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No. JSW/S/O/2022/841

Date: 30/11/2022

To,

The Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (Eastern Zone), A/3, Chandrasekharpur, Bhubaneswar – 751023	The Member Secretary, State Level Environment Impact Assessment Authority, SRF-2/1, Acharya Vihar, Unit – IX, OPTCL Colony, Anand Bazar, Bhoi Nagar, Bhubaneswar, Odisha 751022
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Sub: - Submission of Six-monthly EC compliance report for the **Gonua Iron Ore Mine of M/s JSW Steel Ltd for the period April 2022 to September 2022**.

Ref: - 1. Vesting Order dated 30th May 2020 issued by GoO, Steel and Mines Department.
2. Environment Clearance Letter dated 21.12.2019 issued by SEIAA, Odisha.

Dear Sir,

We are submitting herewith six-monthly EC compliance report of Gonua Iron Ore Mine, M/s JSW Steel Ltd. for the period April 2022 to September 2022 as per EIA notification 2006. The same is also attached in Soft copy to your good office on e-mail to seiaaorissa@gmail.com; and roez.bsr-mef@nic.in; for your ready reference.

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

Seeking your co-operation as always.

Thanking you,

Yours Faithfully
For JSW Steel Ltd

Mrutyunjaya Mahapatra
(Authorized Signatory)

Encl: As above



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Copy to:

1. The Member Secretary, Central Ground Water Authority, Government of India, Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Bhujal Bhawan, CGO Complex, NH-IV, Faridabad- 121 001.
2. Zonal Office Kolkata, Central Pollution Control Board, South end Conclave, Block 502, 5th and 6th Floors, 1582 Razidanga Main Road, Kolkata, West Bengal 700107.
3. The Regional Director, Central Ground Water Board, South Eastern Region, Bhujal Bhawan, Khandagiri Square, NH-5, Bhubaneswar, Odisha, Pin- 751001
4. The Member Secretary, State Pollution Control Board, A/118, Nilakantha Nagar, Bhubaneswar, Odisha-751012.
5. The Regional Officer, Regional Office, Rourkela Office of the State Pollution Control Board Rourkela Town Engineering Office Premises, Sector – 5, Rourkela – 769 002, Odisha



ENVIRONMENT CLEARANCE COMPLIANCE STATUS –GONUA MINE

Six Monthly Compliance report of Environmental Clearance for Gonua Iron Ore Mine, JSW Steel Ltd. for the period from- April 2022 to Sep 2022.



Reference letter from SEIAA, Odisha- SEIAA File No. 38069/03-MIN-V/09/2019/7685/ SEIAA, Dated 21.12.2019.

Capacity- 1.20 MTPA of Iron ore.

A. Specific Conditions


Sl.No.	Specific Conditions	Compliance
1	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court of Odisha, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.	Noted and abided with the conditions given by court of Law.
2	This Environmental Clearance will not be operational till such time the Project proponent complies with all the statutory requirements and Judgment 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 Others applicable to this project	Not Applicable
3	The Department of Mines and Geology, Government of Odisha shall ensure that mining operation shall not commence till the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department of Mining & Geology in strict compliance of judgment 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 Others.	Not Applicable
4	The proponent shall comply all the specific conditions as recommended by CSIR-NEERI on carrying capacity study (as applicable) in time bound manner as proposed.	Will be complied within timeline.
5	The project proponent shall mandatorily implement the remediation plan as well as Natural and Community Resource Augmentation Plan as submitted in the Final EIA/EMP Report in Chapter -10. The status of implementation shall be submitted to the Regional Office, MoEF & CC,SPCB and SEIAA, Odisha along with six monthly compliance reports.	Will be complied within timeline. EIA/EMP report is under progress for project expansion.

