



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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No. MS/FM/25-ORI/BHU/2017-18

Date: 23.10.2017

To

Smt. Indrani Patnaik, Mine Owner,
Village- Unchabali, PO-Bamebari,
Barbil, Dist- Keonjhar,
Odisha-758034

Sub: Approval of Review of Mining Plan of Unchabali Iron & Mn Mine along with Progressive Mine Closure Plan (PMCP), over an area of 106.1127 ha in Keonjhar district of Odisha State, submitted by Smt. Indrani Patnaik under Rule 17 of MCR, 2016.

Ref: - i) Your letter No. Nil dated 04.10.2017.
ii) This office letter of even no. dated 04.10.2017.
iii) This office letter of even no. dated 04.10.2017 addressed to Director of Mines, Government of Odisha copy endorsed to you.

Sir,

This has reference to the letter cited above on the subject. The draft Review of Mining Plan along with Progressive Mine Closure Plan (PMCP) has been examined in this office based on earlier site inspection dated 11.07.2017 by undersigned and Shri S R Mazumdar, Senior Mining Geologist. The deficiencies observed are enclosed herewith as Annexure I.

You are advised to carry out the necessary modifications in the draft Review of Mining Plan in the light of the contents vide Annexure 1 and submit **three (3) firm bound and two (2) soft copies of the document text in CD in a single MS Word file (the drawing/plates should be submitted in Auto CAD compatible format or JPG format in resolution of 100x100 pixels on same CD)** with financial assurance under Rule 27 of MCDR 2017 of the Review of Mining Plan within **15 (Fifteen)** days from the date of issue of this letter, for further necessary action. If the total page of annexures exceeds 50 (Fifty) then it should be submitted as separate volume. But reference of these annexures must appear in the Review of Mining Plan document. The plates are also to be submitted in separate volume.

The para-wise clarifications and the manner in which the deficiencies are attended should invariably be given while forwarding the final copies of the Review of Mining Plan. It may be noted that no extension of time in this regard will be entertained and the Review of Mining Plan will be considered for rejection if not submitted within above due date. It may also be noted that if the deficiencies are not attended completely, the submission would be liable for rejection without further correspondence.

Yours faithfully,

(HARKESH MEENA)

Regional controller of Mines

Scrutiny comment on Review of Mining Plan with PMCP in respect of Unchabali Iron & Manganese Mines over 106.1127 Ha of Smt. Indrani Patnaik in Keonjhar district of Odisha State.

1. GENERAL:

- I. The e-mail, phone & fax no. of lessee may be furnished on cover page.
- II. Photo Identity Card of Lessee may be furnished along with permanent address proof.
- III. Copy of Power of Attorney in favor of Shri Dipti Ranjan Patnaik may be enclosed as annexure.
- IV. In the text part, the "Mineral Conservation and Development Rules 1988" to be replaced with "Mineral Conservation and Development Rules 2017" in the content of different parts. The reference quoted at MCDR 1988 may be replaced with relevant rules under MCDR, 2017.
- V. In page no.7, para 3.1, the period of review of mining plan may be rectified. It may be mentioned for the financial year 2018-19 to 2022-23. The same should be rectified in all places of the text document.
- VI. The content page showing "List of Annexures" may also be enclosed in Annexure document.
- VII. The content page showing "List of Plates" may also be enclosed in plate document.
- VIII. All the annexure to be properly indexed/ numbered/ paged and signed by qualified person. All the certificates should bear dated signature.
- IX. Certificate in support of Experience in favor of Shri. A. Gurubalasubramaniam, Qualified Person and Educational Qualification Certificate of Shri Pradeept Mohapatra, Qualified person may be enclosed as annexure.

2. GEOLOGY AND EXPLORATION:

- I. In page 20, the information on the strike of the formations has been repeated and the same should be rectified with correct information.
- II. In the table provided in page 22, apart from existing information additional information regarding BH nos, Depth range (max-min), and inclination in each phase of drilling may be provided.
- III. In page no. 22, it has been mentioned that resources has been estimated by considering 79 Nos. of boreholes. Justification may be provided why only 79 boreholes have been considered for estimation while 133 nos. of boreholes have been drilled within lease area. The detail of the 79 boreholes used for resource estimation such as BH Nos, year of drilling, type of drill (Core/DTH/RC) may be provided in tabulated format.
- IV. In page no.23, para iv, the expenditure incurred under different heads of exploration may be provided in tabular format.
- V. In page no.23 it has been mentioned that samples have been analyzed at Cotecna Inspection (India) pvt. Ltd, a NABL Accredited agency. Information on number of samples analyzed from NABL accredited laboratory may be given in tabulated format.
- VI. In Page 24, para h, the trend of the strike direction does not match with the trend of strike direction provided in page 20. The trend of strike direction should be rechecked and rectify in both the pages, page no 20 & 24.
- VII. In page no. 24, it has been mentioned that total area has been explored under G1 level of exploration. The lease area explored under different limit of UNFC may be reassessed based on the borehole spacing for iron ore as per MEMC rules 2015 and lateral influence. Accordingly, both the tables in page no. 28 may be modified. The lease area explored as per UNFC

