

Annexure-I

Scrutiny comments on the Modification of Approved Mining plan along with Progressive Mine Closure Plan of Balaji Iron Ore Mine over 19.331ha of Shri. Anil Khirwal, in village Balijore of Chaibasa Taluk of Singhbhum (West) District submitted under Rule 17(3) of MCR 2016 and 23 of MCDR 2017 for the period from 2020-2021 to 2022-2023 (upto 30.04.2022).

Date of last inspection: 23.2.2021

General:

1. Certificates: Word 'lessee' should be used instead of 'applicant' in case of existing lease. Instead of Scheme of mining it should mentioned a Review of mining plan.
2. The reason for modification is not mentioned on page-2. Please elaborate in case expansion or change of site of proposed working etc.
3. The entire chapter of mining & in general everywhere in the text & drawings it is spelled up in two parts i.e. as per present EC & proposed. Overall this appears as if an application for EC. You are advised to state the proposal only and not in two bifurcations.

Location and accessibility:

1. Number of Boundary pillar co-ordinates shown in text part are differ from number of boundary pillar shown in plan.
2. The lease area is not falls under CRZ, whereas in page-5 it mentioned as yes.

Details of approved Mining plan/ Scheme of Mining:

1. The year wise production & development quantity should be updated & given till date based on statutory annual/ monthly returns submitted to IBM & deviation should be justified. The proposed & achievement should be mentioned as per approved plan proposal i.e. Latitude & Longitude/ RL etc. & actual workings done should be discussed in tabular form with proper justification. Reason for development in the 7.5m safety barrier & lease boundary may also be described.
2. As per monthly return April 2021, total production from mines is 6165 tons, whereas submitted draft copy shows no details about 2021-2022. Further there is information about development quantity carried out during 2019-2020 and 2020-2021 till date. Waste generation table is given in cu.m but figures are shown in tons. Uniform units should be mention in all the tables.
3. Under review of earlier approved mining plan there is no discussion about 15% waste generated quantity. How much quantity has been achieved against 11099 tons during 2019-2020 and 45000 tons during 2020-2021, waste proposed in approved mining plan period to be discuss. Recovery has increased from 85% to 100% to be discussed.
4. Para-3.3.4:- During this approved plan period, it is proposed to plant 1685 saplings and gap plantation, whereas it is mentioned only 467 saplings has been planted. Reason for deviation to be discussed. During 2019-2020, 276 plants has been planted in 7.5m safety barrier and Dump-1, whereas violation has been issued for re-handling dump-1 on 09.03.2021.
5. Para-3.3.5:- There is proposal for backfilling in Puja Pit during this approved plan period, against that Mahabir Pit has been backfilled on the extreme southern side and reason may discuss. How much quantity of waste has been used for backfilling the pit may be given. Whereas submitted draft copy mentioned that backfilling proposal and no achievement. Yearwise proposal and achievement to be discussed.
6. Last five years violation, show cause or suspension and their compliances should be discussed and copy is also to be enclosed as annexure.

Geology:

1. The topography of the lease area is not discussed properly. The elevations within the lease area and nature of the land are not discussed properly.

2. Under Geology of the lease area type of the deposit, shape and size of the ore body, structural features if any needs to be discussed. Banded Hematite Jasper occurs in the western part near to Boundary Pillar -2 & 3, but as plan that area is not exposed and till they are virgin area only. The thickness of ore body is mentioned as 10m in puja pit, whereas already pit has reached 15m depth towards south side and 25m in northern side of puja pit.
3. Dimension of existing quarries shown in Page-21 is differ from approved review of mining plan, i.e, Top RL of Ganesh Pit-A has increased from 501.68m to 503.07m and depth also increased from 7.50m to 11.18m even though Ganesh pit is not working in last 2 years. Borehole log enclosed is totally differs from approved document, such as date, depth, lithology, depth and analysis result. In last approved document only 29 boreholes has been drilled, whereas submitted draft copy shows 35 boreholes. It needs to be explain.
4. Para 1.e: Earlier exploration carried out so far in the lease area should be summarized as per table below and given in the text.

