Deputy Director General of Forests (C),
Ministry of Env., Forest and Climate Change,
Integrated Regional Office,
A/3, Chandrasekharpur,
Bhubaneswar – 751023
Email: roez.bsr-mef@nic.in

MD/ENV/ 1294/106 / 2024
Date: 27.11.2024

Ref: Environmental Clearance letter no. J-11015/888/2007-IA. II (M), dated: 21.12.2011 & its amendment dated 7th September 2018.

Sub: Submission of Half-yearly compliance status report of Environmental Clearance conditions for the period April 2024 – September 2024 in respect of Khondbond Iron & Manganese Mine, M/s Tata Steel Limited.

Dear Sir,

Kindly find attached herewith the half-yearly compliance status report in respect of the stipulated Environmental Clearance conditions of Khondbond Iron & Manganese Mine, M/s Tata Steel Limited for the period from **April 2024 – September 2024.** Also, the compliance for the same period vide office memorandum no. Z-11013/57/2014-IA. II (M), dated 29.10.2014, is also attached herewith as Annexure - A.

We trust that the measures taken towards environmental safeguards comply with the stipulated environmental conditions. We look forward to your further guidance which shall certainly help us in our endeavor for further improve upon our Environmental Management practices.

Thanking you,

Yours faithfully,
f: M/s Tata Steel Limited

Chief (Mine planning & Projects), OMQ

Encl.: As above

Copy to : The Chairman, Central Pollution Control Board, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700107 (W. B.)
: The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilakantha Nagar, Unit – VIII, Bhubaneswar – 751012 (Odisha)
: The Regional Officer, SPCB, College Road, Baniapata, Keonjhar – 758001 (Odisha)

TATA STEEL LIMITED
Mines Division Noamundi 833 217 India
Tel 91 9234301340 Fax 91 6596 290737
Registered Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001 India
Tel 91 22 66658282 Fax 91 22 66657724
Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

Your (Half Yearly Compliance Report) has been Submitted with following details	
Proposal No	IA/OR/MIN/9648/2007
Compliance ID	72538728
Compliance Number(For Tracking)	EC/M/COMPLIANCE/72538728/2024
Reporting Year	2024
Reporting Period	01 Dec(01 Apr - 30 Sep)
Submission Date	29-11-2024
RO/SRO Name	ARTATRANA MISHRA
RO/SRO Email	jhk109@ifs.nic.in
State	ODISHA
RO/SRO Office Address	Integrated Regional Offices, Bhubaneswar
Note:- SMS and E-Mail has been sent to ARTATRANA MISHRA, ODISHA with Notification to Project Proponent.	

Point wise compliance Environmental Clearance
of
Khondbond Iron and Manganese Mine Tata Steel Ltd.
EC no J-11015/888/2007. IA. II (M), dated 21st Dec. 2011 and its amendment dated 7th Sept.2018
Production: Iron 08 MTPA (ROM) and beneficiation plant 08 MTPA and Manganese Mine 0.1MTPA (ROM)
(April 2024 – September 2024)

Sl No.	*EC Condition*	*Compliance status as on date*
Specific Conditions		
i.	No mining shall be carried out in the forestland without obtaining requisite prior forestry clearance under the Forest (Conservation) Act, 1980 for forestland involved in the project. The environmental clearance is subject to grant of forestry clearance.	Complied. The mining is restricted to only 453.150 ha. 136.15 ha broken prior to enactment of the Forest (Conservation) Act,1980 and mining in remaining 317ha started only after issuance of final order by the Govt. of Odisha vide letter no. F. No. 8-98/2004/FC dated: 09.08.2006 (317 ha. fresh + 136.15 ha broken prior to 1980) after prior approval from the Central Government vide letter no. F. No. 8-98/2004/FC dated: 09.08.2006. The total area of Khondbond has mine lease area of 978ha. Out of which the mine has obtained the Stage -II forest clearance of 453.150ha vide letter no. F. No. 8-98/2004/FC dated: 09.08.2006 (317 ha. fresh + 136.15 ha broken prior to 1980). All the mining operations are restricted within same. For the rest of area, forest diversion proposal is applied and are at advanced stage of approval.
2.	The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated therein.	Complied The Consent to Established was obtained from the State Pollution Control Board, Odisha vide letter no. 18102/IND-II/CTE-6725 dated 28.09.2022. The latest Consent to operate issued by letter no. 3570/IND-I-CON-1127 dated 11.03.2022 is valid till 31.03.2026.
3.	The environmental clearance is co-terminus to mining lease and the proponent shall obtain fresh Environmental Clearance at the time of renewal of mine lease in accordance with the provisions of the EIA Notification, 2006 as amended subsequently.	Will obtain fresh Environmental Clearance at the time of renewal of lease in accordance with prevailing laws at the time of making application.
4.	The mining operations shall be restricted to above ground water table in the iron ore zone and it should not intersect the ground water table. In case of working below the ground water table in the iron ore zone, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydrogeological study shall be carried out.	Noted and complied with. However, in iron mine, the lowest working depth of the mine is 630 RL which is above the ground water table 555AMSL - 553AMSL. But in manganese mine the ground water table has been breached during the life of mine for which dewatering NOC had been granted from CGWA vide letter no. CGWA/NOC/MIN/REN/1/2021/6494 and its second renewal is under process. A detailed Hydro-Geological study was submitted prior to obtaining NoC.
5.	The Company shall submit within 3 month their policy towards Corporate Environment Responsibility which should inter-alia address (i) Standard Operating process/ procedure to bring into focus any infringements/ deviation/ violation of environmental or forest norms /conditions, (ii) Hierarchical system or	Noted and complied vide letter No. MD/ENV/775 /106/2012, Dated. 20.03.2012. Tata steel Ltd. has various committee to address all the environmental issues adequately. (i) Standard Operating Procedures have been stipulated and is being followed stringently. (ii) An environment cell has been established with senior