6	The Project Proponent shall obtain Consent to Operate from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein.	Being Complied. CTO has been vested to JSW Steel Ltd for 2 years. New CTE vide letter no 6019/IND-II-CTE-6462 dated 13.04.2021 and CTO vide letter no 4907/IND-I-CON-1539 dated 29.03.2022 have been obtained from OSPCB.
7	The Project Proponent shall carryout sustainable and scientific mining in conformity with the approved mining plan and accordingly, strict monitoring shall be carried out by the Regional Office, MoEF & CC, Govt. of India, Bhubaneswar, Odisha State Pollution Control Board and Department of Mines and Steel, Government of Odisha.	Being complied. Sustainable and scientific mining in conformity with the approved mining plan being carried out.
8	The Project Proponent shall carryout monitoring of air quality parameters covered under NAAQS notification, 2009 and Fugitive dust emission monitoring as per the action plan submitted to the Ministry. The frequency of monitoring shall be governed by MoEF & CC, Govt. of India circular dated 27.05.2009 and Consent to Operate issued by Odisha State Pollution Control Board for ambient air and fugitive dust emission respectively.	Regular Ambient air quality monitoring and fugitive dust emission monitoring being carried out and data is well within the limit prescribed. AAQ Monitoring reports are attached as Annexure 1a .
9	No mining activities will be allowed in forest area for which the Forest Clearance is not available.	The present mining operation is restricted within vested Forest area only as per FC F. No. 8-47/93-FC, Dtd. 07/09.08.1996 over 54.40 ha. Fresh forest clearance under FC Act, 1980 for diversion of 82.724 ha of forest land has also been applied vide Proposal No. FP/OR/MIN/51003/2020 dated 15.10.2020 and same is under evaluation. Advance NPV has already been paid. Further, as per MMDR Amendment Act 2021, the Forest clearances and other permissions continue to be valid even after expiry or permission of lease till the minerals exhausted. Hence, the Forest Clearance for 54.40 ha will be valid till life of the mine
10	The Environmental Clearance is subject to obtaining requisite NBWL Clearance, if any, from the Standing Committee of National Board for Wildlife for Mining project.	No Wild Life Sanctuary/Tiger Reserve/National Park/ Elephant corridor within the core as well as within the buffer zone of the project. New EC (TOR) has been issued and EIA report is under progress and will obtain if

		required. SSWLCP approval letter has been attached as Annexure 2
11	Project Proponent should plant only native species for green belt development. Plantation of local species should be carried out during the Monsoon Season.	<p>Being complied and in the Financial Year 2021-22 and 22-23, Total 6500 native saplings were planted.</p>  <p>PLANTATION DURING MONSOON</p>
12	The Proponent shall install online Ambient Air Quality Monitoring System and there should be system for display of digital AAQ data within 03 months at least at three locations as per wind direction. Online provisions of pH and turbidity meters at discharge points of STP and ETP and also at water storage ponds in the mining area may be made. Project Proponent should display the result digitally in front of the main Gate of the mine site.	<p>Regular Ambient air quality monitoring and fugitive dust emission monitoring being carried out and data is well within the limit prescribed. AAQ Monitoring reports are attached as Annexure 1a. Electronic Digital Display Board has already been installed near Gate No 2 area for displaying of ambient air quality monitoring data, noise monitoring data, water/wastewater quality monitoring data etc.</p>  <p>ELECTRONIC DISPLAY AT GONUA</p>

13	<p>Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) in case of intersecting the Ground water table. The intersecting ground water table can only be commencing after conducting detailed hydrogeological study and necessary permission from the CGWA/MoEF&CC. The Report on six monthly basis on changes in Ground water level and quality shall be submitted to the Regional Office of the Ministry, CGWA and State Pollution Control Board.</p>	<p>NOC from CGWA for 75 m³/day is already vested to JSW for 2 years. New application for the NOC has been granted vide Letter No. CGWA/NOC/MIN/ORIG/2022/15411 And valid upto 09/05/2024. Regular monitoring of ground water level and quality being carried out and monitoring reports are attached as Annexure 1b.</p>
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14	<p>The project should also implement community Development and Welfare programme in the area of Health, Education and Environmental Protection.</p>	<p>Being complied. Gonua Mining operation was started from 1st July 2020 and various community development initiatives are under implementation for community up-liftment.</p> <p>Need based assessment survey has been completed and action plan is under implementation for the compliance. Peripheral Activities like SHG trainings, Health camps are being conducted.</p> <div data-bbox="963 595 1458 927" data-label="Image"> </div> <p>FOCUSED GROUP DISCUSSION</p> <div data-bbox="957 999 1431 1335" data-label="Image"> </div> <p>HAND WASH TRAINING</p>
15	<p>Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be</p>	<p>Workers engaged in Operations are provided with PPE's. Besides this, acoustic enclosures are provided for all machines operating within the mines. The noise level is being monitored by Noise Level Meter; the results reveal that</p>