Total Lease area:						
Item of information	Lease area explored as per UNFC norms (in Ha) as on dt...					Remarks/ Comments including reasons for not carrying out the exploration as per UNFC norms.
	Total Lease area = A+B+C+D+E					
	G1 Level	G2 Level	G3 Level	Explored and found non-mineralized with level of exploration (Remarks)	Unexplored lease area	
	A	B	C	D	E	
Area as per level of exploration						
No. of BH Drilled						
No. of BH considered for Resource Estimation.						
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:						

5. Detailed estimation sheet for reserve and resources need to be furnished showing sectional area as per UNFC category, influence, BD, recovery factor, location on plan & sections etc. The basis of bulk density and recovery factor should be given on the field tests conducted for different grade of minerals. Test result on moisture contents may also be included. Based on Cut-off grade/ threshold value (i.e. revised threshold value) may also be considered for estimation of reserves & resources. Recovery of mineral should be established from recognized laboratory. Refer Minerals (Evidence of Mineral Contents) Rules 2015 for exploration grid interval to be followed for UNFC reserves & resources estimation.
6. The submitted geological x-section is not at all matching with the plan & borehole logs. The geological axis has been categorized into G1 category on the basis of a single hole as reflected from few of the sections. The interpretation of the ore body is not correct as per the submitted logs. Even in

some sections where-in no waste are shown e.g 2451400N the same are reflected in the logs. In the same section near the bore hole DTH-13 it has been shown as upper benches have been backfilled whereas the immediate level below is void. The drawings have been made hypothetically. No extrapolation of resources needs to be done both laterally & vertically. As already stated above the borehole logs submitted are not matching with the earlier document. All the resources are to be re-assessed & needs to be first brought under different axis of UNFC i.e G1, G2 etc as per the extant MEMC Rules, 2015. The backup calculation in this regard to be brought about clearly in the Annexure. Both level wise & section wise reporting of the resources established shall be carried out with supporting documentation. The above correction shall be reflected in all relevant plans & sections.

7. It has been stated under the economic axis that iron ore from 45-55% Fe can be economically extracted whereas the cut off has been stated as 57% in Table No. 11. Such low-grade ore generation has not been reported separately in the chapter of mining.
8. Reserves have been reported under 122 category, where-as no pre-feasibility report has been submitted. Similarly, pre-feasibility resources under 221 & 22 category have been reported as feasibility resources. The resources shall be drilled down into the reserves & resources strictly as per the norms of UNFC with all relevant supporting documents i.e feasibility & pre-feasibility report. The geological plan & sections shall clearly show the correct UNFC code.
9. The reserves established shall also be drilled down on the basis of level-wise & section-wise basis both with due backup for the calculations. The exact grade obtained shall be spelled about in the final table of reserves & remaining resources.
10. The proof of the expenditure incurred while carrying out the exploration duly supported with the invoices to be enclosed.
11. Copy of all the notices served upon before commencement of the drilling and the borehole logs in the format to be enclosed duly signed by the Geologist of the mine and as per the prescribed format of MCDR.
12. Para 1.0(i): The complete lease area should be proposed under the plan period to cover under exploration to quantify reserves/ resources with cutoff grade corresponding to threshold value suggested by IBM within one year plan period as per Rule 12(4) of MCDR 2017.
13. Proposed exploration are not adequate and additional exploration has to be proposed in working pit also to know the existence of mineral as well as its UNFC compliance has to be planned. Core boreholes have to be planned based on type of deposit and various intrusion etc. As per Minerals (Evidence of Mineral Contents) Rules 2015, proposed borehole spacing along strike may be kept 50m or closer interval.
14. Para 1.0(j): The area under G-1, G-2, G-3 and G-4 may be given in a tabular form based on the exploration carried out in the past.
15. Date of Reserves estimated in approved plan is 20.07.2018 and date of Reserves estimated in draft submitted plan is 07.05.2021, in between the above said period, the lessee has excavated more than 1,50,000 tons of Iron Ore. Whereas reserves is decreased 1.280 million tons to 1.170 million tons only. Hence it needs to be explained.
16. The submitted document indicates that iron ore above 45% Fe exists within the ML area as per the thresholds of IBM. But, the resources have been estimated only above 50% Fe in the report. Again, in the use of mineral chapter it has been reported that iron ore from this mine is sold below -45%
17. Without single Boreholes, section has drawn and ore is considered as G-1, as per Minerals (Evidence of Mineral Contents) Rules 2015, it has to consider as resources only. Based on the Quarry depth reserves cannot be estimated. Therefore additional exploration by the way of Core drilling has to be proposed upto depth of mineralization.
18. UPL has to proposed upto proved depth only. No extrapolation of extreme depth has to be considered for estimation of reserves & resources. Beyond & below the depth of quarry, it should be considered as resources as per above said rule.
19. Geological reserves & Resources have to be shown in table to compare as per previous approved plan and as of now. Addition or depletion of reserves/ resources to be explains.
20. Para 1.0(k): An attempt may be made to prepare slice plans for estimation of reserves & resources due to complex deposit with intrusion and shape of the mineralised zone etc.