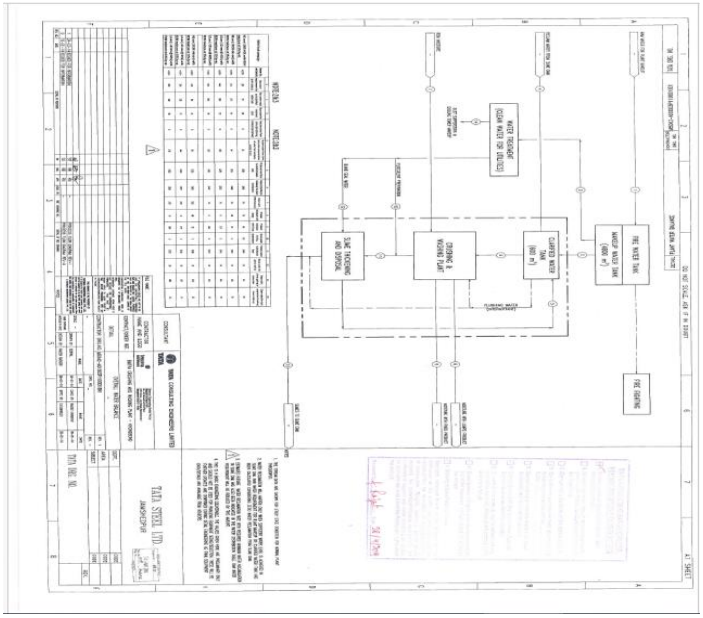
Manager (Environment)

	Administrative order of the company to deal with environmental issues and ensuring compliance EC conditions and (iii) System of reporting of noncompliance / violation environmental norms to the Board of Director of the company and/ or stake holders or shareholders.	leadership at apex to drive towards sustainability and to deal with environmental issues and ensuring compliance EC conditions. (iii) EVOLVE, an online system to monitor timely completion of compliance is utilized for tracking and reporting non-compliance / violation environmental norms to the Board of Director of the company and/ or stake holders or shareholders.
.6.	A safety zone of 50m shall be left as no mining zone and no waste shall be dumped within this safety zone along the side of Suna Nadi (Kundra Nallah) and the Kakrapani nallah flowing adjacent to the mine lease area.	Before this condition was given, there exists an old waste dump within the 50m distance from Kundra nallah and that has been stabilized by plantation along with garland drains and Toe walls. However, at present no mining activity is being carried out within the safety zone of 50m along the side of Kundra nallah. 
7.	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations. Adequate measures shall be taken for conservation and protection of the first order and the second order streams, if any emanating from the mine lease area during the course of mining operation.	Complied with. No natural watercourse or water resources are obstructed due to our mining operations. Further, no first order and the second order streams are emanating from the mine lease area.
8.	The top Soil, if any shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	Noted and complied. An area of 0.50 ha has been identified for storage of topsoil. Topsoil that is generated is used for plantation of saplings and vetiver plantation. 
9.	The project proponent shall carry out conditioning of the ore with water to mitigate fugitive dust emission, without effecting flow of ore in the ore processing and handling areas.	Noted and complied. The 8 MTPA Processing plant is equipped with adequate number of dust suppression systems along the conveyor belt system and transfer points.  *Dry fog system and closed conveyors of Beneficiation plant* A waterless dust extraction system has been installed at conveyor belts for controlling fugitive dust emission. 

Manager (Environment)

		The Crushing and Screening Plants are also equipped with dust suppression systems to reduce fugitive dust.  *Dust Suppression system at Transfer points*
10.	The effluent from the ore beneficiation plant shall be treated in the tailing thickener and the tailings slurry shall be transported through a closed pipeline to the tailing ponds.	Noted and complied. The effluent from the ore beneficiation plant is first sent to High-Rate thickener where the excess water is recovered and re circulated into the plant for processing purpose and the remaining slurry with tailing is then sent for final disposal of the slime in the tailing dam through closed pipeline.  *High-Rate Thickener*
11.	The tailing ponds shall be lined HDPE lining.	Noted and complied. HDPE liners have been installed in the slime Dam.  *Tailing Pond*
12.	The decanted water from the tailing dam shall be re-circulated and there should be zero discharge from the tailing dam.	Noted and complied.

Manager (Environment)

		The decanted water from the tailing dam is recovered and re-circulated in the processing plant. High-rate thickener is utilized for  increased re-circulation of water from slime and reduce freshwater dependability.
13.	Appropriate technology shall be used for maximum recovery of ore in order to reduce slurry discharge and to increase the life of the tailing ponds	Noted and shall be complied. A High-rate thickener has been installed. It works on the principle of removal of excess water from slime getting generated during Beneficiation process.  High-Rate Thickener
14.	The project proponent shall constitute on emergency management Team under the control of project in charge to deal with the emergency situation pertaining to the tailing pond for the timely and effective control of emergency situation, it shall be ensured that training programme and mock drill shall be organised for the employees	Noted and complied. Emergency management team which consists of security personnel's do continuous patrolling of the area for observation of any emergency pertaining to the tailing ponds. Also, mock drills are organised for the employees for control of emergency situation in regard with tailing dam.
15.	The Over burden (OB) generated during the mining operations shall be stacked at earmarked dump site (s) only and it should not be kept active for a long period of time and its phase-wise stabilisation shall be carried out. Backfilling shall commence from the fifth year onwards. There shall be six over burden (four for iron and two for manganese ore). proper terracing of the OB dumps shall be carried out so that the overall slope of the dumps shall be maintained to 28°. The overburden dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall	Currently all Over burden (OB) is being handled as per approved mine plan. The land use and land cover shall be abided which includes the earmarked storage of OB. Total backfilling for FY24 – 1.01Ha and FY 25 0.62 Ha (till date). OB dumps are scientifically being vegetated with suitable native species. Total number of plantations for FY 25 is 6303 upto date covering an area of 2.52 Ha.

