructed 1300 meters of retaining wall and 2200 meters of garland drains in different part of the mining lease area to minimize soil erosion with an expenditure of Rs. 98, 00,000/-. This was inspected during the field inspection.

- b) Planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within the mining lease to arrest soil erosion.

Complied. As reported, a scheme has been prepared and approved by the RCCF, Angul for planting of adequate drought hardy plant species and sowing of seeds in the appropriate area within the mining lease to arrest soil erosion with a financial outlay of Rs. 57.79 Lakhs. Plantation has been carried out in the dead benches of OB dump with species like Sissoo, Neem, Acacia, Karanja, Teak, Simaruba, Chakunda, Sisira, Arjuna, etc.

- c) Construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour.

Complied. As reported, a scheme including construction of check dams, retention /toe walls to arrest sliding down of the excavated material along the contour has been prepared and approved by the RCCF, Angul with a financial outlay of Rs. 4.06 Crores. The User Agency has constructed Check dams, retention wall and garland drains in different locations. These were verified during field inspection.

- d) Stabilize the overburden dumps by appropriate grading/ benching so as to ensure that angles of repose at any given place is less than 28°.

Being complied. As reported, a scheme indicating method of stabilization of OB dumps by appropriate grading/benching has been prepared and approved by the RCCF, Angul and being implemented by the User Agency. This was observed during field inspection, but the angle of repose was more than 28° at some places.

- e) Strict adherence to the prescribed top soil management.

Complied. As reported, a scheme indicating top soil management has been prepared and approved by the RCCF, Angul with a financial outlay of Rs. 10.00 Lakhs. A total of 36,165 m³ of top soil has been generated during 2018-19 which has already been utilized partly in the dead part of the OB dump for plantation and the rest has been stacked separately within the lease area for future stabilization of the OB dumps.

- (v) The User Agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India.

Agreed to comply by the User agency.

- (vi) The user agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required.

Complied. EC has already been obtained vide letter No. J11015/407/2008-IA.II dated 20.07.2010 with a production capacity of 1.4 MTPA of Chrome Ore.

- (vii) State Government shall raise penal compensatory afforestation at the cost of the user agency, over degraded forest land five times in extent to the forest land utilized for non-forest purpose without obtaining requisite approval under the FC Act.

Complied. The user agency has reportedly paid the penal C.A. in the year 2015.

- (viii) The State Govt. and Integrated Regional Office, Bhubaneswar having jurisdiction over the forest land proposed to be diverted, shall ensure the compliance/direction of Hon'ble Court against the persons found guilty for violation of the Forest (Conservation) Act, 1980.

Agreed by the UA.

- (ix) The State Govt. and the user agency shall ensure land surrender schedule for surrender of the mined out and biologically reclaimed forest land as per approved mine plan and progressive mine closure plan. The biologically reclaimed forest land will also be surrendered to the State Forest Department as per approved schedule.

Complied. Modified Mining Plan along with progressive Mine Closure Plan has been approved by IBM vide letter No. RMP/A/30-ORI/BHU/2019-20/1613 dated 20.11.2019.

- (x) The State Govt. and the user agency shall implement approved site-specific Wildlife Management Plan at the project cost as per guidelines of the Chief wildlife Warden, Odisha.

As reported, the Site Specific Wildlife Conservation Plan has been approved by the PCCF (WL) and CWLW, Odisha with a financial outlay of Rs. 2,01,14,080/- out of which Rs. 10,00,000/- to be implemented by the User Agency and Rs. 1,91,14,080/- to be implemented by State Forest Department. The User Agency has already deposited the amount of Rs. 1,91,14,080/- towards the cost for implementation of Site Specific

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Wildlife Conservation Plan. The site specific conservation plan is approved in the year 2013.

It is reported that awareness creation and part fencing of the quarry area has so far been taken up by the user agency. The part fencing area of the quarry was visited during field inspection.

As reported by DFO Cuttack Division the following activity in the zone of influence has been undertaken during the year 2020-21.

Sl. No.	Item of works approved within the project impact area	Expenditure during 2020-21 (in Lakh rupees)
1.	Engagement of 10 WL Protection/Anti-depredation Squad for a period of 10 years.	8.70
2.	Awareness campaign, management of inter-face between man and elephant for anti-depredation measures	1.74
3.	Improvement to habitat from WL Management point of view in terms of ANR plantation over 20 ha.	6.14
4.	Creation of 1 No. of Water Harvesting Structure & cost of installation of a solar Power operated submersible pump.	16.00
5	a) Erection of 15 check dams	2.12
	b) Excavation of staggered trenches and gully plugging	-
6.	Creation and development of 5 Nos. of artificial salt licks with maintenance for 10 years.	0.36
7.	Development of pastures.	-
8.	Fire Management	1.35
9.	Incentive to 8 VSS and Cash award @ Rs.4, 000 per annum and supply of crackers etc. to the effected villagers on lump sum Rs.2,00,000.	0.52
10.	Provision of 1 multipurpose 3 storey watch tower.	10.00
11.	Cost of immunization of village cattle in the zone of influence.	0.50
12.	Provision for secret fund for the informers.	0.20
13.	Cost of free distribution of 2 year old saplings with fertilizers & pesticides.	
14.	Monitoring, evaluation, research and training including bio-diversity/bench mark study etc.	0.20
15.	Provision of compassionate grant payment.	-
	Total	47.83

- (xi) The State Govt. and the user agency shall ensure appropriate measures for creation of ponds and rain water harvesting structures, so as to ensure harvesting and storage of rain water and recharge of the groundwater.

Complied. As reported, two numbers of ponds have been constructed to store rain water and recharge ground water.

- (xii) The State Govt. and the user agency shall ensure approved plan for Afforestation of non-mineralized areas located within the mining lease at the cost of user agency.