Mining:

1. Production planning is silent on grade of ore to be produced, cut-off grade for sale of ore, reject generation and its stacking. Nature of waste and mineral reject describing the lithology has not been mentioned. Need to furnish the same.
2. The reasons for modifications are not convincing from 74,000 tons to 3,00,000 tons of expansion within broken area without increasing the logistics and infrastructure. It is to be stated clearly in the introduction about the carry capacity etc.
3. Present pit dimension with length, breadth, RL, depth, benches in Ore & waste has to be shown in table format for all the existing pits & dump area. Number of Dumps/ stocks of waste, Sub grade/ mineral reject, processed ore lumps, fines etc with size of each dump i.e. L X W X H and total quantity of waste material in the dumps for recovery of salable grade iron ore, if any in future and its basis has to be given. Dump recovery should be based on scientific data through trench/pit sampling at closer interval and accordingly additional exploration has to be proposed for future proposal of dump mining, if any.
4. In the approved mining plan, 15% of fines below 45% Fe are planning to backfill the ore exhausted pits. So far how much quantity has been generated and backfilled or dumped. Whether any proposal for re-handling the materials to explain.
5. Production and development plan proposal has been shown for 2021-2022, already two months has passed in 2021-2022. So based on that proposal may revise as per available sources, for the remaining period of the mining plan production & development should be proposed.
6. During this proposed plan period there is no proposal to re-handle the dump during 2019-20 & 2020-21. But in the annual return 2019-2020, dump working of 24302 tons has been shown. Old Dump-9 has been reduced when compare with approved plan.
7. Topsoil Dump-2 has shown height of 0.5m in approved plan whereas in the recent surface plan it is 10m height.
8. The working proposal is very difficult to mine under safety aspects, during inspection it was noticed that seasonal nalla is flowing towards eastern side of puja pit and present Mining proposal has been proposed nearer to nalla, hence it should explain the water penetration and safety measures taken during the rainy season. 50m safety barrier has to be given for nalla.
9. As per conceptual land use pattern, 0.3528 hectares are available for mineral storage, but it is not discussed whether mineral stocks will be existing after lease is expiry or not.
10. Overall, the entire chapter on geology, mining & its management shall be re-written after clear re-establishment of the geological resources, followed with the respective study carried out to drill down the resources, table of grade-wise material handling on yearly basis till conceptual stage, re-calculation of the machinery required, dump/ waste management etc.
11. A table shall be separately enclosed in the text clearly indicating the lateral & depth extents of development & production carried out with geo-extents and bench configuration along with the backup calculation for the production quantity envisaged.