Manager (Environment)

	be undertaken for stabilization of the dump. Out of the total excavated area of 763.665ha, an area of 758.665 ha shall be reclaimed and afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self- sustaining. Compliance status shall be submitted to the Ministry of Environment and Forest and its regional office located at Bhubaneswar on six monthly basis.	 *Plantation of saplings at OB dumps* Also, coir matting has been made in some fine stock yards and subgrade dumps. The pictures of which is attached.  *Coir Matt at Sub Grade dumps*
16.	Catch drains and siltation ponds of appropriate size should be constructed around the tailing ponds, mine working, soil, OB and mineral dump(s) to prevent run off of water and flow of sediments directly into the Suna Nadi (Kundra Nalla), the Jalpa Nadi, the Baitarni River, the Karo Nadi, the kakrapani nalla, the kundru nalla, the Dalko nalla, the kashi nalla, the Tapodihi nalla, the Teherei nalla, the Achanda nalla and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after the monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed around the tailing ponds, mine pit, soil, OB and mineral dump(s)to prevent run off of water and flow of sediments directly into the Suna Nadi (Kundra Nalla), the Jalpa Nadi, the Baitarni River, the Karo Nadi, the kakrapani nalla, the kundru nalla, the Dalko nalla, the kashi nalla, the Tapodihi nalla, the Teherei nalla, the Achanda nalla and other water bodies and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.	Catch drains, siltation ponds are made along with toe wall and garland drains in and around mine dumps areas to prevent surface runoff. The catch drains are constructed based on peak sudden rainfall data along with 50% safety margin to prevent overflow of any kind. Timely cleaning and de-siltation of these check dams and siltation ponds are done prior to monsoon for checking flow of sedimentation.  *Siltation pond and catch drains in iron mines area*

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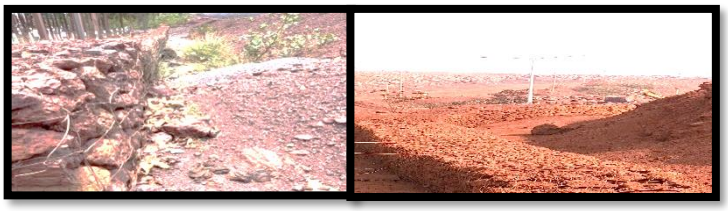
		A series of check dams and siltation's ponds are also made in manganese area.  *Siltation pond and catch drains in Mn mines area*
17.	Dimension of retaining wall at the toe of the OB dumps and benches within the mine to check run-off and siltation should be based on the rainfall data.	All the retaining walls at the toe of OB dumps are made adequately. All the siltation ponds and garland drains are made based on rainfall data for adequate surface runoff management.  *Retaining wall in Khondbond mines area*
18.	The void left unfilled in an area of 5ha shall be converted into water body. The higher benches of excavated void/ mining pit shall be terraced, plantation done to stabilize the slopes. The slopes of higher benches shall be made gentler for easy accessibility by local people to use the water body. Peripheral fencing shall be carried out all along the excavated area.	Noted and shall be complied at end of mine life. This being the activity at the end of mine life has been incorporated in progressive mine closure plan.
19.	Plantation shall be raised in an area of 965.018 ha including a 7.5 wide green belt in the safety zone around the mining lease by planting the native species around reclaimed area, mine benches, water body, tailing ponds, along the roads etc. In consultation with the local DFO/Agriculture Department. The density of the tree should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	Noted and being complied. Plantation in safety zone is done with native species of plants. Total number of plantation for FY 25 is 6303 upto date covering an area of 2.52 Ha. 

Manager (Environment)

		Additionally, a 0.08 ha plot with Miyawaki Plantation and 200 nos. of Sal plantation been done for biodiversity conservation.  *Sal Plantation on dumps and Miyawaki Plantation*
20.	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer point. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Noted and being complied. Regular water sprinkling is being carried out by use of mobile water sprinklers around the crushing and screening plant, loading and unloading area and haul roads. Regular monitoring of ambient air quality is being done and the results are within the permissible limits as prescribed by the Central Pollution Control Board. Fog cannons are being used for arresting fugitive dust emissions. Also, the wet plant is equipped with dry fog system for control of dust emission.  *Fixed and Mobile water sprinkling*  *Dust Suppression system at Transfer points* Regular Ambient Air Monitoring is being done through three Nos. of CAAQM stations installed at strategic locations of mines. The data is being continuously shared with Pollution Control Board on real time basis.
21.	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintained.	Noted and complied. Regular monitoring of Kundra Nallah is being carried out and records are maintained.
22.	The project authority should implement suitable	Noted and complied.

Manager (Environment)

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<tr>
<td></td>
<td>conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.</td>
<td>Four nos. of Rainwater Harvesting Ponds and Two nos. of Ground Water Recharge structures have been constructed after conducting a hydrogeology study. The water recharge potential of the RWH structures are as follows: -
<table>
<tr><th>Sl. No.</th><th>RWH Structure</th><th>Numbers</th><th>Recharge Quantity (m3)</th></tr>
<tr><td>1.</td><td>Ground water structure</td><td>4</td><td>66000</td></tr>
<tr><td>2.</td><td>Recharge Well</td><td>2</td><td>34560</td></tr>
<tr><td></td><td>Total</td><td></td><td>100560</td></tr>
</table>

Rainwater Harvesting structures at KIMM


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<tr>
<td>23.</td>
<td>Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The periodic monitoring (at least four times in a year – pre-monsoon (April/May), monsoon (August), post-monsoon (November) and winter (January) once in in each season) shall be carried out in consultation with the State Ground Water Board/ Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity, necessary corrective measures shall be carried out.</td>
<td>Noted and complied.

Regular ground water level with quality as per defined frequency is being submitted to CGWA.