	undertaken once in six months and necessary remedial/preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented; The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.	the parameter is well within the prescribed norms. Initial Medical Examination & Periodical Medical Examination of the workers engaged in the project are being carried periodically and records are maintained. A medical dispensary with full time Doctor has been appointed at mine area for the health check-up of employees and also the locals.
16	Project Proponent shall run an awareness campaign on sanitation for women and utilization of Sanitary Napkin and also to distribute the Sanitary Napkin/pads to the women and provide the training for proper disposal	Being complied  HYGINE TRAINING
17	The Regular monitoring of ground water table to be carried out by establishing a network of existing wells and constructing new piezometers. The reports shall be submitted at interval of six months to the Regional Office of the MoEF & CC, Govt. of India, Bhubaneswar and Odisha State Pollution Control Board.	Regular monitoring of ground water level and quality being carried out and monitoring reports are attached as Annexure 1b .
18	The water balance/ water auditing shall be carried out and measures for reducing the consumption of water shall be taken up and reported to the Regional Office of the MoEF & CC, Govt. of India, Bhubaneswar and Odisha State Pollution Control Board	Being complied.
19	The Regular monitoring of water quality upstream and downstream of water bodies shall be carried out and record of monitoring data should be maintained and submitted to the at interval of six months to the Regional Office of the MoEF & CC, Govt. of India, Bhubaneswar and Odisha State Pollution Control Board	Regular monitoring of water quality of upstream and downstream being carried out and monitoring reports are attached as Annexure 1b . Vendor is a recognised NABET, MoEF&CC accredited laboratory.
20	The Plantation/Green belt at the periphery of the water body, particularly on eastern and western boundaries, shall be maintained in	Being complied. More than 6500 Saplings (Yearly Plantation of FY 2021-22 and 23-22) has been planted as per


	the mined out area in order to reduce the loss of surface water.	approved mine plan in the safety zone, and other areas before monsoon season.
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B. General Conditions

Sl. No.	General Conditions	Compliance
1	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest and Climate Change (MoEF & CC), Govt. of India as well as SEIAA, Odisha 3 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 & Forests and SEIAA.
2	No change in mining technology and scope of working should be made without prior approval of the SEIAA, Odisha.	Noted and Being complied
3	No change in the calendar plan including excavation, quantum of mineral and waste should be made.	Noted and Being complied
4	The project proponent shall obtain necessary prior permission of the competent authority for drawl of requisite quantity of water (surface water and ground water) for the project.	NOC from CGWA for 75 m3/day is already vested to JSW for 2 years. New application for the NOC has been granted vide Letter No. CGWA/NOC/MIN/ORIG/2022/15411 And valid upto 09/05/2024.
5	Mining shall be carried out as per the provisions outlined in mining plan approved by Indian Bureau of Mines (IBM) as well as by abiding to the guidelines of Directorate General Mines Safety (DGMS)	Noted and Being complied
6	The project proponent shall carry out scientific investigation in respect of Blast induced ground vibration, fly rock & air blast. Based on this study, Project Proponent should design an effective blast design to curb blast induced menace and public annoyance. The Report shall be submitted to the SEIAA, Odisha as well as the Regional Office of the Ministry.	Being Complied. Controlled blasting is in place.
7	The lands which are not owned by Proponent, mining will be carried out only after obtaining the consents from all the concerned (and owners as per the	Noted and Being complied.

