



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



Phone: 0674-2352463;  
TeleFax: 0674-2352490;  
eMail:  
ro.bhubaneswar@ibm.gov.in  
Plot No.149, Pokhariput  
BHUBANESWAR-751016

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

दिनांक / Date: 25.01.2018

To

Shri C. R. Ray, Nominated Owner,  
M/s IMFA Limited, At- IMFA Building,  
Rasulgarh, Bhubaneswar, Pin-751 010, Odisha.

Sub: Approval of Modification of Mining Plan of Sukinda Mines (Chromite) over an area of 116.76 ha in Jajpur district of Odisha of M/s Indian Metals & Ferro Alloys Limited submitted under Rule-17 of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Ref: - i) Your letter no. IMFA/MPC/18/6 dated 10.01.2018.  
ii) This office letter of even no. dated 15.01.2018.  
iii) This office letter of even no. dated 15.01.2018 addressed to the Director of Mines, Govt. of Odisha, copy endorsed to you.


Sir,

This has reference to the letters cited above on the subject. The draft Modification of Mining Plan along with Progressive Mine Closure Plan has been examined in this office based on site inspection carried out on 05.01.2018 by Shri Dayanand Upadhyay, Sr. Assistant Controller of Mines. The deficiencies observed are enclosed herewith as Annexure-I.

You are advised to carry out the necessary modifications in the draft Modification of Mining Plan in the light of the contents vide Annexure-I 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 and JPG format in resolution of 100x100 pixels on same CD)** with financial assurance under Rule 27 of MCDR' 2017 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 Modification of Mining Plan document.

The para-wise clarifications and the manner in which the deficiencies are attended should invariably be given while forwarding the modified copies of the Modification of Mining Plan. It may be noted that no extension of time in this regard will be entertained and the Modification 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.

भवदीय / yours faithfully,

  
25/01/18  
(HARKESH MEENA)

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

Copy for kind information and necessary action to:

1. Shri A. K. Samantray, Shri M. J. Raju and Shri P. Behera, Qualified Person, M/s Indian Metals & Ferro Alloys Limited, At- IMFA Building, Bomikhal, Rasulgarh, Bhubaneswar-751018, Odisha

(HARKESH MEENA)

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

**Scrutiny comments on the Review of Mining Plan of Sukinda Chromite Mines over an area of 116.76 Ha of M/s IMFA situated in Dist. Jajpur, Odisha State.**

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**GENERAL:**

- I. Modification of Review of Mining Plan submitted under rule 17 of MCR2016 should be replaced with rule 17(3) as per Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rule 2016 and it should be refer also in text parts.
- II. The e-mail, phone & fax no. of lessee, forest diversified area, plan period should be furnished on cover page.
- III. The modification of review of mining plan has submitted for the year 2017-18 and 2018-19. Since the 09 month has been already lapsed for the year 2017-18 therefore proposal should be prospective in nature.
- IV. Page-5, Para-a, lease of co-ordinate in terms of latitude and longitude should be furnished.
- V. Page-6, Para-e, toposheet number has not been furnished.
- VI. Page-17, para3.6A, in reason of modification it is submitted that in the eastern side beyond section FF' the grade of chrome ore is varying from +10% to 48% against the projected ore grade of +52% Cr<sub>2</sub>O<sub>3</sub>. It is clarified that due to change in the quality of ore availability in the area approved for exploitation of chrome ore the lessee could not meet the specific requirement of grade wise chrome ore for its captive plant. The cut off grade of feed to chrome plant is +30% Cr<sub>2</sub>O<sub>3</sub> therefore the average grade of Cr<sub>2</sub>O<sub>3</sub> after blending and requirement of chrome plant based on cut off grade may be discussed.

- VII. The certificate furnished by lessee mentioned the Scheme of Mining/ Mining Plan/PMCP in different Para should be replaced with "Modification of Review of Mining Plan". The certificate furnished by qualified person may be corrected accordingly.
- VIII. A latest list of board of directors duly certified by competent authority along with address/contact nos. to be enclosed. Latest resolution w.r.t. nominated owner to be submitted.
- IX. All the annexure to be properly indexed/ numbered/ paged and signed by qualified person. All the certificates should bear dated signature.

