



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. RMP/A/32-ORI/BHU/2020-21

Date: 21.10.2020

सेवामे

Shri Sauvick Mazumdar, Nominated Owner,  
M/s Ferro Alloys Corporation Ltd,  
Laxmi Bhawan, Kuans ,  
Dist-Bhadrak, Odisha-756100

विषय: Approval of Review of Mining Plan of Ostpal Chromite Mine along with Progressive Mine Closure Plan (PMCP), over an area of 72.843 ha in Jajpur district of Odisha State, submitted by M/s Ferro Alloys Corporation Ltd under Rule 17 of MCR, 2016.

- संदर्भ: - i) Your letter No. BHF/AC/3A/437/2020 dated 07.10.2020.  
ii) This office letter of even no. dated 12.10.2020.  
iii) This office letter of even no. dated 12.10.2020 addressed to Director of Mines, Government of Odisha copy endorsed to you.

महोदय,

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 by Shri Dayanand Upadhyay, Senior 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 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 USB Pendrive/Flash drive 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 USB Pendrive/Flash drive )** 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.

भवदीय,  
(हरकेश मीना)  
क्षेत्रीय खान नियंत्रक

Copy for kind information and further necessary action to Shri A K Patra & Shri I Rama, M/s Ferro Alloys Corporation Ltd, Laxmi Bhawan, Kuans, Dist-Bhadrak, Odisha-756100.

(हरकेश मीना)  
क्षेत्रीय खान नियंत्रक



**Scrutiny comments on examination of Review of Mining Plan of Ostapal Chromite Mine over an area of 72.843 Ha in Jajpur District of Odisha State of M/s FACOR**

**GENERAL:**

1. On cover page, Review of Mining Plan under rule 17(2) of Minerals (Other than Atomic & Hydrocarbons Energy Minerals) Concession Rules, 2016 along with Progressive Mine Closure Plan under rule 23 of MCDR 2017 is to be furnished. The diversified forest area is also to be mentioned on cover page. The phone no., e-mail and address of the qualified persons should be furnished on cover page. The certificate submitted by qualified person, there is mentioned modified review of mining plan. Since the instant document is the review of mining plan, it may be corrected accordingly.
2. In introduction chapter, history of Mining lease along with change of ownership/nominated owner has not been described in details. Page-2, modification of review of mining plan under rule 11 of MCDR should be omitted as it is approved under rule 17(3) of MCDR 2017. Notice of change of ownership/nominated owner under rule 50 of MCDR 2017 may be submitted.
3. Page-9, Para-2.b.3, the co-ordinates of all the boundary pillars have not been furnished. The UTM co-ordinates should also be furnished along with latitude and longitude.
4. Page-10, Para-3.1.4, period of modified review of mining as furnished is not correct. Para-3.2, reason of modification of review of mining is to be discussed in brief. Para-3.3.3 & 3.3.4, Page 11, the review of earlier approved proposal, the ROM production and excavation of waste have not been updated till September 2020. All the updated figures should be furnished.
5. Lessee is a company. Hence, all certificates, undertakings, consent letter etc. should be signed by the nominated owner only. Extract from the minutes of the Board of director meeting with list of Board of Directors, their phone no. address and declaration of nominated Owner to be furnished.
6. The experience certificate of all qualified person should be as per provision of rule 15(1)(b) of MCR 1960. Qualified person address, e-mail, Phone number, Mobile number, PIN code and Fax no. should be furnished on cover page.
7. Sequence of para and its numbering as per IBM Manual appraisal MP 2014 should be covered in text. All the annexure and text to be properly indexed/ numbered/ paged and signed by qualified person. All the certificates/annexures should bear dated signature.

**GEOLOGY:**

8. In Chapter Geology and Exploration the sequence of paragraph and its numbering should be covered in chronicle order as per IBM Manual Appraisal MP 2014.
9. Disposition of various litho units indicating structural features of lease area are not correctly furnished. The lithology shown in the borehole log should be match with the lithology shown in geological plan and sections. The strike, dip, dip-direction should be shown in bold color in geological plan.
10. Page-26, Para(e), the details of exploration carried since inception of mining operation 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.
11. In page 29, Para (iii), the details of the sample analysis indicating type of sample should be given in tabulated format and nos. of sample analysis from NABL/Govt. lab out of total sample should be furnished alongwith annexure.
12. Page-30, Para-(i), the complete lease area should be proposed to cover under exploration under G1 level upto end of mineralization as per provision of rule 12(4) of MCDR, 2017. The year wise proposal for drilling to be shown in different contrasting color in both Geological Plan and Geological sections.