	provisions of the Mineral Concession Rules, 1960 and MMDR Act, 1957.	
8	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 the SEIAA, Odisha as well as to the Ministry of Environment, Forest and Climate Change and its Regional Office.	DGPS Surveyed Mining lease boundary superimposed on High Resolution Satellite image of Gonua Iron Ore Mine duly vetted by M/s ORSAC has been attached as Annexure 3
9	The critical parameters of ambient air quality as per the Notification 2009 such as PM ₁₀ , PM _{2.5} , NO ₂ and SO ₂ etc. 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. J-20012/1/2006-IA.II (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance	Regular Ambient air quality monitoring and Water quality monitoring being carried out and monitoring reports are attached as Annexure 1a & 1b . Vendor is a recognised NABET, MoEF&CC accredited laboratory.
10	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of PM ₁₀ and PM _{2.5} such as haul road, loading and unloading point and transfer points. Fugitive dust emissions from all the sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard Monitoring of Ambient Air Quality to be carried out based on the Notification 2009, as amended from time to time by the Central Pollution Control Board	Regular water sprinkling through mobile water sprinkler tankers being carried out on haul roads and nearby mineral dispatch roads to avoid generation of dust during movement of vehicles. Fixed auto sprinklers on both sides of major haul road and approach roads of the mine is in commissioning phase. However, as an interim arrangement frequency of the Mobile water tankers sprinkling has been increased to suppress the dust emission generated due to transportation of vehicles. Regular maintenance of Haul roads is being carried out to avoid generation of dust during movement of vehicles. Regular monitoring of ambient air quality parameters being carried out through and data is well within the limit prescribed. AAQ Monitoring reports are attached as Annexure 1a .

11	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations. The monitoring shall be carried out four times in a year pre- monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to the SEIAA, Odisha as well as Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board.	Regular monitoring of ground water level and quality being carried out and Monitoring Reports of pre monsoon (March-April 2022) and Winter season (November December 2021) are attached as Annexure 1b . Vendor is a recognized NABET, MoEF & CC accredited laboratory.
12	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 maintain. The natural water bodies and or streams which are flowing in an around the village, should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Proponent has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug wall located in village should be incorporated to ascertain the impact of mining over ground water table.	Regular monitoring of flow rate of the springs and perennial nallahs being carried out and monitoring reports are attached as Annexure 1b .
13	Regular monitoring of water quality upstream and downstream of water bodies shall be carried out and record of monitoring data should be maintained and submitted to the SEIAA, Odisha as well as Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.	Regular monitoring of water quality of upstream and downstream being carried out and monitoring reports are attached as Annexure 1b . Vendor is a recognised NABET, MoEF&CC accredited laboratory.


		 <p>Latitude: 21°55'35" Longitude: 83°22'26" Accuracy: 4.23m ± Time: 17-09-2022 11:50 Note: xDHCopraholic Upstream</p> <p>KAKARPANI NALA SAMPLE COLLECTION</p>
14	<p>Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The project proponent shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads</p>	<p>Transportation of the minerals being carried out through the bypass road which is away from the habitation. Regular maintenance including widening of the road is being carried out for maintaining/increasing the carrying capacity of the road. .</p>
15	<p>The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours.</p>	<p>Being complied.</p>
16	<p>Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. The material transfer points should invariably be provided with Bag filters and or dry logging system. In case of Belt-conveyors facilities the system should be fully covered to avoid</p>	<p>Regular water sprinkling through mobile water sprinkler tankers being carried out on haul roads and nearby mineral dispatch roads to avoid generation of dust during movement of vehicles.</p> <p>Fixed auto sprinklers on both sides of major haul road and approach roads of the mine are operational. However, as an interim arrangement frequency of the Mobile water</p>

	air borne dust; Use of effective sprinkler system to suppress fugitive dust on haul roads and other transport roads shall be ensured	tankers sprinkling has been increased to suppress the dust emission generated due to transportation of vehicles. Regular maintenance of Haul roads is being carried out to avoid generation of dust during movement of vehicles.
17	Sufficient number of Gullies to be provided for better management of water. Regular Monitoring of pH shall be included in the monitoring plan and report shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.	Regular monitoring of water quality being carried out and monitoring reports are attached as Annexure 1b . Existing series of settling ponds being maintained for surface water management.  <p>Viva XSO Pro Feb 22, 2021 12:30</p>
		SETTLING POND SERIES
18	There shall be planning, developing and implementing facility of rainwater harvesting measures on long term basis and implementation of conservation measures to augment ground water resources in the area in consultation with Central Ground Water Board	Maximum rain water has already been channelized to Mine Pits and same is being utilized in dust suppression and other mining activities. Existing surface run-off Retention wall, Garland drains and setting pits being maintained. Detailed Hydrology study is prepared, recommendations of the study and consultation with CGWB, additional rain water harvesting measures/structures will be implemented for rainwater harvesting.
19	The Project Proponent has to take care of gullies formed on slopes. Dump mass should be consolidated with proper filling/levelling with the help of dozer/compactors.	Being complied.
20	The reclamation at waste dump sites shall be ecologically sustainable. Scientific reclamation shall be followed. The local species may be encouraged and species are so chosen that the slope, bottom of the dumps and top of the dumps are able to sustain these species. The aspect of the dump is also a factor which regulates	Being complied. Over burden being stacked at earmarked site and after maturity same will be stabilized with plantation.