Being complied. As reported, the South Kaliapani Chromite Mines of OMC comprises of 7 Chromite bands separated by thick Pyroxenite band and chert limonite strata. The ore bands dip sub-vertically. In order to extract Chromite from the deeper zone, lateral expansion of the pits is inevitable to maintain safety standards of opencast mining operation. As per the conceptual plan of Mining Plan approved by IBM, the non-mineralized virgin land is utilized for dumping of OB. This was observed during field inspection.

- (xiii) The user agency shall protect the top soil at the project cost.

Complied. As reported, a scheme indicating top soil management has been prepared and approved by the RCCF, Angul with a financial outlay of Rs. 10.00 Lakhs. A total of 36,165 m³ of top soil has been generated during 2018-19 which has already been utilized partly in the dead part of the OB dump for plantation and the rest of the top soil is stacked to be utilized for future stabilization of the OB dumps.

- (xiv) The State Govt. and user agency shall create and maintain alternate habitat/home for the avifauna, whose nesting trees are to be cleared in this project. Bird nests artificially made out of eco-friendly materials shall be used in the area, including forest area and human settlements, adjoining the forest area being diverted for the project.

Complied. As reported, a scheme of creation and maintain alternate habitat/ home for the avifauna, whose nesting trees are to be cleared, has been approved by the RCCF, Angul with a financial outlay of Rs. 49.89 Lakhs. The User Agency has set up bird nests artificially made out of eco-friendly materials in different part of the mine. It was observed

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during the field inspection that birds local to the area are using the birds' nests.

- (xv) Fencing, protection and regeneration of the safety zone area [7.5 meters strip all along the outer boundary of the mining lease area as recommended by the state govt.] shall be done at the project cost. Besides this afforestation on degraded forest land to be selected elsewhere measuring one & a half times the area under safety zone shall also be done at the project cost.

Being complied. As reported, a scheme for fencing, protection and regeneration of the safety zone area [7.5 meters strip all along the outer boundary of the mining lease area], has been approved by the RCCF, Angul with a financial outlay of Rs. 1, 29,000/-. Plantation has been carried out in Safety Zone area. The safety zone was visited during the site inspection.

It is noted that the project authorities have developed green belt in some areas and the percentage of survival of these plantations is good. It is also reported that 3500 number of plants have been planted in the safety zone. It has been observed that safety zone plantation has been done in most of the area. They have selected various plant species for plantation including native species viz. Gambhari, Neem, Teak, Panasa, Amla, Sissoo, Jamun, Karanja, Krushna chuda, Acacia, Chakunda, Chatian etc. It is also noted that the growth of native species are slower as compared to Acacia and Chakunda.

Safety zone of 2.790 ha was planted with mixed species comprising of *Erythrina suberosa* (Paldhua), *Mangifera indica* (Amba), *Artocarpus heterophyllus* (Panas), *Albizia lebbeck* (Sirisa), *Samanea saman* (Bada Chakunda), *Bombax ceiba* (Simili), *Dalbergia latifolia* (Pahadi Sissoo), *Alstonia scholaris* (Chatiana), *Delonix regia* (Krushna chuda), *Peltophorum ferrugineum* (Radha chuda), *Cassia siamea* (Sana chakunda), *Pistacia vera* (Pesta badam).

- (xvi) Period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease proposed to be granted under the Mines and Minerals (Development and Regulation) Act, 1957, and the Rules framed there under, subject to a maximum period of 20 years.

As reported, the Mining Lease period has been expended up to 21.01.2030 vide Govt. of Odisha, Steel & Mines Department order No. III(CR)SM-03/2015/2713/SM dated 04.04.2016. Supplementary lease deed has been executed on 12.08.2016.

- (xvii) State Govt. shall ensure gap planting and soil & moisture conservation activities to restock and rejuvenate the degraded open forests (having crown density less than 0.4), if any, located in the area within 100 meters from outer perimeter of the mining lease.

Complied. As reported, a scheme for undertaking gap plantation with soil & moisture conservation activities within 100 meters from the outer perimeter of the Mining Lease has been approved by the RCCF, Angul with an estimate cost of Rs. 8,36,000/-. Gap plantation has been reportedly taken up in the Mahagiri side of mining lease area.

- (xviii) State Govt. shall ensure de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks/water bodies, whenever required.

As reported, a scheme on de-silting of the village tanks and other water bodies located within five km from the mine lease boundary so as to mitigate the impact of siltation of such tanks /water bodies has been approved by the RCCF, Angul with a financial out lay of Rs. 84,55,234/-. The UA reported the following:

Sl. No.	Name of the Project	Year of Construction	Village	Status
1	Digging of Pond	2016-2017	Kaliapani	Completed
2	Digging of Pond	2016-2017	Panasia	Completed
3	Const. of Two Check Dams	2018-2019	Panasia Giringamali	Completed
4	Renovation of Check Dam	2018-2019	Kakudia	Completed
5	Const. of Check Dam	2018-2019	Giringamali	Completed
6	Const. of Check Dam	2018-2019	Giringamali	Completed
7	Renovation of Pond	2018-2019	Giringamali	Completed
8	Digging of 2 nos. of Pond	2018-2019	Garamian	Completed

Four (04) nos. of village ponds have been constructed, Four (04) nos. of check dams used for water storage have been constructed, one pond and one check dam have been renovated (Pictures are attached as **Annexure-I**).

- (xix) State Govt. and User Agency shall ensure mining in a phased manner and take due care for reclamation of the mined over area. The concurrent reclamation plan shall be executed by the User Agency as per the approved mining plan/ scheme and an annual report on implementation thereof shall be submitted to the Nodal Officer, Forest (Conservation) Act, 1980, Government of Odisha and the Addl. Principal Chief Conservator of Forests (Central), Ministry of Environment & Forests, Regional Office (Eastern Zone), Bhubaneswar. If it is found from the annual report that the activities indicated in the concurrent reclamation plan are not being executed by the user agency, the Nodal Officer or the Addl. Principal Chief Conservator of Forests (Central) may direct that the mining activities shall remain suspended till such time, such reclamation activities are satisfactorily executed.