Mine drainage:

1. Mine is having large catchment area and substantial quantity of rain water flowing through the lease area. However, adequate rainwater management plan i.e. drainage plan along with arrangement for arresting solid wash off is not incorporating with engineering details & material to be used for its erection/ construction. Accordingly, Proposals should be incorporated in this document in view of environmental protection.
2. Minimum and maximum depth of water level is not given based on own monitoring of nearby wells and water bodies or based on studies/ publications of CGWB/ SGWB.
3. Ambiguous statements are used for different sub-para of mine drainage i.e. minimum and maximum depth of water level, quantity & quality of water likely to be encountered (seepage as well as discharge), pumping capacity and Regional & local drainage pattern.

Stacking of Topsoil, Mineral Reject and Disposal of waste:

1. Existing rehabilitation and protective measures taken around backfilled area like Retaining Wall, Garland Drain, Check Dams, Settling tanks, plantation etc. around proposed waste dump along with reclamation & rehabilitation measures, to be given year wise in quantified terms.
2. Dumping should be in such a manner that ore dump should not be mixed with waste. It has noticed that ROM and fines ore has been stocked on backfilled area.

Use of mineral and mineral reject:

1. Proposal to recover the 15% fine salable mineral from ROM is planned; but physical and chemical property of waste/ reject material lying in dumps has to be defined for future recovery of salable mineral, if any.

Processing of ROM and mineral reject:

1. Material balance chart shown that 85% of processed ore will be +57 Fe%, but in the annual return of 2019-2020 shows entire 90% of processed ore is below +55 Fe%.
2. As per finished produced after screening is 35% lumps and 65% fines, whereas in the annual return of 2019-2020 show 70% lumps and 30% fines, needs to explain.

PLATES:

1. Key plan:- Land use pattern i.e. forest, waste land, agriculture land etc is not shown as per rule 32(5)(a) of MCDR 2017. The prominent features existing in core and buffer zone to be shown. The co-ordinates of lease area and grid interval of the toposheet are not matching. Lease area should be bounded by all sides showing latitudes and longitudes of extreme four points. The submitted key plan doesn't indicate the ML area, adjoin MLs, wind rose, AAQ & other monitoring stations, signature of surveyor etc. the same needs rectification. The softcopy of the key plan has not been submitted.
2. Cadastral lease map has to be certified from competent officer of state forest department for extent of forest land or copy of forest clearance approved from MOEFCC has to be enclosed.
3. DGPS Plan: the copy of DGPS plan duly authenticated by state government is not submitted. As per CCOM circular no.2/2010, DGPS map shall be superimposed on Geo-referenced vectorised cadastral map is not enclosed. The boundary pillars along with co-ordinates value should be mentioned and authenticated by competent authority of state Government.
4. As per Rule-35(2) of MCDR, 2017, high resolution satellite images obtained from CARTOSAT-2 satellite LISS-IV sensor on the scale of cadastral map, covering the mining lease and an area of 500 meters from the lease boundary, should be submitted along with the document.
5. Surface Plan: RL differences is there, when compare to previous approved plan, i.e. Borehole DTH-17 is on 485m RL as per approved plan and as on date it is 482m RL. Date of survey i.e.26.02.2021 is too old and needs updation. Dump ID should be uniform in both plan & text.
6. The surface plan still indicates the surrendered area. If the area has already been surrendered to the satisfaction of the State Govt. the same need not to be shown in the surface plan. The surface plan shall be updated as per the extant rules under 32 (1)(a) of MCDR 2017.
7. Surface Geological Plan & sections: Geological plan & section should be drawn based on recent exploration has been carried out. UNFC codes are not marked in Geological plan & sections. Sub surface resources can't be projected on plan under UNFC category. UNFC codes have to be described in text also. All boreholes should be marked with type, diameter, inclination, collar level and depth. Boreholes above pit bottom must be shown by hatched lines in sections. All sections Lateral and vertical extrapolation of maximum 25% beyond the borehole is allowed for G-1/G-2 category; accordingly all the sections may be modified for showing UNFC reserves category. Few sections are having only 2 boreholes and few sections have no boreholes, however category G-1 is consider for reserves. Few boreholes are projected in two sections and having different lithology. Geological plan and sections are mismatching, i.e, Puja pit shown as Soft laminated iron ore with blue dust in plan but in section it mentioned as Lateritic Iron ore.

