



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/14-ORI/BHU/2019-20

Date: 21.10.2019

सेवामे

✓ Shri T V Narendran, Managing Director & Nominated Owner,  
M/s Tata Steel Ltd,  
At/P.o- Jamsedpur,  
Dist – East Singbhum,  
Jharkhand - 831001

विषय: Approval of Review of Mining Plan of Bamebari Manganese Mine along with Progressive Mine Closure Plan (PMCP), over an area of 1150.55 ha (retained area 464.00 ha) in Keonjhar district of Odisha State, submitted by M/s Tata Steel Ltd under Rule 17 of MCR, 2016.

- संदर्भ: - i) Your letter No. MGM/P&E/701/19 dated 23.09.2019.  
ii) This office letter of even no. dated 26.09.2019.  
iii) This office letter of even no. dated 26.09.2019 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 based on site inspection carried out on 12.10.2019 by Shri Kewal Krishan, Regional Mining Geologist & 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 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.

भवदीय  
हरकेश मोना  
21/10/19

क्षेत्रीय खान नियंत्रक

Copy for kind information and further necessary action to Shri Sabyasachi Mishra, M/s Tata Steel Ltd, At/PO- Bichakundi, Dist- Keonjhar , Odisha-758034.

(हरकेश मीना)  
क्षेत्रीय खान नियंत्रक

**Scrutiny comment of Review of Mining Plan including PMCP in respect of Bamebari Iron & Manganese mine, Lease area 1150.55 ha. (Retained area 464.0 ha) of M/s TATA Steel Ltd in Keonjhar district of Odisha State.**

**GENERAL:**

- I. E-mail, phone & fax no. of lessee, location of mines i.e village, tehsil, district etc have not been furnished on cover page. In introduction chapter history of the mines should be described with documentary evidence and marked with annexure.
- II. Page-8, at present the EC capacity of the mines is 0.83 LTPA for manganese ore and further enhancement of production leads to fresh environmental clearance. Therefore it may be described in introduction chapter with reason of enhancement of production alongwith documentary evidence if any like application submitted to MOEF, copy of correspondence and TOR issued etc.
- III. Page-9, Para-1(e), It is furnished that lessee intends to mine Manganese and Iron ore while in proposal only manganese ore production has been furnished. It may be clarified and modified accordingly.
- IV. Page-10, Para-2(a), discontinuous blocks of lease area bounded by longitude and latitude should be furnished.
- V. Page-18, Para-3.2 reason of last modification should be furnished with specific reference of document approved on last occasion. Page-20, Table no.-7, review of proposed production and actual production should be furnished with mineral reject. Page-21, Table no.-9, actual figure of retaining wall and garland drain have not been furnished correctly.
- VI. The experience of qualified person should be clearly stated in supervisory capacity in the field of mining as per provision of rule 15(b) of Minerals (Other than Atomic and Hydro Carbons of Energy Minerals) Concession Rules, 2016.
- VII. Sequence of paragraph and its numbering should be covered as per IBM Manual Appraisal MP 2014.
- VIII. The annexure submitted are not indexed. All the annexure to be properly indexed/ numbered/ paged and signed by qualified person. All the certificates should bear dated signature.

**GEOLOGY:**

- I. 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.
- II. Under heading Geology and exploration proper heading is to be given for topography, drainage, vegetation, climate, rainfall and then their disruption is to be furnished.
- III. Page-28, Para-(c), detailed under local geology average thickness of various litho units as encountered in the bore holes drilled are to be furnished.
- IV. Page-29, Para-(d), under headings detailed of prospecting/ exploration already carried out, the details of prospecting/ exploration carried out earlier are to be discussed under this heading. Similarly this is to be mentioned in the paragraph that the same has been already considered/furnished in earlier approved document.
- V. Page-32. Table1.2, the block wise detailed exploration and cumulative summary of exploration of lease area should be furnished in following table.

Total Lease Area: ..... Ha						Remarks/ comments including reasons for not carrying out the exploration as per UNFC norms
Item of Information	Lease area explored as per UNFC norms (in Ha) as on dt.....					
	Total lease area = A+B+C+D+E					
	G1 Level	G2 Level	G3 Level	Explored and found non-mineralized with level of exploration (Remarks)	Un-explored lease area	

	A	B	C	D	E	F
Area as per level of exploration						
No. of BH drilled						
No. of BH considered for Resource						
Meterage drilled						
Grid Interval						
Scale of Mapping						
Reserve estimated after above exploration as on dated: .....						
Remaining Resource after above exploration as on dated: .....						
Total Reserve / Resource after above exploration as on dated:.....						

VI. P  
age-32,  
Para-  
(iii),  
details

of total sample collected and number of sample analysis from private lab and from NABL accredited/Government Laboratory should be described and bore hole wise analysis report to be enclosed in annexure.