Being complied. As reported, mining is being carried out in phased manner as per the approved mining plan by IBM. An annual report on implementation of concurrent reclamation plan has been submitted by the project authorities on dt 28.04.2020. This was observed during the field inspection.

- (xx) It shall be ensured that no labour camps are set up inside the forest area.

Complied. This was observed during the field inspection.

- (xxi) Any tree felling shall be done only when it is absolutely necessary and unavoidable.

Complied. Tree felling is being done only when it is necessary and unavoidable.

- (xxii) User agency shall provide firewood preferably alternate fuel to the labourers and the staff working at the site so as to avoid any damage and pressure on the adjacent forest areas.

Complied. As reported, free electricity is provided by the User Agency to the staff working at the site. Further, the labourers are coming from the nearby villages to the working site and they depend on gas connection available in the nearby market and therefore, no biotic pressure on adjoining forest areas. This was noted during field inspection.

Radhika Mehera

- (xxiii) The boundary of the diverted forest land, shall be demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, forward and back bearing and distance from pillar to pillar.

Complied. The boundary of the diverted forest land has been demarcated on ground at the project cost, by erecting four feet high reinforced cement concrete pillars, each inscribed with its serial number, forward and back bearing and distance from pillar to pillar. This was inspected during field inspection.

- (xxiv) The forest land shall not be used for any purpose other than that specified in the proposal and under no circumstances be transferred to any other agency, department or person.

Being complied. The forest land is being used for the purpose that specified in the proposal and not transferred to any other agency, department or person. This was noted during field inspection.

- (xxv) Any other condition that the Regional Office (Eastern Zone), Bhubaneswar may stipulate, from time to time, in the interest of conservation, protection and development of forests & wildlife.

No such conditions imposed by the Regional Office.

- (xxvi) The user agency shall submit the annual report on compliance to conditions stipulated in the approval conditions and also the condition stipulated in Stage-I clearance to the State Government and the concerned Regional Office of this Ministry.

Being complied. The User Agency has submitted the annual self-compliance report. The last report submitted by the project authorities was on 29.04.2021.

- (xxvii) The User Agency and the State Government shall ensure compliance to provisions of the all Acts, Rules, Regulations and Guidelines, for the time being in force, as applicable to the project.

Being complied.

Padma Mahanti

2. Comprehensive status of reclamation of mined-over/abandoned portions of the forest area as per approved mining plan:

STATUS OF OB DUMPS:

The current Chromite mine at South Kaliapani over 425.398 ha of forest land is operational and active.

- The South Kaliapani area consists of five sub parallel and sub-vertical Chromite bands. These are band no. I, II, III, IV and V (Regionally termed as band VI) occupying different stratigraphic levels. Out of all bands, Band-I,II & IV are being operated as fully mechanized Quarry-D and semi Mechanized quarry F. Band III is inconspicuous and Band-V is yet to be exposed by mining. The ore and overburden are extracted using HEMM and adopting bench method of mining.
- The details on production from the mine from the year 2017-18 up to 22.02.2021 are given below:

Sl.No.	Financial year	Production (in mt)
1	2017-18	755145.000
2	2018-19	1050513.00
3	2019-20	713526.00
4	2020-21 (up to 22.02.2021)	878247.00

- The amount of OB generated is being stored in the OB dumps created as per the approved land use pattern envisaged in the EMP. It is reported by the Project Authorities that the waste is partly nickeliferrous in nature. Those nickeliferrous waste is reported to be stored in the OB Dump-1 for future utilization.
- As informed, the total quantity of OB generated is 143390042 tons up to March, 2020 and 4185823.53 tonnes up to January, 2021. The slope stability study is being undertaken on regular basis by CMFRI, Dhanbad. During stabilization suitable native species are being selected for plantation to prevent soil erosion and surface run off. Check dams and boulder walls have been provided at the toe of the dump. The details of OB dumps as submitted by the project proponent is furnished below:

Dr. Arunima, Mahanta

Item	Length (Meter/Numbers)
OB DUMP	
RCC drain	1650 mtrs
RCC Vat	9 nos.
Creator Boulder wall (With GI create wire & Boulder)	885 mtrs
Earthen garland drain	13800 mtrs
Hume pipe (Road Crossing)	257.5 mtrs
UPVC (Dump Slope)	204 mtrs
BASE OF OB DUMP	
Creator Boulder wall	2000 mtrs
Garland Drain	2000 mtrs
Settling tank	19 Nos

(Photographs are enclosed as **Annexure-II**)

The total area earmarked for OB dumps as per Mining plan is 144.484 ha. Out of 144.484 ha, 139.57 ha is already utilised for dumping. There are two active dump sites:

1st active dump site is of 104.47 ha.

2nd active dump site is 35.10 ha.

Out of 104.47 ha of the 1st active dump site, 55.0 ha of the slope has been reclaimed. The remaining 49.47 ha of 1st active dump and 35.10 ha of 2nd active dump shall be reclaimed after it is declared dead. The height of the OB dump is approved by IBM to be 150 mtr from ground level and maximum up to 310 mRL. The existing dump height is at 122 meters. Terrace of 20 meters each has been maintained. The approval letter by IBM with relevant page is enclosed as **Annexure-III**. During conceptual plan both the dumps (Dump-1 & 2) shall reportedly be merged to a single dump for better stability and maintenance. The slope stability study is being conducted by CIMFR, Dhanbad. It is reported by the project authorities that the waste is of nickeliferrous nature and based on the % of nickeliferrous limonite, the OB dump-I is dumped with more than 0.5% nickeliferrous limonite waste and dump site-2 is dumped with less than 0.5% nickeliferrous waste. The lower reaches of the OB dump was planted with vetiver and lemon grass for bio-remediation of active Chromium 6⁺. The OB dumps had an angle of more than 28° at some places. This needs to be handled by the project authorities for ensuring safety and stability of the OB dumps.