Network of observation borewells has been made as per CGWA guidelines for Ground water level monitoring.</td>
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<tr>
<td>24.</td>
<td>The ground water quality around the tailing pond shall be monitored regularly and time series data generated. It shall be ensured that the groundwater quality is not affected adversely due to the project.</td>
<td>Noted and complied.</td>
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<tr>
<td>25.</td>
<td>The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water required for the</td>
<td>Noted and complied.</td>
</tr>
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Manager (Environment)

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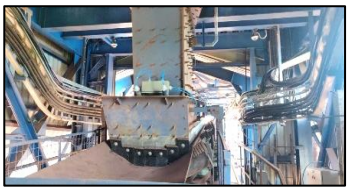
<tr><td></td><td>project.</td><td>The mine has valid surface water drawl permission of 19020 KLD from water resource division vide letter no 3300, dated: 11.02.2016.</td></tr>
<tr><td>26.</td><td>Appropriate mitigative measures should be taken to prevent pollution of the Baitarni River, the Suna Nadi and the Karo Nadi in consultation with State Pollution Control Board.</td><td>Noted and complied.
To prevent pollution of surrounding rivers during rains, all the mitigative measures are taken such as toe wall, garland drains, check dams, settling pits etc.
    </td></tr>
<tr><td>27.</td><td>The Project proponent shall practise suitable rainwater harvesting measures on long term basis and work out a detailed scheme for rainwater harvesting in consultation with the Central Ground Water Authority and submit a copy of the same to the MoEFCC and its Regional Office, Bhubaneswar.</td><td>Four nos. of Rainwater Harvesting Ponds and Two nos. of Ground Water Recharge structures have been constructed after conducting a hydrogeology study.
The water recharge potential of the RWH structures are as follows: -
<table><tr><th>S. no.</th><th>RWH structure</th><th>Numbers</th><th>Recharge Quantity(m^3)</th></tr><tr><td>1.</td><td>Ground Water Recharge structures.</td><td>4</td><td>66000</td></tr><tr><td>2.</td><td>Recharge Well</td><td>2</td><td>34560</td></tr><tr><td></td><td></td><td>Total</td><td>100560</td></tr></table></td></tr>
<tr><td>28.</td><td>Vehicular emission shall be kept under control and regular monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded</td><td>Noted and complied.

PUC for checking of emission for all the vehicles are carried out once in every six months. Moreover, outside transportation of mineral is carried out through tarpaulin covered trucks after passing through Wheel washing system at dispatch gate. Further, overloading of trucks is restricted to prevent spillage of material.</td></tr>
<tr><td>29.</td><td>No transportation of ore outside the mine lease area shall be carried out after sunset.</td><td>Transportation of ore is being made as per District Collector, Keonjhar, order.</td></tr>
<tr><td>30.</td><td>No blasting shall be carried out after sunset. Blasting operation shall be carried only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.</td><td>Blasting is being carried out during daytime only. Controlled Blasting is being carried out for control of ground vibrations and to arrest fly rocks, as per the recommendations of CIMFR, Dhanbad.</td></tr>
<tr><td>31.</td><td>Drills shall either be operated with Dust extractors or equipped with water injection system.</td><td>Wet drilling is practiced ensuring no fugitive dust emission takes place. Drills have been provided with dust injection system.
  </td></tr>
</table>

Manager (Environment)

		Wet drilling
32.	Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	The Mineral Handling plant has been equipped with dry fog system along with closed conveyor at all loading and unloading points including transfer points.   *Picture of dry fog system and closed conveyors of Beneficiation plant at Khondbond* A waterless dust extraction system has been installed at conveyor belts for controlling fugitive dust emission. 
33.	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	Khondbond Iron and Mn Mine does not have any colony. However, a Sewage Treatment Plant (STP) of 10 KLD installed and operational in mine area for the treatment of waste-water generated. Khondbond doesn't have any separate colony. Mine and for waste-water from workshop, oil and grease separation pits are provided. Effluent Treatment plant (ETP) of 7 KLD has been installed at workshop. Photographs are attached.     *10 KLD STP at Khondbond Iron and Mn Mine* *7 KLD ETP at Khondbond Iron and Mn Mine*
34.	During operation of the project, special emphasis shall be given to minimise risks and hazards due to manganese poisoning.	Noted and is being complied as directed. Medical tests were conducted for assessing the exposure to Mn poisoning for persons working in the Manganese Pit. Proper training was also provided to the people most vulnerable to manganese exposure.
35.	Pre-placement of medical examination and periodical examination of the workers engaged in the project shall be carried out and record maintained. For the purpose,	Complied Pre-placement medical examination and periodical

Manager (Environment)

	schedule of health examination of the workers should be drawn and followed accordingly.	examination of the workers engaged are being conducted and record maintained. The schedule of Periodical Medical Examination is once in every 3 years for the employees of age more than 40 years and once in 5 years for the employees of age less than 40 years.
36.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Noted and complied. During construction and other jobs at Khondbond, local labours are engaged, which are from nearby villages. Thus, residential facility is not required. However, various amenities such as canteens for food, a safe drinking water facility, toilets, medical facility with site medical officer etc are provided. A sewage treatment plant of 10KLD is also operational in area.
37.	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	Noted and complied. Digital processing of the entire lease area was carried by high resolution satellite imagery. M/s DCS Consultants, (Authorized organisation of ORSAC) was engaged for the work.
38.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna namely sloth bear, elephant, godhi etc. spotted in the study area. The critical habitats if any within the impact zone shall be individually identified and the conservation plan prepared specific to this project in consolation with the state forest and wildlife deptt. Should effectively address the same. All the safeguard measures brought out in the wildlife conservation plan prepared specific to this project site shall be effectively implemented in consolation with the state forest and wildlife deptt. A copy of approved wildlife conservation plan shall be submitted to the Ministry and its Regional office, Bhubaneswar within three months.	Noted and complied. Khondbond is an operational mining area of Tata Steel and various precautionary measures are taken for conservation and protection of endangered flora and fauna like Miyawaki Plantation, Sal Plantation, installation of Niche bird box at appropriate places etc. Additionally, multiple awareness sessions towards Environment Protection are carried out both internally and with the local populace. The mine has approved wildlife management 843/1 WLSSP-100/2016; dated 28th January 2016 and various measures are taken with state forest and wildlife department as and when required. The approved copy of wildlife management plan is already submitted to Ministry and its Regional office, Bhubaneswar.  *Environment Awareness sessions*
39.	The entire mining lease area shall be fenced by erecting solar power electric fencing all around it. The fencing so erected shall be maintained properly and the cost towards erection and maintenance of the solar power electric fencing shall be borne by the project proponent out of the project cost.	Noted and being complied. The Khondbond mine lease comprises of 875.198 ha of forest land including Sabik Forest. Area having surface right and forest clearance are being fenced with solar electric fence. Lease boundary of 4 km length has been successfully fenced.