norms and geological resources estimated under different limit of UNFC may be reassessed and furnished.

- VIII. In page no. 25, the statement "safe side the bulk density of iron ore considered as 3.50 MT/m³ " may be deleted. The resources and reserves of iron ore may be re-estimated based on bulk density of 3.62 g/cc as per CIMFR enclosed as annexure XII and all the changes in calculations may be done accordingly both in text and in relevant annexures (ref. Annexure XIV).
- IX. In page no. 27, under "Depletion of Reserves", the financial year may be corrected i.e., "2014-15" may be replaced with "2015-16" & the period 01.04.2015-31.03.2016 may also be corrected.
- X. The information provided for number of boreholes considered for resource estimation varies from page to page. Refer page no. 22, 28 etc. The same should be rectified in all the relevant pages.
- XI. The details like potentially mineralized area and its extent (UTM coordinate), potentially mineralized area explored (in forest and non-forest area, Govt. land, Pvt. land etc.), remaining area, proposal of exploration to explore remaining potentially mineralized area to be given with justification of adequacy may be provided in tabulated format.
- XII. The Form K of all the boreholes drilled till date to be submitted. For example the Form K for BH 3/16, BH 4/16, BH 6/16 etc. is not annexed with the document. To be rechecked for all the boreholes and submit.
- XIII. In page 24, the future exploration program may be modified. Additional core boreholes to be proposed where the existing boreholes have been terminated in ore zone, to ascertain the lateral extension and depth continuity of the ore zone along the section line and to explore lease area under G1/G2 limit of UNFC.

Proposed tentative boreholes location along section lines	
Section Line	Future Exploration Program.
AA'	Core borehole may be proposed at 337020 E along the section line AA'
BB'	Bh No. 16/09 terminated on ore zone has not been shown in the section no.BB'. A core borehole may be proposed along the section line BB' in between 337100E to 337200E to prove the depth continuity of ore zone
CC'	Core boreholes may be proposed at 337050 E & 337140 E along the section line CC'.
DD'	Core boreholes may be proposed at 337600 E & 337800 E along the section line DD'
EE'	Core borehole may be proposed at 337200 E along the section line EE'. All the lithology shown in the section has not been indicated in the index for Geological feature.
FF'	Core boreholes may be proposed at 337150 E, 337300 E, & 337400 E along the section line FF'
GG'	Core borehole may be proposed at 337150 E. Also, borehole may be proposed at 338000 E.
HH'	Borehole may be proposed at 337800 E along the section line GG'
II'	Borehole may be proposed at 338000 E along the section line II'
JJ'	Boreholes may be proposed at 336900 E & 338000 E along the section line JJ'
KK'	Core borehole may be proposed at 337150 E, 337900 E & 338000 E along the section line KK'

XIV. The depth of the proposed boreholes should be adequate enough to justify the lateral and depth extension of the ore zone along and across

the section lines up to the end of mineralization considering the geology and nature of ore deposit.

- XV. The year wise drilling proposal may be shown in tabulated format. The year wise borehole proposal should be shown in Geological Plan. The proposed boreholes to be plotted in dotted lines in Geological sections along with Collar Id, RL and proposed closing depth at the bottom of the borehole.
- XVI. As per guideline of "IBM manual on appraisal of Mining Plan 2014" at least 10% of total samples to be analyzed in accordance to BIS and reports form NABL accredited/Government Laboratory. Accordingly, the proposal should be given under future exploration programme.
- XVII. In page 25, 30, 39, 70 etc, the header of the table showing recovery factor (%) and bulk density may be modified. Instead +58% Fe may be indicated as Ore; +45-58% as Mineral Reject and -45% Fe as Waste. The title such as "Ore Zone of Subgrade Iron ore" between (45-50% Fe), (50-55% Fe) and (55-58% Fe) wherever it is mentioned either in text or in related annexures maybe replaced with "Mineral Reject" Also, adequate justification maybe provided for considering the recovery (%) in different Fe zone in Mineral Reject such as (45-50% Fe), (50-55% Fe) and (55-58% Fe) as furnished in the table.
- XVIII. In page 30, the quantity of material between 45% Fe to 58% Fe and above 58% Fe may be shown under different UNFC code.