VII. Page 34: 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 MCDR2017. Only core bore holes are to be proposed in case where enhancement of reserve/resources are to be done in future. The proposal of exploration to be given in following format:

Sl.No	Year	BH No	Northing	Easting	Collar RL	Core/RC/DTH	Meteage	Inclination	Forest/Non-Forest/ diverted Forest	Surface Right/ Non-Surface	Purpose of BH
1											
2											

At the end of the table cumulative number of proposed BH in forest area, non-forest area, diverted forest area, Surface right area and non -surface right area to be given.

- VIII. The drilled bore holes and their bore hole logs along with their analysis is to be enclosed in annexure.
- IX. The Geological boundaries of exploration limit i.e. G1/G2/G3/G4 etc. are not marked as per Minerals Evidence of Mineral Contents Rules 2015. It should be modified and accordingly, the reserves/resource estimation calculation, geological plan and Sections need to be revised.
- X. The information furnished in geological plan (blockwise) on 1:5000 scale is not clear and legible. Therefore the geological plan (blockwise) should be prepared on the scale of 1:2000 and geological section should be on same scale. All the geological section should be drawn boundary to boundary. The proposed bore holes should marked with their proposed depth in sections.
- XI. Page-34, parameters for reserve/ resource estimation are to be discussed in details as per IBM Manual 2014.
- XII. Litho of surface geology as furnished in section is not matched with geological plan. Projection of ore body on geological cross section is not justified. The same are to be projected/prepared as per MEMC Rule 2015.
- XIII. Page-38-39, The UNFC codes of 111, 121, 122, 221 & 222 as furnished in reserve & resources table are not shown in cross section. The resources furnished under 331,332 & 333 category not justified with bore holes data and not clearly depicted in geological plan and sections. The iron ore lying under UPL is considered under resources which is not justifiable. Nomenclatures of various grades are to be done as per the revised threshold value of minerals dated 25<sup>th</sup> April 2018. Need correction at all the relevant places of the document.
- XIV. Under calculation of resources the headings is to be given as block wise resource estimation that is level of exploration (G1/G2/G3) instead of proved mineral reserves(111), probable mineral reserve(122) &

inferred mineral resources(333). Similarly in the table bore holes considered on the section lines should be furnished.

- XV. Reserve/resources within the lease may be arrived after discussing various axis of UNFC i.e economic axis, feasibility axis and geological axis. An updated reserve/resources as per UNFC may be arrived after applying the above set three axis.

**MINING:**

- I. Para (c), (d) & (e) of IBM-Manual-Appraisal-MP 2014 have not been discussed. All the parameters should be furnished as per IBM-Manual-Appraisal-MP 2014 in chronicle order.
- II. Page-41, para-2.0, existing method of mining should be described in brief. 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.
- III. Page-45, Table-2.3, area reclaimed and rehabilitated as furnished should be referred with backfilled area and nos. of benches to be bifurcated with ore and OB. Page-46, Table-2.4, dumps as furnished should be furnished with active & dead and each dump to be designated with proper nomenclature.
- IV. Common boundary working as proposed in development plan should be described in text alongwith permission of State Govt. and other statutory clearance obtained if any.
- V. The modalities of work of common boundary should be furnished. Insitu ROM/OB excavation to be furnished in separate column along with year wise cumulative production. A separate development plan and section of common boundary workings should be furnished as discussed during field inspection.
- VI. Page-51, average grade of ore and mineral reject should be furnished with bullet notes of bulk density and their recovery percentage.
- VII. In table-2.8A, 2.8B & 2.8C, calculation of ROM & OB should be specified with cross section. Proposed drilling and blasting has not been furnished alongwith drilling pattern, delay used, type of explosives and its storage. Page-81, in requirement of machineries the parameters, swell factors, lead distance, idle time, availability etc to be considered.
- VIII. It has been observed that in proposed insitu excavation of manganese ore, iron ore is also simultaneously mined out at some place as shown in sections. Therefore quantity of iron ore and its grade to be mined out should be furnished along with its storage for future utilization.
- IX. Surface topography and lithological structure of development plan not matched with development section. Development plan and section of each block should be prepared on the scale of 1:2000 so that extension of pits, dumps and backfilling to be furnished in single plan for better understanding.
- X. Bore holes have not been depicted in development section. Different types of ores and others geological information encountered through bore holes to be depicted clearly in development sections.
- XI. Back filling proposal as furnished in development plan has not been explained text. Exhausted area to be backfilled by OB/Waste to be specified with RL and area on year to year basis with description of the method & manner of disposal of waste.
- XII. 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. It should also be ensured that during backfilling original sequence of lithology of the lease area to be maintained.
- XIII. In conceptual mining plan, cumulative waste generation and backfilling and protective measures should be furnished properly. Restoration of safety zone, dead dump and slope of the dump may describe properly.