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The lemon grass plantation by IMMT, Bhubaneswar as per their interim study report is capable of absorbing 98% of the Cr+6 from the dump. The speciation of Cr+6 is still under study by IMMT, Bhubaneswar.

The total 144.484 ha of OB dump area needs to be covered under plantation in a phased manner. In post mining phase entire OB dump needs to be covered under vegetative green cover to avoid leaching and seepage of water. Mined out area over Band-I (Quarry-D) shall reportedly be reclaimed up to 75 mRL & rehabilitated by plantation on the benches which will reduce the possibility of seepage of water from the weathered ultra basics occurring as overburden. Mined out Band II and IV (Quarry-F) shall be utilized as water reservoirs. Limonite being impermeable shall prevent leaching of storm water.

- Plantation has been raised in different years from 2012 onwards. Year-wise plantation as submitted by the user agency is detailed below:

Year wise details of plantation undertaken

Year	Lease hold area			Rate of Survival	Total nos. of trees survived	Amount spent in Rs.
	Location	Area (Ha)	No. of Species			
2012-13	Dump	1.00	2750	60% (App.)	1650	16500
2013-14	Dump	8.27	8600	80% (App.)	6880	86000
2014-15	Dump	3.50	7450	85% (App.)	6332	74500
2015-16	Dump	1.50	3130	85% (App.)	2660	31300
2016-17	Dump	1.35	3993	85% (App.)	4244	59895
	Safety Zone	0.22	1000			15000
2017-18	Dump	2.76	9200	90% (App.)	9180	138000
	Safety Zone		1000			15000
2018-19	Dump	8.50	19500	90% (App.)	18180	390000
	Safety Zone		500			10000
	Avenue Plantation		200			4000
2019-20 (by OFDC & IMMT)	Dump	22.464	33136	98%	32559	28179478
	Avenue					
	Dump (Vetiver and lemon grass)	1.00	6000	90%	5900	2607900
2020-21 (by OFDC & IMMT)	Dump	1.00	2500	100%	2500	3856243
	Safety zone	0.476	1000	100%	1000	
	Avenue	400	200	100%	200	

Padma Mahanti

		RKM				
2020-21 (by OFDC & IMMT)	Dump (Vetiver, Lemon & Palmarosa grass)	3.30	8000	100%	8000	1707800
	Dump (tree)		9000	88% (App.)	8000	
Total		55.52	117159		107285	37191616

The slopes of the dump sites were dominated with *Trema orientalis*, which was coming up naturally covering the entire slope in some regions of the dump. The other tiers towards the top had good vegetative growth. It was a plantation of mixed species.

The top of the dump provided a birds view of the entire mine area.

It has mixed plantation of *Bombax ceiba* (Simili), *Albizia lebbeck* (Sirisa), *Peltophorum ferrugineum* (Radha chuda), *Mangifera indica* (Amba), *Artocarpus heterophyllus* (Panas). This plantation was raised by OFDC in the year 2012-13.

Though it was informed by the user agency that the survival rate is 98%, the canopy had still not closed and growth was not prolific on top of the Dump site. This area was informed to be biodiversity rich with avifauna & butterflies.

- It was observed that at many places the OB was being dumped for storage.
- It was also observed that at many places on the OB dumps, *gully* formation has occurred due to flow of water. It is viewed that the project authorities may look into this aspect to check such flow of water as well as prevent land slide in the area. The OB dumps had an angle of repose more than 28 degrees at some places. This aspect needs to be looked into by the project authorities for ensuring the safety and stability of the OB dumps.

The higher benches of excavated void/mining pit are not yet stabilized with plantation since the quarry is active. It was admitted by OMC for necessary compliance at the end of the mining activity.

- It has been found that PAs have constructed the garland drains, settling tanks and check dams of appropriate size, gradient and length in few areas of the over burden and mine pit area only. They

have constructed the sump and few sedimentation pits for controlling of the surface runoff etc., which is well connected with the ETP. Overall, the catch drain and siltation pond is properly managed by the PAs.

- It is observed that the project authorities have constructed retaining wall at the toe of the over burden dumps. However, it is noted that at some places, there is gully formation over the OB dumps due to its steep and resulting in the deposition of soil in the garland drains.
- The project authorities need to take up works for cleaning of the garland drains, stabilizing the retaining wall and also take necessary steps for proper terracing the OB dumps and checking the gully formation resulting in soil erosion.
- It is observed that the project authorities are raising plantations through OFDC. The project authorities have also consulted Scientists from CSIR Laboratory, IMMT Bhubaneswar for raising plantations over OB dumps and its stabilization.

The average Nickel content of OB dump is within 0.5%. The extraction of Nickel as per the pilot study by IMMT, Bhubaneswar is not economically viable. The process is a wet process which will generate huge quantity of sludge and again storing will have the same problem.

OMC has awarded the work on Phytoremediation of Cr⁶⁺ from OB dump at South-Kaliapani Chromite mines to Institute of Minerals & Materials Technology (IMMT), Bhubaneswar. The soil analysis report given by CSIR-IMMT before plantation is given as under:

Soil analysis Parameters	Overburden soil, COBP Haul road, OMC
pH	6.10± 0.3
EC (dS/m)	0.28± 0.35
Soil Organic carbon (%)	0.850
Water Holding Capacity (%)	39.56
Total nitrogen (%)	0.056
Available nitrogen (ppm)	0.26
Total Phosphorus (%)	2.5
Fe (ppm)	10.98

Radhika Mahanta

Cu (ppm)	0.318
Cr (ppm)	1.853
Cr⁶⁺ (ppm)	1.1-1.25
Co (ppm)	4.712
Cd (ppm)	0.0037
Pb (ppm)	0.104
Zn (ppm)	1.250

Availability and movement of chromium, nickel and other available metal in the substrata in root, shoot and fruits part of the plants requires further study.