Manager (Environment)

		 *Solar fencing around lease boundary*
40.	The critical parameters such as RSPM (Particulate matter with size less than 10 miocron i.e., PM10) and NOx in the ambient Air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored (TDS, DO,PH, and total suspended Solids (TSS). The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the company in public domain. The circular No. J20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	Noted and complied. The critical parameters like RSPM and NOx in ambient air are being monitored regularly. Peak particle velocity at the time of blasting is also monitored regularly at 300m distance as per rules of IBM. Quality of discharged water (TDS, DO, PH, and total suspended Solids (TSS) is also being monitored. All the environmental monitoring data is being uploaded on the Company's website as part of this report and displayed on a display board at the main entrance gate of the mine.  *Display of environmental information in public domain*
41.	A final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment and Forests 5 years in advance of final mine closure for approval.	A progressive mine closure plan approved by IBM is in place. The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment and Forests 5 years in advance.

Manager (Environment)

Sl No.	EC Condition	Compliance status as on date
General Conditions		
1.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.	There is no change in mining technology and scope of work mentioned while obtaining prior environmental clearance. No change in mining technology and scope of work will be undertaken without prior approval of the Ministry of Environment and Forests in future.
2.	No further expansion or modification in the plant shall be carried out without prior approval of the MoEFandCC.	There is no expansion or modification undertaken in the plant as mentioned while obtaining prior environmental clearance. For any expansion or modification in future prior approval shall be sought from MoEFandCC.
3.	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	Calendar plan (IBM Approved Mining Plan) prepared for the mine is being strictly adhered to and we are well within the limits specified in Mining Plan as well as EC and CTO granted capacity.
4.	At least four ambient air quality-monitoring stations should be established in the core Zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e. PM10) and NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Noted and complied. Ambient Air Quality monitoring is regularly carried out at four different stations within the core and buffer zone. Two continuous ambient air quality monitoring stations with PM_{10} and $PM_{2.5}$, CO, SO_2 and NO_x are installed in core zone and one at buffer zone.  *Continuous ambient air quality monitoring stations in Khondbond*
5.	Data on ambient air quality [(RSPM (particulate matter with size less than 10 micron i.e. PM10) and NOx] should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.	RSPM (Particulate matter with size less than 10micron i.e, PM10) and, NOx in ambient air are being monitored as per standard guidelines and the reports are submitted to Regional office, MoEFandCC, Bhubaneswar on half yearly basis and SPCB, Odisha on monthly basis.
6.	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Fugitive dust emissions from all the sources are controlled regularly. Effective water sprinkling is being done on haul roads, loading and unloading and at transfer points Dry fog system is being used in plant areas to avoid generation of fugitive dust.
7.	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc should be provided with ear plugs/muffs.	Regular noise monitoring is done at different work areas. High noise areas are earmarked and people working there are provided with ear protection equipment and the system is ensured by certification to ISO 45001 and regular field audits.
8.	Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated so as to conform to the Standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Oil and Grease separation pits have been provided to take care of effluents from the workshop. A 7KLD ETP has been installed at Equipment section as well. The same water quality is monitored regularly, and the parameters meet the prescribed standard. There is no waste-water generation from the mines.
9.	Personnel Working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be	Adequate dust masks are provided to employees engaged in dusty areas. It is also ensured that they use the same. Respirable dust survey at different locations is done regularly. The employees are also given regular awareness training on safety and health aspects as part of implementation process of ISO

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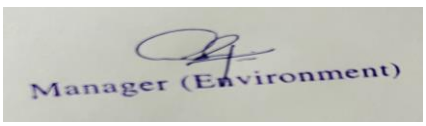
	undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	45001 systems. Further, employees undergo Lung Function Tests during the Periodical Medical Examination. Periodical Medical Examination of employees and contractor workers are organised regularly to observe any contractions due to exposure to dust and other occupational hazards.
10.	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive who will report directly to the Head of the Organization.	A separate environmental management cell is in place with the people having relevant qualification on environmental science. The Head of the environment department reports to General Manager i.e. the head of the organization.
11.	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.	Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. During the year FY 24-25 an amount Rs. 629.31 lakhs (approx..) has been allocated for environment protection and it is being spent towards environmental protection measures at Khondbond.
12.	The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closing and final approval of the project by the concerned authorities and the date of start of land development work.	This is a running mine. No specific date of start of land development work can be assigned. However, the copy of the Environmental Clearance has been sent to the Regional Office, MoEFandCC, Bhubaneswar for kind information.
13.	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the Officer (s) of the Regional office by furnishing the requisite data / information / monitoring reports.	We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, information and monitoring reports.
14.	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent	Six monthly reports are submitted regularly on the status of implementation of the stipulated environmental safeguards to the Regional Office, MoEFandCC, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board. Further, the six-monthly compliance report along with the monitoring results are uploaded in Tata Steel's website and updated periodically.