13. The proposal of exploration to be given in following format:

Year	BH no.	Northing	Easting	Collar RL	Core/DTH	Meterage	Inclination	Forest/Diversified forest/non fores	Surface right/non surface right	Purpose of bore holes

14. The area explored under G1/G2....have not been marked as per as per Minerals Evidence of Mineral Contents Rules 2015.
15. In the Geological plan, the profile of UPL has not been marked. In the Geological plan and sections, the UPL should be drawn properly considering the mineralization over the lease area. The UNFC codes should be distinctly shown.
16. A longitudinal vertical section as per MCDR, 2017 needs to be submitted showing different level of exploration and level of intersection of proposed BH.
17. In page no. 33, Para-J, the method of reserve estimation may be further elaborated and justified w.r.t recovery factor, Bulk density, Length of influence, nos. cross sections and bore holes considered in reserve and resource estimation. Necessary supporting documents to be furnished with respect to bulk density and recovery factor.
18. Page no.-36, summary of reserve and resources as furnished in table as on 31/08/2020 is not matched after total depletion of ROM production carried out from 2018-19 to 202-21(till 31/08/2020). It should be re-checked and corrected. Enhancement of further reserve and resources without back data of bore holes/ fresh exploration will not be acceptable.
19. Reserve and resources are not prepared as per Minerals Evidence of Mineral Contents Rules 2015. The summary of detailed calculation of reserve and resources enclosed at annexure-12 is not furnished the calculation of section wise resources under 331 category. After deriving the total resources under 331 category, mineable reserve under 111 and resources under 211 category should be furnished. The justification of UNFC coding should be furnished as per Minerals (Evidence of Mineral Contents) Rules, 2015.

**MINING:**

20. Page-64, existing method of mining should be described with production capacity, machineries used, height of existing benches etc. The dimension of existing pit/block should furnished in following table.

Name of pit/Block	Location	Length	Breadth	Depth	Top mRL	Bottom mRL	No. of benches in ore/No. of benches in OB	Pit slope	Area backfilled	Area reclaimed & rehabilitated

21. Sequence of paragraph and its numbering has not been be covered in chronicle order as per IBM Manual Appraisal MP 2014. Proposed method of mining should be furnished in light of development plan i.e production capacity, nos. of pits proposed for production, waste dump and other designing parameters to be discussed.
22. Year wise development and production plan should be furnished in the following tabulated format.

Particular for the year...	
Bench Geometry	Height (in m)
	Width (in m)
	Individual bench slope angle
Quarry Development	Location (Quarry Name)



	Extent of Development (coordinates)	
	Sections considered for development	
	Number of benches	
	Benches considered for development with RL	
	Top RL	
	Bottom RL	
	Direction of advancement	
	Dimension of the quarry at the end of the year including existing benches	
	Area occupied (in sq.m)	
	Overall quarry slope angle	
	Production of Ore (in MT)	
	Generation of Mineral rejects ore from quarry (in MT)	
	Production of ROM (Ore + Mineral Reject) in MT	
	Total Generation of waste (in cum)	

23. In year wise tentative calculation of ore the quantity of ore for the year 2022-23 as furnished in table 4(A) & (B) is not matched with calculation table as furnished at annexure-12. The RL of the benches as furnished for calculation ore and mineral reject are not matched with the cross sections. The quantity of waste/OB is to be excavated during mining operation year wise have not been furnished in calculation table.
24. Page-62 & 63, in year wise insitu tentative excavation the average grade of ore and mineral reject are to be furnished. The stripping ratio has not been depicted with their unit. In bullet notes cut off grade, bulk density and recovery factors considered should also be furnished.
25. The study of the slope stability as enclosed in the annexure does not reveal the ultimate pit limit and ultimate depth of the opencast working. It has been proposed to working upto 20 mRL resulting change the ultimate pit limit below 45 degree. In light of above the detailed slope stability study should be furnished from reputed institution.
26. It has been observed that the mineralization is continued in depth therefore backfilling of the quarry as proposed in western part from 150mRL to +20mRL is not permissible in light of scientific development and conservation of mineral.
27. Page-64, Para-( e), describe briefly the layout of mine workings, pit road layout, the layout of faces and sites for disposal of overburden/waste along with ground preparation prior to disposal of waste, reject etc.
28. In conceptual mining plan, life of the mine is not correctly furnished considering the present production capacity. Cumulative waste generation and protective measures should be furnished properly. In pursuant to the order dated 14.01.2020 passed by MoM, GoI, consequent up on the order dated 08.01.2020 of the Hon'ble Apex Court passed in W.P.(C) No. 114/2014, the lessee shall carryout "re-grassing in mining area after closure of mines". Accordingly it should be discussed during conceptual period

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

29. Proposed waste dump have not been described with its location along with their RL and co-ordinates in text. The top RL and its extension year to year basis have not been depicted clearly on plans in different color codes. Further, Build-up of dumps from year to year have not been mentioned in text w.r.t. designed capacity of dumps, bottom and top mRL of individual terrace, dump slop, individual terrace height and slope with description of method & manner of disposal of waste.
30. The proposal for construction of retaining wall, garland drain may furnish year wise in different color codes in terms of their length width and height. All the proposed dumps should be outside the UPL. If any

existing dump lies within UPL, therefore their handling proposal should be proposed in view of conservation and scientific development of mineral. Need to do necessary corrections.