Plant which are having lowest translocation factor can be preferred under afforestation on the OB and plant which have high translocation factor may be avoided.

The translocation factor represents the plant's ability to translocate the pollutant from the roots to the aerial parts of the plant. It is calculated as the ratio of the concentration of the pollutant in the aerial parts of the plant to the root concentration. These factors are utilized to help identify new potential hyper-accumulator species. The species like Cassia siamea and Azadirachta indica with low translocation factor is being planted mainly in the OB dump area of South-Kaliapani Chromite Mines of OMC Ltd.

ETP:

- It has been observed that the project has two numbers of ETP of capacities 1200 KL and 300 KL. The ETPs have been designed by IIT, Kharagpur and the detailed engineering work was carried out by M/s MECON, Ranchi. The workshop effluent is routed through oil and grease separator and the collected water is being used for automatic vehicle washing system. There are two active mining pits namely D- Quarry and F- Quarry. The water pumped from the D Quarry is discharged to Damsalanala near Kaliapani after treating in the Effluent Treatment Plant (D- Quarry ETP) and the mine water pumped from F-Quarry is discharged to Damsalanala near Gurujangpal School after treating in the Effluent Treatment Plant (F-Quarry ETP). It has been informed that mine water discharge is being treated in ETP for hexavalent chromium and the outlet of ETP conforms to the prescribed standard of Central Pollution Control Board (CPCB). Reportedly, the latest third party analysis of ETP outlet was conducted by M/s Center for Envotech and Management Consultancy

Pvt. Ltd. which is NABL and MoEF&CC recognized laboratory. As per the analysis reports, all parameters are found within the permissible limits.

- Reportedly, effluents containing Cr^{+6} are being treated to meet the prescribed standards before reuse/discharge. Effluent Treatment Plant has been provided for treatment of mine water discharge and wastewater generated from the workshop and minerals separation plant.
- It has been observed that PAs have setup Effluent Treatment Plant (ETP) to treat the mine water discharge and further the treated effluent is being reused for various dust suppression measures. The outlet of ETP conforms to the prescribed standard. The effluent of Chrome Ore Beneficiation Plant (COB) is not in operation. The workshop effluent is routed through oil and grease separation pit and the collected water are reused for vehicle washing.

In order to avoid pollution of Nala following measures has been reportedly undertaken by PA.

- No water is being reportedly discharged outside the mine premises without treatment.
- Regular monitoring of water quality is being done.
- Catch drains and siltation ponds of appropriate size have been constructed of appropriate size, gradient and length to prevent runoff of water and flow of sediments directly into Damsal Nallah, Talangi Nallah and other water bodies.
- The supernatant water collected from the settling tank is reused for dust suppression purpose.

The quarry water is utilised for sprinkling purpose to suppress dust on the haulage road. This was observed during field inspection, the quarry water is also utilised for beneficiation of low grade Chromite ore. The tailing pond approved over 20.0 ha has been planned with HDPE lining before tailing is discharged from the COB plant. This will prevent leaching of contaminated water. It needs to be installed at an early date.

Additional Mitigative measures:

1. To avoid planting of fruit trees during biological stabilisation of OB dump sites.

Radhika N. N. N.

2. Plants which have lowest translocation factor may be preferred for biological stabilization of OB dumps and plants with high translocation factor may be avoided.
3. Pollution of nala's need to be controlled. Discharge of mine effluents in the nala without proper treatment increases Cr+6 at some stretches of the Nala, water from these drains can be utilised for beneficiation of low-grade chrome ore after closure of the mine.
4. Tailing pond has not been constructed so far. It needs to be constructed.
5. Leaching of overburden and weathered ultra basics in mine seepage water shall add hexavalent chromium (Cr+6) in the water Reservoirs. Cr+6 is carcinogenic beyond permissible limit (0.05 mg/l). It is reported that there is no accumulation of quarry seepage in the bottom of the mined pit. The seepage is pumped to ETP for treatment and discharge to the natural water course. This needs to be maintained till the close of the mining activity.
6. More R&D for bio-remediation of Cr+6. This needs to be carried out.
7. Post mine closure monitoring of ground as well as surface water is utmost desired.
8. Pipe water supply in the neighbouring areas under CSR/CER be ensured in place of hand pumps (As reported is being complied so far).

Compensatory Afforestation:

The requirement of CA land against South Kaliapani Chromite mines was 276.556 ha which has been identified in Dhenkanal and Kalahandi district as detailed below:

1. The financial outlay for compensatory afforestation over 272.076 ha of non-forest Govt. land in village Pangatira of Kankadahada Tahasil of Dhenkanal district under Dhenkanal Forest Division has been technically approved for Rs 2.85,82,360/-. The UA has deposited the said amount and the State Forest Department has undertaken ANR with gap plantation during the period 2017-18 to 2020-21 and completed. As reported, 54415 nos. of saplings have been planted with 70% survival rate. The Geo-tag photographs of the CA area at Pangatira are attached herewith as

Annexure-IV.

2. The balance 4.48 ha of non-forest land in village Balangi of Thuamul Rampur Tahasil of Kalahandi district under Kalahandi South Forest Division was taken up for CA with a financial out lay of Rs 16,91,800/-. It is reported that the gap plantation work in ANR mode was commenced

during 2019-20 with planting of 1792 nos. of seedlings at the rate of 400 plants per hectare and completed. The Geo-tag photographs of the CA area at Balangi are attached herewith as Annexure-V.