Point wise compliance Environmental Clearance Amendment
of
Khondbond Iron and Manganese Mine Tata Steel Ltd.

EC no: J-11015/888/2007.IA.II (M), its amendment dated 7th Sept.2018
Production: Iron 08 MTPA (ROM) and beneficiation plant 08 MTPA and Manganese Mine 0.1MTPA (ROM)

Sl No.	EC Condition	Compliance status as on date
Specific Conditions		
1.	The Environmental Clearance will not be operational till such time the project proponent complies with all the statutory requirements and judgement of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition(Civil)No.114 of 2014 in the matter of common cause verses Union of India and Other's.	Noted and being complied The unit is committed for the statutory compliance of all the requirements and judgement of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil)No.114 of 2014 in the matter of common cause verses Union of India and Others.
2.	Department of Mining and Geology state govt shall ensure that mining operation shall not commence till the entire compensation levied, for illegal mining paid by the project proponent through their respective department of mining geology in strict compliance of judgement of Hon'ble Supreme Court dated the 2nd August 2017 in Writ petition(Civil) No. 114 of 2014 in the matter of common cause versus union of India and Ors.	Noted.
3.	Monitoring of ambient air quality to be carried out based on the 2009 notification, as amended from time to time by the central pollution control board	Noted and complied.
4.	The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicles with PUCC only will be allowed to ply. The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Project should obtain PUC certificate for all the vehicles from authorized pollution testing centre; washing of all transport vehicle should be done inside the mining lease.	Complied. The transportation of ore is done with compliance to all the conditions stated in order to prevent pollution. Regular sprinkling is done. PUC certificates are being obtained for vehicles in the mining lease.
5.	The activities and budget earmarked for Environmental Responsibility (CER) shall be as per Ministry's O.M No. 22-65/2017-IA.II(M) dated 01.05.2018 and the action plan on the activities proposed under CER shall be submitted to the Regional Office of the Ministry and State Pollution Control Board.	Khondbond mine has Environment Clearance for a production capacity of 8 MTPA Iron ore and 0.1 MTPA Mn ore obtained vide letter no. J-11015/888/2007-IA-II (M), dated 21.12.2011. The mine was granted an amendment in EC w.r.t Run of Mine (ROM) on 07.09.2018. This amendment was necessitated for consideration of new definition of ROM as per notified Mineral (Other than Atomic and Hydrocarbons Energy Minerals) Concession Rules 2016. There was no proposal for production enhancement or modernization or change in technology therefore no capital expenditure was involved. As per the Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018, CER cost is a percentage of capital cost. Whereas for the EC granted on 07.09.2018, no capital expenditure was involved. Therefore, we had not considered any CER budget cost post grant of the EC dated 07.09.2018.

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		Further as per Ministry's O.M No 22-65/2017-IA. II (M) dated 30.09.2020, the allocation of funds under CER is no more applicable. We wish to state here that the mine has been implementing the various EMP measures and developmental activities under CSR heads on a regular basis.

Manager (Environment)

ANNEXURE-XII

Summarised Ambient Air Quality Monitoring Report								
Khondbond Iron & Manganese Ore Mine of M/s Tata Steel Limited								
Period: April 2024 to September 2024								
Mine location	**Sampling location**	**Month**	**Range**	**Results in µg/m3**				
				PM10	**PM2.5**	**SO2**	**NOx**	**CO**
Khondbond Iron & Manganese Ore Mine	Near Pit-3	Apr 24	Avg.	64.6	24.2	11.9	21.4	BDL (DL-0.5)
		May 24	Avg.	65.1	27.4	12.3	23.1	BDL (DL-0.5)
		Jun 24	Avg.	60.2	22.7	10.5	20.6	BDL (DL-0.5)
		Jul 24	Avg.	49.6	18.0	9.6	18.1	BDL (DL-0.5)
		Aug 24	Avg.	56.8	23.0	11.3	21.0	BLQ (LOQ-0.5)
		Sep 24	Avg.	53.6	21.6	12.0	22.3	BLQ (LOQ-0.5)
	Manganese Mine	Apr 24	Avg.	68.9	26.3	11.4	23.3	BDL (DL-0.5)
		May 24	Avg.	67.9	23.9	11.1	19.9	BDL (DL-0.5)
		Jun 24	Avg.	60.1	21.5	11.8	22.9	BDL (DL-0.5)
		Jul 24	Avg.	53.5	19.8	10.3	19.2	BDL (DL-0.5)
		Aug 24	Avg.	58.4	21.0	12.0	21.6	BLQ (LOQ-0.5)
		Sep 24	Avg.	57.0	22.4	12.5	23.8	BLQ (LOQ-0.5)
	Near 16-D	Apr 24	Avg.	64.2	22.8	11.2	21.5	BDL (DL-0.5)
		May 24	Avg.	61.9	20.4	11.4	20.6	BDL (DL-0.5)
		Jun 24	Avg.	59.8	20.5	10.9	21.5	BDL (DL-0.5)
		Jul 24	Avg.	51.6	18.5	11.2	20.9	BDL (DL-0.5)
		Aug 24	Avg.	54.3	18.6	10.1	20.2	BLQ (LOQ-0.5)
		Sep 24	Avg.	50.5	19.4	11.6	21.0	BLQ (LOQ-0.5)
	Security Barrack	Apr 24	Avg.	68.6	21.2	10.9	22.0	BDL (DL-0.5)
		May 24	Avg.	64.2	21.6	11.1	20.4	BDL (DL-0.5)
		Jun 24	Avg.	62.2	23.7	11.0	21.9	BDL (DL-0.5)
		Jul 24	Avg.	54.8	22.4	10.8	21.5	BDL (DL-0.5)
		Aug 24	Avg.	57.3	24.5	12.0	21.4	BLQ (LOQ-0.5)
		Sep 24	Avg.	56.7	22.5	10.5	20.6	BLQ (LOQ-0.5)