#### **GEOLOGY:**

- I. The structural information like strike, dip, dip-direction etc have not been shown clearly. All these information should be reflected on geological plan and section. Further, Ore zone should be depicted on plan and section based on surface exposure, exploration data and threshold value.
- II. Page-27 to 31, the details of exploration carried since inception of mining operation till 2017 to be given in tabulated form i.e. year, BH number, Location (Coordinate), nature of BH (Core/DTH), Depth (max-Min), mineralized/non-mineralized, Inclination etc. The relevant forms for intimation of borehole and borehole logs to be submitted as annexures.
- III. All the drilled and proposed BH to be depicted on the Geological section along with mRL and its actual and proposed depth for better referencing.
- IV. A longitudinal vertical section as per MCDR, 2017 needs to be submitted showing different level of exploration and level of intersection of proposed BH. Proposal of exploration to be given in such a manner that entire Ore Body may be explored up to certain level. The assay plan should also be furnished.

- V. Page-32, non-mineralized area has been furnished 70.00 ha but level of exploration is not mentioned and no bore holes shown in non-mineralized area over geological plan. The status of lease area explored as per UNFC norms (in Ha) as on 01.04.2017 has to be re-assessed based on the influence of the boreholes. Accordingly, the re-defined limits of UNFC boundaries have to be demarcated over Geological Plan and UNFC plan.
- VI. The geological sections have not been drawn boundary to boundary as per guidelines of IBM Manual Appraisal MP 2014.
- VII. As per rule 12(4) MCDR, 2017 the entire potentially mineralized area should be under G1 level of exploration. Accordingly proposal of the exploration may be revised. Further proposal of exploration should also be furnished at regular grid interval to prove the non-mineralised area.
- VIII. Page-33, Para-i, it is mentioned that whole area explored under G1 level which is not correct.
- IX. Page-45 to 51, the reserves and resources estimated are not as per guidelines of Minerals (Evidence of Mineral Contents) Rules 2015. In the depth between mRL -250 to -430mRL the reserves estimated under 111 & 211 category are not justified with the regular intersection of bore holes.
- X. The UNFC code as furnished in text and in geological sections are not matched. It should be verified and rectified.
- XI. The details like potentially mineralized area and its extent (coordinate in WGS 84), 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.
- XII. All the drilled and proposed BH to be depicted on the Geological section along with mRL and its actual and proposed depth for better referencing.

- XIII. 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.
- XIV. Reporting of Mineral Resources in the format prescribed in Part IV-A of Minerals (Evidence of Mineral Contents) Rules, 2015.

#### **MINING:**

- I. Page-59, para(b)(l), Insitu tentative excavation, average grade of Cr<sub>2</sub>O<sub>3</sub> has not been furnished in table.
- II. Page-60, Para-c, in summary of yearwise excavation the gradewise bulk density considered should be furnished.
- III. Page-61, proposed method of mining, the table has not been furnished with top mRL, cross section considered etc.
- IV. Modification in development programme given in the approved mining plan has been proposed due to varying the grade of chrome ore from +10% to 48% against the projected ore grade of +52% Cr<sub>2</sub>O<sub>3</sub> in earlier approved excavation proposal. Since the cut off grade of feed to chrome plant is +30% Cr<sub>2</sub>O<sub>3</sub>, the excavation proposal should be such that optimum utilization of low grade by bending with high grade in the interest of mineral conservation.
- V. Page-62, calculation of machineries have not been furnished with taking parameters of bucket capacity, fill factor, swell factor, cycle time etc.
- VI. Quantum of production and development may be described year wise with no. of benches, mRL, depth of excavation, direction of advance, location and cross-section considered.
- VII. Refer development plan and section, temporary backfilling has been shown in north eastern part on benches 118RL, 110RL and 102RL.

Temporary backfilling will not be allowed in light of scientific development and conservation of minerals.

- VIII. Page-68, During 2018-19, 02 shaft sinking has been proposed for underground development in hanging wall. The location of selection of site for shaft sinking in hanging wall has not been discussed considering the parameters of rock mechanics. A schematic diagram of further proposed underground method may be submitted.
- IX. Bench mRL as shown in development plan should be re-checked with development section.
- X. Conceptual mining plan, cumulative waste generation and top soil generation and protective measures have not been furnished considering the life of mine As per IBM Manual Appraisal MP-2014.
- XI. Ultimate pit limit should be depicted on all relevant plans & sections.