3.0 MINING:

- I. All the calculations done for arriving at year wise tonnage proposed in the review of mining plan period (2018-19 to 2022-23) may be made on the bulk density and recovery factor determined for Iron ore and Mineral Rejects/ subgrade through the test reports (ref. Annexure -XII & XIII).

- II. In page no. 39 para II (Insitu Tentative Excavation), the year wise tonnage of "Total ROM" proposed should not exceed the EC limit of 4.0 MTPA as there is no proposal for increase in production. Accordingly, the figures shown in the table and in related annexures may be rectified.
- III. In page no. 39 para II (Dump Re-handling), the process of re-handling the subgrade dump-1 for recovery of mineral rejects may be elaborated along with handling of waste thus generated from re-handling. Also, the figures pertaining to year wise handling (cum) may be shown along with corresponding year in separate columns. Both the table pertaining to dump re-handling in page no.39 & 40 may be rectified accordingly.
- IV. In the year wise Excavation Proposal from page no. 40 to 45, the Top Bench RL, Bottom Bench RL and Number of Benches proposed for working in the Quarry at the end of each year may be shown in the Quarry Development part. Also, the Production of ROM (Ore + Mineral Rejects) shown in tables from page no. 41 to 45, should not exceed the EC limit of 4.0 MTPA. Accordingly, the year wise excavation proposals may be rectified in text and in related annexures.
- V. In page no.47, the table showing "Layout of faces" should also have information on Top Bench RL, Bottom Bench RL and No of Benches. The table may be modified accordingly.
- VI. The Geological log sheet of the BH. No 21/15 (ref Plate No. III, Surface Plan) over OB Dump bounded between coordinates 2419300 N to 2419400 N & 336900 E to 337000 E shows 8.0 m of ore zone analyzing more than 60% Fe and further 4.0 m of mineral reject. Justification may be submitted for OB dumping proposal over the same.

- VII. An additional table may be shown showing the year wise generation of waste (in metric ton) apart from the information provided (in cum) in page no. 56.
- VIII. Before backfilling of the quarry as proposed it should be ensured the exhaustion of ore body in terms of their depth & extension in the interest of mineral conservation.
- IX. Back filling proposal has not been explained properly. Exhausted area to be backfilled by OB/Waste to be specified with mRL and area on year to year basis with description of the method & manner of disposal of waste. The Floor RL and Top RL proposed for the year 2020-21 to be rechecked and rectified. The year wise area limit of boundary coordinates for backfilling may be included in the same table in separate column for the plan period and also for the conceptual period.

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

- i) All existing Sub-grade dumps and waste dumps may describe with its location along with mRL in text. The top mRL of all above to be depicted clearly on plans.
- ii) Location of sub-grade storage along with year to year development of the SG dumps to be given.
- iii) Details Existing and proposed retaining wall, garland drain, settling tank etc. to be given with their location.

5.0 Chapter- "Other":

- i) Existing manpower both direct and contractual has to be mentioned in the text.

- ii) An organizational chart has to be provided for risk assessment study to whom communication to be made in case of any accident.

6.0 PROGRESSIVE MINE CLOSURE PLAN

- i) Back filling proposal has not been explained properly. Exhausted area to be backfilled by OB/Waste to be specified with mRL and area on year to year basis with description of the method & manner of disposal of waste. The proposed backfilling bottom mRL, top mRL, quantity of backfilling etc. may be given.
- ii) Year wise plantation covering number of saplings to be planted, location and area covered may be furnished.
- iii) Updated air, water, noise, ground vibration and soil data with analysis from laboratory done at specified periodicity for last one year to be enclosed.
- iv) In the modification in the approved scheme of mining for the period 2016-17 to 2017-18, the net area considered for FA calculation is 69.7477 Ha where as in the review of mining plan submitted for the period 2018-19 to 2022-23 the area put on use at the start of plan indicated is 72.29 Ha. The figure may be rechecked and the area put on use at the start of plan may be rectified accordingly.
- v) In page 109, para 8.6, area under "Mineral Separation Plant" shown as 2.96 Ha at the start of the plan, whereas the area of 2.69 Ha under beneficiation plant has been included under mining during the plan period. Both the areas to be rechecked and rectified and accordingly the net area considered for FA calculation should be rectified/corrected in both text, tables and in financial assurance plan (drawing and table) (Plate No. XII)
- vi) Amount of financial assurance should be calculated as per rule 27(1) of MCDR-2017 and should be submitted accordingly in form of Bank Guarantee.