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

- I. Page-119, the nature and quantity of top soil and OB/waste generated during mining operation has not been furnished as per guidelines. The location of dumping proposal of mineral reject & OB generated during mining should be furnished blockwise with their coordinates.
- II. The extent/location of the proposed dumps to be given also mentioned whether within UPL or not. Also give the details of the existing dumps (top soil, waste dump, mineral reject dump) within the lease area in tabulated form comprising dump number, designed capacity, present quantity, remaining quantity, bottom RL and top RL.
- III. The details of mineral reject dumps and their analysis report should be submitted and discussed for their future use on the basis of their physical and chemical properties.
- IV. Page-130, details Existing and proposed retaining wall, garland drain, settling tank etc. to be given yearwise with their location. Location of sub-grade storage along with year to year development of the SG dumps to be given.

### **USE OF MINERAL AND MINERAL REJECT:**

Page-133, it is mentioned that the surplus ferromanganese is sold to domestic and international customers. Since it is captive mines therefore it may be modified accordingly.

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

- I. Page-157, Table-8.2, the proposed land use pattern has not been furnished with existing land use pattern. The additional requirement of area under different heads specifically mentioned during plan period.
- II. Page-163, Para 8.3.1, backfilling and reclamation and rehabilitation should be described block wise and pit wise in view of area matured for backfilling and reclamation and rehabilitation proposed with their location.
- III. Page-157, 164 & 165, existing land use pattern and proposed as furnished in table is not matched with final table of FA calculation depicted at page no.-173-176 and some of the items are missing. Therefore amount of financial assurance should be re-calculated as per rule 27(1) of MCDR-2017 and submitted accordingly.
- IV. Monitoring station of air, noise and water should be described in text and their locations furnished in tabular form.
- V. Updated air, water, noise, ground vibration and soil data with analysis from laboratory done at specified periodicity to be enclosed.
- VI. 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.
- VII. Mitigation measures of impacts associated with mining i.e. mainly related to air, water, noise, vibration, land, aesthetics etc. are not given properly. The same to be elaborated.
- VIII. Year wise plantation covering number of saplings to be planted, location and area covered may be furnished.

### **FEASIBILITY STUDY REPORT:**

Financial analysis is not carried out as per UNFC guidelines. It should be carried out based on real time cost. Viability of the project should be analyzed up to the ultimate depth considering following points: Capital cost, Cash flow forecast, Investment cost, Inflation forecast, Operating cost, Sensitivity studies, RR, IRR, NPV for the project life, cost of operation, Closure cost and Rehabilitation cost etc.

**PLATES:**

- I. All the plan and sections should be signed with date by certified surveyor, qualified person, mines manager and mining geologist. The plans and sections submitted 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 sign conventions mentioned under MMR 1961.
- III. Wind direction may show through wind rose diagram in key plan and environmental plan. Approach road to the ML to be shown.
- IV. Existing and proposed bench RL to be mentioned in the all plans and sections. The UPL should be shown in red colour in all relevant plans and sections. Magnetic Meridian and date of observation of should be given on all relevant plans. Approach road to the ML to be shown.
- V. Geo referenced cadastral map of the lease area is to be enclosed with the document.

**Surface Plan:** Surface plan is to be prepared on non earth scale. Few pillars may be correlated with some permanent ground features giving distance and direction. Different land use may be shown with colour codes. 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.

**Geological Plan & Section:** Data related to strike, dip, dip-direction etc. shown clearly. UNFC boundaries of G1, G2.. explored area should be shown distinctly in plan in place of UNFC codes. All the geological plan & sections should be revised considering the scale of 1:2000. Geological sections to be drawn boundary to boundary and it should be matched with geological plan. In sections UNFC code of reserve/resources should be marked correctly and UPL to be revised prevailed of mineralization of lease area. Exploration proposal to be revised and proposed bore holes should be depicted in geological plan & sections. Geological plan covering all three blocks is be enclosed with the document.

**Development plan & Section:** In development section UPL should be revised considering the mineralization as per bore holes data. Development plan and section should be revised considering the scale of 1:2000. Existing and proposed RL of benches/dumps should be mention clearly in development plan and section. Retaining wall and garland should be marked clearly yearwise with colour codes. UPL should be shown in red colour. Backfilling area depicted yearwise in different colour with their RL.

**Environment plan:**

- i. The Environment Plan as prepared should be satisfy the provision as laid down rule 32(5) (b) of MCDR2017.
- ii. 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.
- iii. Contours should be shown in core zone.

**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.