#### **STACKING OF MINERAL REJECT/SUB GRADE AND DISPOSAL OF WASTE:**

- I. The analysis report of serpentine and nickeliferous limonite should be submitted and discussed for their future use on the basis of their physical and chemical properties.
- II. Existing waste dumps may describe with its location along with mRL in text. The top mRL of all above to be depicted clearly on plans.
- III. Details Existing and proposed retaining wall, garland drain, settling tank etc. to be given with their location in terms of length, width and height year wise.
- IV. Further, Build-up of dumps from year to year to be mentioned in text w.r.t. designed capacity of dumps, bottom and top mRL of individual terrace, dump slope, individual terrace height and slope with description of method & manner of disposal of waste should be mentioned.

## **MINE DRAINAGE**

Effluent treatment plant has not been described with its capacity and accumulation of water in pit considering water table encountered and average rain fall. The flowchart of ETP and treatment of hexavalent chromium should be furnished.

## **PROCESSING OF ROM & MINERAL REJECT**

A COB plant of 40T/hrs capacity has been proposed in 2018-19 for beneficiation of low grade chromite but their location has not been shown in development plan.

### **Chapter- "Other":**

An organizational chart has not been furnished. Proposed manpower both direct and contractual has to be mentioned in the text.

## **PROGRESSIVE MINE CLOSURE PLAN**

- I. Page-94, Para 8.1, human settlement has not been furnished with population distribution pattern around mines area, male female ratio, literacy etc.
- II. Page-109, the amount of financial assurance calculated is not as per rule 27(1) of MCDR-2017. It should be re-calculate and submit accordingly.
- III. Year wise plantation covering number of saplings to be planted, location and area covered may be furnished.
- IV. Updated air, water, noise, ground vibration and soil data with analysis from laboratory done at specified periodicity for last one year to be enclosed.



- V. Under impact on land, cumulative land degradation at present, at the end of proposal period and at the end of conceptual period may be given referring to conceptual mining plan given in scheme of mining.

**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. Wind direction may show through wind rose diagram in key plan and environmental plan.
- IV. All plans and sections should be signed with date by certified Surveyor, Qualified Person, Mine Manager and Mining Geologist.
- V. Magnetic Meridian and date of observation of should be given on all relevant plans.
- VI. Existing and proposed bench mRL to be mentioned in the all plans and sections.
- VII. The UPL should be shown in red colour in all relevant plans and sections.

**Surface Plan:**

- I. Surface plan needs to be updated and all the drilled BH to be shown drilled boreholes in black color and year wise proposed boreholes in relevant colors.
- II. Few pillars may be correlated with some permanent ground features giving distance and direction. Different land use may be shown with colour codes.

- III. 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. Further, the nomenclature of the grid to be given both the side of the grid.
- IV. Forest & Non forest area, Surface right acquired area etc. should be marked clearly.

**Geological Plan & Section:**

- I. Data related to strike, dip, dip-direction etc. shown on the geological plans are not clearly shown.
- II. In the Geological Plan UNFC boundaries, explored area, unexplored area, forest area, non-forest area, forest diverted area, drilled boreholes in black color and year wise proposed boreholes in relevant colors to be shown.
- III. 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.
- IV. The index of Geological features should be same in both Geological Plan and Geological sections. Some of the index is missing. It is to be checked.
- V. Grid lines have not been marked in geological sections.
- VI. In Geological plan, the contour to be shown over the area wherever it is missed out.

**Development plan & Section:**

- I. The index should be same in both development Plan and sections. Some of the index is missing. It is to be checked.
- II. Grid has not been marked in development sections and dump section.

- III. Existing position of waste dump and proposed dump height is to be marked with mRL.
- IV. Yearwise wise progress of waste dump may show clearly with different colour.

**Environment plan:**

- I. The Environment Plan as prepared should be satisfy the provision as laid down rule 32(5) (b) of MCDR2017.
- II. Surface features of adjacent mine has not been shown in core and buffer zone.
- III. The proposed and existing environment protective measures to be shown in environment plan. The drainage pattern of the lease area also to be shown on the plan.
- IV. Contours should be shown in core zone.

**Financial Assurance Area Plan:**

In the Financial Assurance plan area of each individual land i.e. land degradation due to mining activity and processing unit etc. at the end of plan period may be shown separately on this plan with highlighted boundaries and different colour codes for FA calculation.

**Reclamation Plan:**

Year wise progress of dumping, stacks, afforestation using different colour codes for easy understanding may be shown.

**Conceptual plan:**

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.

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