GROUND WATER QUALITY REPORT (APRIL 2024 TO SEPTEMBER 2024)
KHONDBOND IRON & MANGANESE MINE
MAY 2024

	Parameter	Ganua Village (Mr. Keshar Patra)	Guruda Village (Nr. Club)	Guruda Village	Khondbond Village (Mr. Mothua Munda)	OMC Colony
I	**Biological Testing 1.Water**					
1	*Escherichia coli*	Absent	Absent	Absent	Absent	Absent
II	**Chemical Testing 1 .Water**					
2	Total Alkalinity (as Calcium Carbonate)	181.36	137.68	173.68	163.29	168.96
3	Anionic Detergents (as MBAS)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
4	Colour	1	1	1	1	1
5	Cyanide (as CN)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)	BDL (DL – 0.005)
6	Chloride (as Cl)	32.58	28.46	21.37	16.57	17.31
7	Calcium (as Ca)	46.17	52.61	51.29	54.19	56.29
8	Free Residual Chlorine	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)	BDL (DL - 0.1)
9	Fluoride (as F)	0.21	0.17	0.37	0.18	0.27
10	Magnesium (as Mg)	12.35	13.52	13.71	12.57	9.53
11	Nitrate (as NO_3)	9.36	7.93	8.92	13.61	6.91
12	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
13	pH	6.73 at 25°C	7.16 at 25°C	6.73 at 25°C	7.18 at 25°C	6.81 at 25°C
14	Phenolic compounds (as C_6H_5OH)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
15	Sulphate (as SO_4)	13.58	8.27	13.52	6.93	6.94
16	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
17	Total dissolved solids	451	461	467	453	473
18	Turbidity	0.3	0.2	BDL (DL – 0.1)	0.7	0.2
19	Total hardness (as $CaCO_3$)	166.14	187.05	184.53	187.10	179.86
II	**Chemical Testing 2. Residues In Water**					
20	Arsenic (as As)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
21	Aluminium (as Al)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
22	Barium (as Ba)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
23	Boron (as B)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
24	Copper (as Cu)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
25	Cadmium (as Cd)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)	BDL (DL - 0.002)
26	Iron (as Fe)	0.17	0.16	0.17	0.17	0.27

GROUND WATER QUALITY (APRIL 2023 TO SEPTEMBER 2023)
KHONDBOND IRON & MANGANESE MINE
MAY 2024

	Parameter	**Ganua Village (Mr. Keshar Patra)**	**Guruda Village (Nr. Club)**	**Guruda Village**	**Khondbond Village (Mr. Mothua Munda)**	**OMC Colony**
27	Lead (as Pb)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)	BDL (DL - 0.01)
28	Manganese (as Mn)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)	BDL (DL – 0.02)
29	Mercury (as Hg)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)	BDL (DL - 0.001)
30	Selenium (as Se)	BDL (DL- 0.01)	BDL (DL- 0.01)	BDL (DL- 0.01)	BDL (DL- 0.01)	BDL (DL- 0.01)
31	Total Chromium (as Cr)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
32	Zinc (as Zn)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)	BDL (DL - 0.02)
33	Polynuclear aromatic hydrocarbon (PAH)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)
34	Mineral Oil	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)	BDL (DL – 0.001)
II	**Pesticide Residues Organochlorine**					
i	Alpha-HCH	BDL (DL - 0.01)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
ii	Beta HCH	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
iv	Delta- HCH	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
v	Alachlor	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
vi	Aldrin	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
vii	Dieldrin	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
viii	Butachlor	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
ix	p,p´-DDE	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
x	o,p´-DDE	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xi	p,p´-DDD	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xii	o,p´-DDD	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xiii	o,p´- DDT	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xiv	p,p´- DDT	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xv	Monocrotophos	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xvi	Atrazine	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xvii	Parathion Methyl	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xviii	Paraoxon methyl	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xix	Malathion	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xx	Malaoxon	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xxi	Ethion	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)
xxii	Chlorpyrifos	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)	BDL (DL - 0.03)

GROUND WATER QUALITY (APRIL 2024 TO SEPTEMBER 2024)
KHONDBOND IRON & MANGANESE MINE
AUGUST 2024

	Parameter	Ganua Village (Mr. Keshar Patra)	Guruda Village (Nr. Club)	Guruda Village	Khondbond Village (Mr. Mothua Munda)	OMC Colony
I	**Discipline : Biological Water**					
1	*Escherichia coli*	Absent	Absent	Absent	Absent	Absent
II	**Discipline : Chemical**					
2	Total Alkalinity (as Calcium Carbonate)	171.68	196.28	147.39	176.31	191.47
3	Anionic Detergents (as MBAS)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)
4	Colour	3	2	3	3	2
5	Cyanide (as CN)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)	BLQ (LOQ-0.005)
6	Chloride (as Cl)	27.61	31.76	31.46	34.76	27.46
7	Calcium (as Ca)	52.46	49.21	47.58	43.81	51.37
8	Free Residual Chlorine	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)	BLQ (LOQ-0.1)
9	Fluoride (as F)	0.17	0.27	0.21	0.17	0.21
10	Magnesium (as Mg)	11.53	11.94	12.68	13.68	13.17
11	Nitrate (as NO_3)	5.17	5.67	3.82	4.57	6.28
12	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
13	pH	6.81 at 25°C	7.21 at 25°C	6.91 at 25°C	8.14 at 25°C	7.91 at 25°C
14	Phenolic compounds (as C_6H_5OH)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)
15	Sulphate (as SO_4)	8.53	8.76	6.38	12.67	12.57
16	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
17	Total dissolved solids	451	453	437	451	482
18	Turbidity	0.3	0.3	0.3	0.3	0.6
19	Total hardness (as $CaCO_3$)	178.50	172.06	171.02	165.71	182.51
II	**Chemical Testing 2. Residues In Water**					
20	Arsenic (as As)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
21	Aluminium (as Al)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
22	Barium (as Ba)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
23	Boron (as B)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
24	Copper (as Cu)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
25	Cadmium (as Cd)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)	BLQ (LOQ-0.002)
26	Iron (as Fe)	0.16	0.13	0.09	0.16	0.23