CONCLUSION:

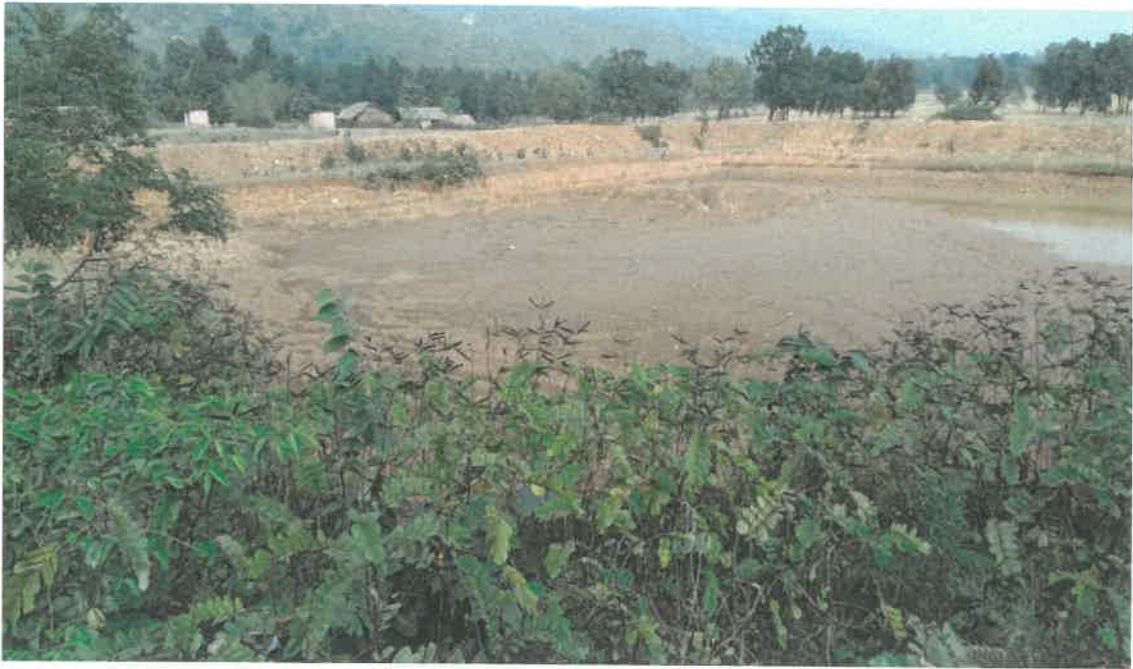
- The safety zone and nallah bank are being restored by plantation as prescribed in the approved mining plan.
- Soil and water conservation measures are implemented by construction of dry stone masonry check dams, siltation ponds, garland drains, settling ponds, retaining wall, stabilization of OB dump.
- Prevention of fall of wild animal into the mining pit by fencing the open pit area is ensured by part fencing with passage for movement of vehicles.
- The conservation measures for protection of flora and fauna in the buffer zone is being taken care by the State Forest department by utilizing the funds of Rs.1,91,14,080.00 (Through RTGS mode vide UTR ANDBH-14022232398 dt.22.01.2014) deposited by OMC towards the approved activities to taken up by the DFO, Cuttack Division.
- It was also observed that at many places on the OB dumps, gully formation has occurred due to flow of water. It is viewed that the project authorities may look into this aspect to check such flow of water as well as prevent any large scale land slide in the area. The OB dumps had an angle of repose more than 28 degrees at few places. This aspect needs to be looked into by the project authorities for ensuring the safety and stability of the OB dumps.
- The project authorities need to take up works for cleaning of the garland drains, stabilizing the retaining wall and also take necessary steps for proper terracing the OB dumps and checking the gully formation resulting in soil erosion. It is requested to maintain it on regular basis.
- The project may contemplate on various methods for reduction of Cr⁺⁶ in the tailing pond, as and when it is installed, in consultation with organizations/institutes of national repute.

• Padma Mahanti

- At some places it is noted that the plantations have been denuded due to grazing or cutting by the people. Re-plantation with new saplings may be carried out.
- The percentage of plantation is good in some areas. The average survival rate is reported be more than 90%.
- Restocking of the top of the 55.0 ha of the OB dump with tall seedlings plantations, with the support of the State Forest Department, Cuttack Division as discussed with the ACF, Shri Sarat Kumar Sahoo, OMC officials during field inspection needs to be taken up urgently and to be monitored.
- The active dump site of 89.484 ha (49.47 ha of 1st dump + 35.10 ha of 2nd dump + Fresh area of 4.914 ha) reportedly will continue for approximately 2-3 years after which it needs to be reclaimed with intensive planting and use of geotextiles. The plant species so chosen needs to be of native species, non-fruit bearing with low translocation factor.
- It is reported by the Project authorities that de-silting of the check dam is being done in the post monsoon season and the ponds will be desilted as and when it is filled with silt.
- Vetiver grass is planted in the lower reaches of the dump to bind the soil cover to prevent erosion and give better stability to the dump. This needs to be replicated in the other part of the Dump, once the active Dumps are ready for stabilization. Vetivers can be commercially exploited which will help the locals in economic upliftment. CIMAP (Central Institute of Medicinal and Aromatic Plants), Lucknow is a research Institute of CSIR, has developed technique for oil extraction from vetiver grass with least investment. The user agency can facilitate to provide the tools and technology from CIMAP near the vetiver site for local stakeholder.