31. The analysis report of serpentine and nickeliferrous limonite should be submitted and discussed for their future use on the basis of their physical and chemical properties. The proposal is to be submitted for carrying out detail scientific study from institute of repute on slope stability for North and South dumps and implementation of recommendation of study for attaining proposed dump height.

#### **PROCESSING OF ROM AND MINERAL REJECTS**

32. Page-97, the year wise feed quantity of mineral reject is not matched with insitu tentative excavation. It may be clarified. The material balance chart is to be furnished. The ROM feed grade and tonnage with recovery%, grade and tonnage of product at each stage of processing may be shown in the flow sheet along with block diagram. Output products with physical and chemical composition (with nomenclature of product) should be furnished with recovery percentages.

#### **PROGRESSIVE MINE CLOSURE PLAN:**

33. Page-117, Para-8.1, Baseline information of the lease area has not been described as per guidelines. Further, base line information to be furnished for surrounding 500 meter form lease boundary.
34. Page-142, Para-8.3.1, it is mentioned that no backfilling has been proposed while in other part of the text and in plan backfilling has been shown. It needs correction.
35. Page-142, Para-8.3.2, proposed tailing pond with their location, shape and size, capacity, safety measures taken and manner of tailing disposal should be described. Page-145, the year wise reclamation proposal has not been furnished in standard format.
36. Monitoring station of air, noise and water should be described in text and their locations furnished in tabular form. Updated air, water, noise, ground vibration and soil data with analysis from laboratory done at specified periodicity to be enclosed.
37. Mitigation measures of impacts associated with mining i.e. mainly related to air, water, noise, vibration, land, etc. are not given properly. The same to be elaborated. Year wise plantation covering number of saplings to be planted, location and area covered may be furnished.

#### **FEASIBILITY REPORT:**

38. The content of feasibility/pre-feasibility report and analysis of economic viability of the project is not described in detailed as per rule 16 and Part-V of MEMC Rule 2015. A Feasibility Study is a detailed comprehensive economic study of the selected development option for a mineral project. The economic viability of the project should be supported with NPV, IRR, Payback period by cash flow chart with total investment

#### **PLATES (General):**

39. All plans and sections should be signed with date by certified Surveyor, Qualified Person, Mine Manager and Mining Geologist. The date of observation of magnetic meridian and its declination is to be shown in relevant plans.
40. The plans and sections submitted should bear the certificate that --the plans and sections are prepared based on the lease map authenticated by the state government. All plans and sections shall show a scale of the plan at least twenty five centimeters long and suitably subdivided.



41. Key plan as submitted is to be demarcated with the boundaries of all villages and towns with their population, forests with tree density, approach road to lease area. Existing and proposed bench mRL to be mentioned in the all plans and sections. The UPL should be shown in red colour in all relevant plans and sections.
42. **Surface Plan:** Few pillars may be correlated with some permanent ground features giving distance and direction. Virgin area to be shown by contours and spot RL in surface plan. Forest & Non forest area, Surface right acquired area etc. should be marked clearly.
43. **Geological Plan & Section:** Cross-sections & longitudinal sections have not been marked in geological plan, Data related to strike, dip, dip-direction etc. shown clearly on the geological plan. In the Geological Plan UNFC boundaries G1, G2..., explored area, unexplored area, drilled boreholes and year wise proposed boreholes to be shown in relevant colors. In sections UNFC codes have not been furnished as per MEMC rules 2015 & not visible. Some of the bore holes are not matching with plan and existing benches are not clearly marked. The proposed bore holes are to be marked in sections and litho units should be matched with bore hole logs. Geological sections not matched with the calculation table of reserve & resources.
44. **Development plan & Section:** Cross-sections & longitudinal sections have not been marked in development plan. In dump plan sections lines also not marked. The existing benches are not shown distinctly with their RL. The sequence of development of benches of previous year should be followed in next year development plan. The color codes of Development Plan and Section should be same. Different types of ore encountered through bore holes and based on bore holes data, ore profile and their nomenclature to be corrected accordingly.
45. **Environment plan:** The Environment Plan as prepared should satisfy the provision as laid down rule 32(5) (b) of MCDR2017. The drainage pattern of the lease area, contours in core zone and surface structure in buffer zone should be shown.
46. **Conceptual plan:** Conceptual plan may be prepared considering mineralization as revealed from the borehole logs. Direction of run off from the area based on surface contours may be shown on the plan and the sections.



(Dayanand Upadhyay)  
Sr. Assistant Controller of Mines