	some climatic parameters and allows only species adopted to that micro climate	
21	<p>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. 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. The maximum height of the dumps shall not exceed 8m and width 20 m and overall slope of the dumps shall be maintained to 45°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. The entire excavated area shall be backfilled and afforested. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.</p>	Being Complied. Top soil generation, if any, being stored at earmarked site and will be used for land reclamation, plantation purpose or stabilized with plantation.
22	<p>Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, mineral and OB dumps to prevent run off of water and flow of sediments directly into the river and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. The drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dumps to prevent run off of water and flow of sediments directly into the river and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50</p>	Existing Retention wall, Garland drains and setting pits being maintained to prevent any direct flow of runoff to nearby water bodies. Desilting of the settling pond being done on regular basis.

	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 interval.	
23	Plantation shall be raised in a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around water body, along the roads etc. by planting the native species in consultation with the local DFO/Agriculture Department and as per CPCB Guidelines. The density of the trees should be around 2500 plants per ha. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years	Being complied. More than 6500 Saplings (Yearly Plantation of FY 2021-22 and 22-23) has been planted as per approved mine plan in the safety zone, and other areas before monsoon season.
24	Project Proponent shall follow the mitigation measures provided in Office Memorandum No. Z-11013/57/2014-IA.II (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area", if any, applicable to the project.	Noted and being complied.
25	The Project Proponent shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing, if any. In this context, Project Proponent should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded against felling and plantation of such trees should be promoted	No such grazing land available inside mine lease area.
26	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna, if any, spotted in the	No Wild Life Sanctuary/Tiger Reserve/National Park/ Elephant corridor within the core as well as within the buffer zone of the project. New EC has been applied and

	study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.	EIA report is under progress and action plan for conservation of flora and fauna will be prepared if required. The Site Specific Wildlife conservation Plan has been duly approved by PCCF, , vide Letter No. 990/CWLW-FDWC-FD-0125-2021, Bhubaneswar dated 31/01/2022
27	Project proponent has to complied the Corporate Environment Responsibility (CER) as per the provisions mentioned in the OM of Ministry no 22-65/2017. IA-III dated 1 May, 2018 based on local needs and action plan with financial and physical breakup/details shall be prepared and submitted to the Ministry's Regional Office located at Bhubaneswar. Implementation of such program shall be ensured accordingly in a time bound manner.	New EC has been applied and EIA report is under progress. Accordingly, same will be implemented.
28	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.	No colony located within lease area.
29	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 / mulls	Noise producing equipment's are covered as far as practicable. Workers engaged in Operations are provided with ear plugs / muffs. Besides this, acoustic enclosures are provided for all machines operating within the mines. Controlled blasting is in place. Regular Noise Monitoring being carried out and Monitoring reports are attached as Annexure 1c .
30	Industrial waste water (workshop and waste water 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	No industrial waste water generated from the mine. Workshop equipped with waste water treatment facilities followed by Oil & Grease trap system and then recycled for captive utilisation for HEMM washing.
31	Personnel working in dusty areas should wear protective respiratory device sand they should also be provided with adequate training and information on safety and health aspects	Personnel working in dusty areas are provided with nose mask, safety glass and ear plug with proper safety training. Dust Suppression System (Dry fog system) being provided at all appropriate places of