Padma Mahanti
(PADMA MAHANTI)
DIGF (CENTRAL)

DESILTING OF VILLAGE PONDS AND CONSTRUCTION OF NEW POND



DIGGING OF POND AT PANASIA KANKADPAL



DIGGING OF POND AT RAGADA PANASIA



CHECK DAM AT KAKUDIA, RANSOL GP



RENOVATION OF POND AT DEHURISAH, KALIAPANI



CONCRETE DRAIN AND CREATOR BOULDER WALL AT BASE OF OB DUMP



CONCRETE DRAIN FROM TOP TO BOTTOM OF THE OB DUMP



ROAD CROSSING WITH HUME PIPE AND COLLECTION CHAMBER

Radina Mahanti



PIPE LINE ARRANGEMENT WITH VAT AT THE SLOPE OF THE DUMP



GARLAND DRAIN AND CREATOR BOULDER WALL AT BASE OF OB DUMP



CONCRETE DRAIN AND CREATOR BOULDER WALL AT BASE OF OB DUMP

Rajeev Mahesh



CREATOR BOULDER WALL DRAIN AT OB DUMP



EARTHEN GARLAND DRAIN AT DUMP



EARTHEN GARLAND DRAIN AT DUMP

Padma Yashanti



CREATOR BOULDER WALL AT OB DUMP



CREATOR BOULDER WALL DRAIN AT OB DUMP



CREATOR BOULDER WALL DRAIN AT OB DUMP

Padme Mahanta



PIPE LINE ARRANGEMENT WITH VAT AT THE SLOPE OF THE DUMP



ROAD CROSSING WITH HUME PIPE AND COLLECTION CHAMBER

Radwa M. Hant



भारत सरकार GOVERNMENT OF INDIA
खान मंत्रालय MINISTRY OF MINES
भारतीय खान ब्यूरो INDIAN BUREAU OF MINES
क्षेत्रीय खान नियंत्रक के कार्यालय
OFFICE OF THE REGIONAL CONTROLLER OF MINES



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eMail:
ro.bhubaneshwar@ibm.gov.in
Plot No.149, Pokhariput
BHUBANESWAR-751020

No. RMP/A/30-ORI/BHU/2019-20/1613

Date: 20/11/2019

To

Shri R Vineel Krishna, IAS,
Managing Director & Nominated
Owner, M/s OMC Limited,
OMC House, Bhubaneswar,
Odisha – 751001.

Sub: Approval of Review of Mining Plan of South Kaliapani Chromite Mine over an area of 552.457 ha in Jajpur district of Odisha of M/s OMC Limited submitted under Rule-17 (2) of MCR, 2016.

- Ref: -i) Your letter no. 15504/OMC/PMC/19 dated 30.09.2019 received on 09.10.2019.
ii) This office letter of even no. dated 09.10.2019.
iii) This office letter of even no. dated 09.10.2019 addressed to the Director of Mines, Govt. of Odisha, copy endorsed to you.
iv) This office letter of even no. dated 24.10.2019.
v) Your letter no. 17393/OMC/PMC/19 dated 07.11.2019.
vi) Your letter no. 17579/OMC/PMC/19 dated 11.11.2019.

Sir,

In exercise of the power delegated to me vide Gazette Notification No. S.O. 1857 (E) dated 18.05.2016, I hereby Approve the Review of Mining Plan including Progressive Mine Closure Plan of South Kaliapani Chromite Mine over an area of 552.457 ha of M/s OMC Limited in Jajpur district of Odisha State submitted under Rule 17 (2) of Mineral Concession Rules, 2016. This approval is subject to the following conditions:

- I. The Review of 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 Review of 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, 2016 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.

Contd. Page-2

- 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 this approval conflicts with any other law or court order / direction under any statute, it shall be revoked immediately.
- VII. Validity of this document shall expire on 31.03.2025.
- VIII. Next financial assurance shall be due for submission on 31.03.2025.

Encl: - One copy of approved
Review of Mining Plan

भवदीय / yours faithfully,


(HARKESH MEENA)

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

Copy for kind information to:-

1. 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 Review of Mining Plan by **REGISTERED PARCEL**.
2. Shri A. K. Samantray and Shri Subrat Kumar Behera, Qualified Person, M/s Odisha Mining Corporation Limited, OMC House, Post Box No.34, Bhubaneswar-751001, Odisha.

(HARKESH MEENA)

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines



South Kaliapani Chromite Mine
Odisha Mining Corporation Ltd

Review of Mining Plan including Progressive
Closure Plan from 2020 to 2025



Reclamation and Rehabilitation:

During this Plan period, the present opencast mining in Band I shall reach its ultimate limit but opencast mining in Band II shall continue beyond proposed plan period. Thereafter vertical mining using grab is proposed to be done to mine out ore below ultimate pit limits. Amalgamation of adjacent mining leases of same lessee will further create scope for deepening of quarry. So opencast mining in Quarry D shall continue for few more years beyond proposed plan period. Once, opencast activities in Quarry D is completed, the mine void shall be backfilled up to certain height with overburden being generated from Quarry F or re-handling of overburden dump. Remaining void shall be used as water reservoir. Quarry F shall continue for few more years beyond proposed plan period. Amalgamation of adjacent mining leases of same lessee, vertical mining using grab, re-handling of tailing dam etc shall further create scope for quarry deepening thus increasing mine life. Once, opencast activities in Quarry F is completed, the mine void shall be backfilled up to certain height with re-handling of overburden dump. Remaining void shall be used as water reservoir.

Land Use Pattern: The land use pattern at the end of conceptual period on the basis of current level of exploration data is given below.

Sl No	Heads	Area, (Ha.)		
		Existing land use (as on 30.06.2019)	Land use at the end of Review of Mining Plan	Conceptual Land Use
1	Area under Mining	135.785	227.742	255.273
2	Overburden Dump	120.751	144.484	144.484
3	Mineral storage & Sub grade ore storage	21.873	55.385	47.450
4	Infrastructure (Workshop, Admn. Building ETP, COBP etc)	10.259	34.1041	40.099
5	Roads	12.082	27.252	27.252
6	Tailing pond	Nil	20.000	20.000
7	Safety Zone	(5.578) *	(5.578) *	5.578
8	Untouched tenant land	(6.516) *	(6.516) *	6.516
		300.750	508.9671	552.457

Note: Excluding * as shown in the above table.