GROUND WATER QUALITY (APRIL 2024 TO SEPTEMBER 2024)
KHONDBOND IRON & MANGANESE MINE
AUGUST 2024

	Parameter	Ganua Village (Mr. Keshar Patra)	Guruda Village (Nr. Club)	Guruda Village	Khondbond Village (Mr. Mothua Munda)	OMC Colony
27	Lead (as Pb)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
28	Manganese (as Mn)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
29	Mercury (as Hg)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)
30	Selenium (as Se)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
31	Total Chromium (as Cr)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
32	Zinc (as Zn)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)	BLQ (LOQ-0.02)
33	Polynuclear aromatic hydrocarbon (PAH)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
IV	**Discipline : Chemical**					
34	Mineral Oil	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)	BLQ (LOQ-0.001)
V	**Discipline : Chemical**					
35	**Pesticide Residues Organochlorine**					
i	Alpha-HCH	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)	BLQ (LOQ-0.01)
ii	Beta HCH	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
iii	Gamma - HCH (Lindane)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
iv	Delta- HCH	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
v	Alachlor	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
vi	Aldrin	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
vii	Dieldrin	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
viii	Butachlor	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
ix	p,p´-DDE	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
x	o,p´-DDE	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xi	p,p´-DDD	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xii	o,p´-DDD	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xiii	o,p´- DDT	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xiv	p,p´- DDT	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xv	Monocrotophos	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xvi	Atrazine	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xvii	Parathion methyl	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xviii	Paraoxon methyl	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xix	Malathion	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xx	Malaoxon	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xxi	Ethion	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)
xxii	Chlorpyrifos	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)	BLQ (LOQ-0.03)

SURFACE WATER QUALITY REPORT April 2024 TO September 2024)

KHONDBOND IRON & MANGANESE MINE

Parameters		SW-1 - Sona River Upstream					
I	**Biological Testing 1.Water**	**Apr 24**	**May 24**	**Jun 24**	**Jul 24**	**Aug 24**	**Sep 24**
1	Total Colifom	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)
II	**Chemical Testing 1.Water**						
2	pH value	8.21	8.31	8.24	8.42	8.29	8.17
3	Colour	1	6	12	18	21	32
4	Dissolved Oxygen	6.5	6.7	6.3	6.5	6.1	6.7
5	Total Suspended Solid (as TSS)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	2.39	2.53	2.57	2.43	2.61	2.87
7	Chemical oxygen demand	8.52	9.26	11.64	10.92	11.24	12.58
8	Total Dissolved Solids (TDS)	528	638	1152	1257	1328	1426
9	Copper (as Cu)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)
10	Chloride (as Cl)	36.51	42.85	38.46	42.58	46.27	53.94
11	Sulphate (as SO_4)	23.46	27.29	21.58	27.19	26.92	24.52
12	Nitrate (as NO_3)	11.32	12.64	13.64	12.94	11.34	13.16
13	Fluoride (as F)	0.41	0.48	0.52	0.47	0.52	0.63
14	Cyanide (as CN)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C_6H_5OH)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)
	Chemical Testing 2. Residues In Water						
17	Iron (as Fe)	0.37	0.38	0.41	0.46	0.42	0.46
18	Cadmium (as Cd)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
19	Selenium (as Se)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
20	Arsenic (as As)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)
21	Lead (as Pb)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
22	Zinc (as Zn)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
23	Hexa Chromium (as Cr^{+6})	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
24	Mercury (as Hg)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)
25	Manganese (as Mn)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)

SURFACE WATER QUALITY REPORT

KHONDBOND IRON & MANGANESE MINE

	Parameters	SW-2 - 2. Sona River Downstream					
I	**Biological Testing 1.Water**	**Apr 24**	**May 24**	**Jun 24**	**Jul 24**	**Aug 24**	**Sep 24**
1	Total Colifom	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)	BDL(DL-2)
II	**Chemical Testing 1.Water**						
2	pH value	7.97	8.16	8.13	8.17	8.14	7.93
3	Colour	1	4	8	12	18	28
4	Dissolved Oxygen	6.3	6.2	6.1	6.2	5.8	6.3
5	Total Suspended Solid (as TSS)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	2.17	2.47	2.42	2.19	2.57	2.76
7	Chemical oxygen demand	7.64	8.51	9.27	7.38	9.46	11.94
8	Total Dissolved Solids (TDS)	492	594	836	927	1052	1257
9	Copper (as Cu)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)	BDL(DL-0.03)
10	Chloride (as Cl)	32.64	38.46	32.94	36.91	38.43	41.68
11	Sulphate (as SO_4)	21.52	24.81	18.53	23.37	21.57	18.94
12	Nitrate (as NO_3)	9.27	9.52	9.72	11.68	9.47	11.59
13	Fluoride (as F)	0.38	0.37	0.43	0.36	0.43	0.57
14	Cyanide (as CN)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C_6H_5OH)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)
	Chemical Testing 2. Residues In Water						
17	Iron (as Fe)	0.34	0.32	0.38	0.37	0.36	0.38
18	Cadmium (as Cd)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
19	Selenium (as Se)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
20	Arsenic (as As)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)	BDL(DL-0.05)
21	Lead (as Pb)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
22	Zinc (as Zn)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
23	Hexa Chromium (as Cr^{+6})	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)
24	Mercury (as Hg)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)	BDL(DL-0.01)
25	Manganese (as Mn)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)	BDL(DL-0.1)