8. The surface geological plan & section shall be updated strictly as per the scrutiny furnished at Sl.No. 6. Hypothetical statements while designing the pits has been stated. It has been stated that the benches are of 6m height & 7.2m width with a bank slope angle of 60 deg. All the benches as shown in the drawing do not indicate such bank slope angle moreover a bench width of 6m has been taken for designing the UPL. Mis-representation of facts & figures has been observed. The same to be corrected in both text & all the relevant plans & sections.
9. Production and Development planning: Proposal of plantation, check dams, retaining wall, drainage channel, dump rehandling etc may also be included on the year-wise plan & sections. Section should be drawn as per Geological Section. Other scrutiny comment given in text has to be suitably reconciled.
10. Year wise development should bring about the earlier stage in a lighter shade and the proposals in a darker shade. Proposals as written like as per present EC etc should be clearly avoided. It should indicate only the present along with the proposal. The year wise development sections shall incorporate all the corrections as envisaged in the geological sections in this scrutiny. The correct UNFC code shall be clearly represented in these sections.
11. Conceptual Planning: Conceptual Mine plan upto the end of lease period has to be prepared on the base geological plan and sections considering the present available reserves and resources by showing the excavation, disposal of waste, backfilling of voids, reclamation and rehabilitation, afforestation etc. Conceptual section has been repeated. Longitudinal and transverse sections are required in support of conceptual planning.
12. The hypothetical conceptual plans & sections indicate clearly mining of the underlying waste at UPL stage but no waste generation has been reported alongwith no plans for its management. Similarly, if the waste in the contact zone are projected to be consumed no dilution factor has been considered. Therefore the submitted conceptual pit plan & sections drawn shall clearly indicate the compliance of scrutiny as mentioned in the geological sections and reproduced in the text & plates accordingly in the relevant chapters.
13. No litho-contacts need to be shown in the reclamation plan. It shall clearly bring about the efforts/ measures proposed for management of the benches, dumps alongwith the monitoring of the AAQ stations, water quality monitoring stations, noise & soil quality monitoring stations. A table shall be enclosed citing all the above details. The details of construction of the protective measures envisaged viz. retaining wall, garland drain, check dams etc shall be clearly indicated in the text with typical sections of its design. The drainage network shall be clearly indicated with direction of flow alongwith protective measures. Year-wise plantation proposed & carried out shall be clearly delineated and depicted in the text.
14. A solid waste disposal plan shall also be made based on the scrutiny comments offered in the chapter on conceptual plan & its sections.
15. The environment plan shall be clearly about as per rule 32(5) of MCDR 2017 duly covering the 500m all around the lease.
16. Financial Assurance plan: Different colour code has to used for pit, infrastructure, mine road, backfilling etc by showing outlines of the existing working pits, dumps, mineral stacks, roads, virgin unused area etc covering all the items under the financial assurance table as on 01.04.2021 and at the end of plan period for the purpose of computation of the areas required to be used in that period to verify the financial assurance. Table showing area considered for financial assurance under different activities should be given. In the FA only the present & future land use shall be indicated clearly delineating with proper colour code, the present & future land requirement under different working heads.
17. Signature of Lessee, Mines manager & Geologist are missing in few plan. The mine surveyor shall sign all the statutory plans and a copy of his certificate to be enclosed.

Annexure:-

1. The clear and legible Xerox copy to be enclosed for all annexures.
2. All the annexure to be properly indexed/numbered/paged and signed by the TQPs.
3. The copy of original valid BG of requisite amount should be submitted in the form of annexure along with original.
4. A copy of the AAQ, water quality, noise & soil quality reports from a NABL lab. To be supported in respect of the previous year and seasonwise.