In order to mine friable ore below UPL of Band I up to the extent possible, necessary scientific study for vertical mining by grab will be carried out. Also, feasibility studies for underground mining in Band I is under progress. Based on the findings, necessary step shall be taken for implementation of same.

The existing and proposed Chrome Ore Beneficiation Plant (COBP) will be in operational state till end of life of mine. The proposed tailing pond is an integral extension of COBP. The Conceptual Plan has been prepared on the basis of present level of ore body of Band IV. Same would be revised with deeper level of exploration of Band IV and subsequently re-handling of tailing will be proposed in future proposals, with modification of conceptual plan.

Subrat Kumar Behera
Qualified Person

A K Samantray
Qualified Person



DISHA

South Kaliapani Chromite Mine
Odisha Mining Corporation Ltd

Review of Mining Plan including Progressive Mining
Closure Plan from 2020-21 to 2024-25



Waste Disposal: The waste generated during the course of mining operations will be stacked over the existing dumpyard. All the lodes continue to exist almost vertically at deeper levels. The ultimate pit at band No. 1 & 2 has been designed at -50mRL and for band IV at 58mRL. The selection of the dump site for external dumping is on the basis of following criteria.

- All dump sites have been located outside the mineralized zone beyond ultimate pit limits.
- Topography features have been taken into account, particularly in the context of water drainage.

It has been calculated that approximately 827 Lakh CuM of overburden will be generated during the course of opencast mining in Band I, II & IV beyond 30.06.2019 till end of conceptual period. The existing dump is having a balance capacity of 535 Lakh CuM as on 30.06.2019. Out of 827 Lakh CuM of overburden to be generated, approx. 535 Lakh CuM will be dumped over the existing dump yard. During the proposed mine plan period all overburden will be dumped over the existing dump yard. In order to cater the dumping requirement of overburden, lessee has obtained necessary "no objection" from Steel & Mines Dept, Govt of Odisha for requirement of land outside ML area for dumping of overburden generated from South Kaliapani and Sukurangi Chromite Mines. Refer Annexure 25. MoEF&CC has also accorded stage I clearance for diversion of 168.948 Ha. of forest land adjacent to South Kaliapani Chromite mine of OMC for dumping of overburden of South Kaliapani Chromite mine and Sukurangi Chromite mine of OMC Ltd. Refer Annexure 25. After obtaining all required statutory permissions, lessee shall utilize the adjoining land for dumping of balance 292 Lakh CuM of overburden.

The height & width of individual terrace of overburden will be 20 m with bank slope angle of 37° of individual lift for a total number of 7 lifts. The maximum height of overburden dump is planned to be 150 mtrs from ground level and maximum upto 310mRL. CIMFR has been entrusted to study the dump design for 150mtrs and prima facie the proposed dump is stable and safe. The draft report of CIMFR is attached as Annexure 27.

The dumps will be compacted and afforested on the terraces as well as along the slopes after spreading a layer of top soil over it before rehabilitation. The location of these dumps is marked on conceptual plan. Progressive afforestation is proposed to be carried out over the dumps as and when the dead end is reached and settled. Dumps will be afforested to check against wash off and guarded with retaining walls at their toes along the lower contours. Following the retaining wall a garland drain will be developed for carrying water to the natural drainage system through settling tanks & ultimately leading into the natural drainage pattern of the area. All the waste dumps will be rehabilitated on conceptual period by adequate plantation along the slopes as well as terraces so as to avoid any wash off.

Top Soil: There will be generation of top soil from the freshly broken area which will be utilized for concurrent afforestation over the dumps & for avenue plantation.

Environmental Monitoring: Noise, air, water and other environmental parameters will be measured periodically to have a close monitoring of the environmental condition. Spraying of water on haul roads, dust arrester on drills, prevention of ground vibration by utilization of optimal quantity of explosive per delay, plantation along road and other areas will be taken up. At the end of conceptual period the area will have mined out voids surrounded from all the sides by plantation, afforested dumps and avenue plantation.

Subrat Kumar Behera
Qualified Person

A K Samantray
Qualified Person



Lat 21.137542° Long 85.346405°
25/08/21 11:11 AM



Lat 21.137454° Long 85.346321°
25/08/21 11:10 AM



Lat 21.137545° Long 85.346398°
25/08/21 11:11 AM



Lat 21.137502° Long 85.346329°
25/08/21 11:10 AM



Lat 21.137431° Long 85.346321°
25/08/21 11:10 AM

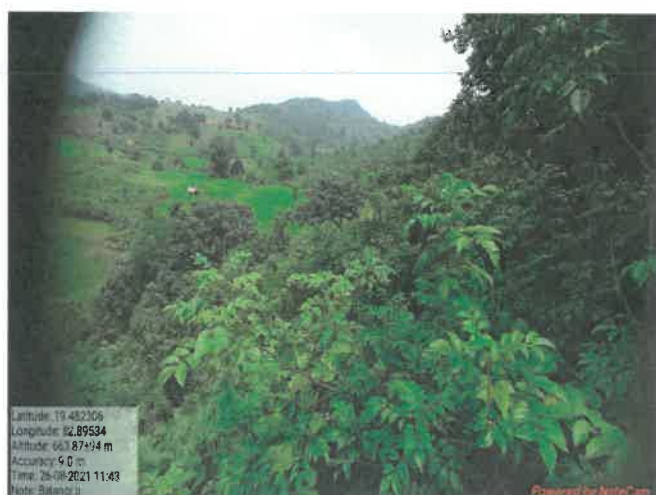


Lat 21.137481° Long 85.346356°
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South Kaliapani OB Dump Site



With the Forest Department Officials and Project authorities on the top of the OB Dump