7.0 PLATES (General):

- i) The plans and sections submitted do not bear the certificate that --the plans and sections are prepared based on the lease map authenticated by the state government.
- ii) All plans and sections shall show a scale of the plan at least twenty five centimeters long and suitably subdivided. All plans & sections prepared shall follow the conventions mentioned under MMR 1961.
- iii) All plans and sections should be signed with date by certified Surveyor, Qualified Person, Mine Manager and Mining Geologist.
- iv) Magnetic Meridian and date of observation of should be given on all relevant plans.
- v) Existing and proposed bench mRL to be mentioned in the all plans and sections.
- vi) The UPL should be shown in red colour in all relevant plans and sections.

7.1.Surface Plan:

- i) Information of boundary pillars in UTM coordinates as well as in Latitude and longitude of all ML boundary points should be depicted in tabulated form on surface plan.
- ii) Few pillars may be correlated with some permanent ground features giving distance and direction.
- iii) Forest & Non forest area, Surface right acquired area etc. should be marked clearly and non-surface right area should be suitably hatched.

7.2. Geological Plan & Section:

- i) The Geological sections (Plate No. V) have not been plotted correctly in 1:2000 scale. The same should be corrected.
- ii) Data related to strike, dip, dip-direction etc. shown on the geological plans are inadequate. Some more structural readings data may be

- collected from BHJ exposures particularly in eastern and northern part of the lease and may be shown on the plan to understand the geology of the area and dip direction of ore body in geological sections.
- iii) The lithology shown at 337900E along section line KK' in Geological section (Plate-V) does not match with lithology shown in the geological plan. Same should be rectified. Accordingly, the estimation of float ore reserves may be checked and rectified.
 - iv) The borehole no shown in the geological sections are not legible enough. Same should be rectified. The index show already drilled boreholes and proposed boreholes in suitable colour code. The index/legend of Core, DTH & RC holes should be contrasting different with colour.
 - v) A separate plan showing the Lease area, Forest-Non-forest and Diverted Forest boundary, UNFC boundaries, Surface right area, explored area, unexplored area, mineralized and non-mineralized area, UPL, already drilled boreholes in black color and year wise proposed boreholes in relevant colors in a scale of 1:2000 to be submitted.
 - vi) The proposed boreholes to be plotted in dotted lines in Geological sections along with Collar Id, RL and proposed closing depth at the bottom of the borehole.
 - vii) Longitudinal Section maybe submitted.
 - viii) The index of Geological features should be same in both Geological Plan and Geological sections.

7.3. Development Plan & Section:

- i) Individual year wise development plan & sections to be shown in sharp contrasting color.
- ii) The index of the development features in the year wise development plan and sections should show development plan of previous years.

- iii) The index of proposed development feature in the development section during 2022-23 (plate no.VI (J)) should show the proposed development for the year 2022-23 with its corresponding color of development for the year as shown in the development plan of 2022-23.
- iv) Proposed backfilling to be shown in development sections from the year 2019-20 onwards.

7.4. Environment plan:

- i) The Environment Plan as prepared should be satisfy the provision as laid down rule 32(5) (b) of MCDR2017.
- ii) The provisions of rule 32 (5) (b) (ii), (iv) and (v) may be shown up to sixty meters beyond the boundary of lease area.
- iii) Contour lines at 5m interval may be shown up to sixty meters beyond the boundary of the lease area.
- iv) The existing and the proposed environment protective measures to be shown in environment plan. The drainage pattern of the lease area also to be shown on the plan.

7.5. Financial Assurance Area Plan:

- i) A Financial area Assurance plan may show all the items under the financial assurance table both existing and proposed. Effluent treatment plant has not been shown in the FA plan.

7.6. Conceptual plan:

- i. Conceptual plan may be prepared considering mineralization as revealed from the borehole logs. One longitudinal section may also be submitted. Direction of run off from the area based on surface contours may be shown on the plan and the sections.