		<p>mineral handling plants (crusher & screening plant) and other areas. Same are being maintained for proper dust control.</p>  <p>DRY FOG</p> <p>Pre-placement medical examination and periodical examination of the workers engaged are being conducted & record maintained.</p>
32	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 dedicated Environment Management Cell under the leadership of AVP Environment has been formed and reporting to Mine Senior Management i.e. Head of Operations (VP).
33	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.	<p>We are in process for implementation of various measures undertaken for environment management plan since the operation started in July 2020.</p> <p>Details of environmental protection measures expenditure (head wise breakup) was submitted along with last half yearly EC compliance report vide letter dated 21.05.2021.</p>
34	The project authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	Noted and will be complied.
35	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment, Forest and Climate Change, its Regional Office, Central Pollution Control Board and State Pollution Control Board	Being complied. Last six monthly compliance report along with monitoring data vide letter no JSW/S/O/2022/358 dated 30/05/2022 was submitted to Regional Office, MOEF&CC, Bhubaneswar, SEIAA, Bhubaneswar, Zonal Office, CPCB, Kolkata, MS and RO Offices SPCB, Odisha.
36	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project	We will extend full co-operation to the officers of the Regional Office during their visit and

	authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.	furnish the required data, information and monitoring reports.
37	A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal	Not Applicable
38	State Pollution Control Board should display a copy of the clearance letter at the Regional office. District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.	Not Applicable
39	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest and Climate Change at www.environmentclearance.nic.in and a copy of the same should be forwarded to the Regional Office.	Not Applicable
40	The SEIAA, Odisha or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection	Noted for compliance
41	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted for compliance
42	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other	Noted for compliance

	orders passed by the Hon'ble Supreme Court of India/ High Court of Odisha and any other Court of Law relating to the subject matter.	
43	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	There is no such appeal against EC given.

SUMMARY
OF
ENVIRONMENTAL MONITORING REPORT
(APRIL 2022 TO SEPTEMBER 2022)
FOR
GONUA IRON ORE MINE
DISTRICT—KEONJHAR, ODISHA
OF



M/S JSW STEEL LIMITED, ODISHA

ENV MONITORING CARRIED OUT

BY



ECOMEN LABORATORIES PVT.LTD

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Environmental Monitoring Report- Gonua Iron Ore Mines of M/s JSW Steel Limited, Odisha during the period (April 2022 to September 2022)

1. Ambient Air Quality Lease Area

Si. No.	Location	Month	Concentration	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
1.	Near Mines Office	April'22	Maximum	70.3	24.2	13.4	24.6	0.8
			Minimum	42.0	14.8	6.8	15.6	0.29
			Average	54.0	19.3	9.8	20.0	0.52
		May'22	Maximum	66.4	22.5	13.4	21.8	0.6
			Minimum	49.3	15.3	8.3	14.2	0.39
			Average	55.0	19.0	11.2	18.4	0.51
		June'22	Maximum	68.7	22.3	13.6	22.1	0.61
			Minimum	47.9	16.5	8.6	15.1	0.33
			Average	53.0	19.3	10.6	18.1	0.50
		July'22	Maximum	54.3	19.8	12.5	20.1	0.53
			Minimum	41.5	14.6	9.4	14.3	0.32
			Average	48.2	17.1	10.7	17.0	0.45
		August'22	Maximum	49.2	19.3	13.5	19.1	0.49
			Minimum	41.1	12.3	8.7	13.3	0.33
			Average	44.0	15.7	10.9	15.9	0.40
		September'22	Maximum	59.7	19.6	16.2	19.3	0.61
			Minimum	49.3	10.5	11.5	11.3	0.39
			Average	53.7	15.1	13.7	15.1	0.50
		April'22	Maximum	66.4	26.4	15.6	25.2	0.64
			Minimum	48.2	13.4	6.8	2.4	0.28
			Average	56.9	19.7	10.6	19.0	0.49

Si. No.	Location	Month	Concentration	PIlio $\mu\text{g}/\text{m}^3$	PM2.5 lug/m^3	SO2 lug/m^3	NO2 lug/m^3	CO mg/m^3
2.	Near Pillar No 22 & 23	May'22	Maximum	64.5	21.2	16.2	21.4	0.58
			Minimum	53.2	15.4	8.9	10.7	0.40
			Average	58.3	18.1	11.2	17.7	0.49
		June'22	Maximum	62.7	20.6	15.7	22.5	0.56
			Minimum	52.1	15.1	9.2	11.8	0.42
			Average	58.1	17.9	11.2	17.5	0.49
		July'22	Maximum	56.5	19.7	14.7	19.6	0.56
			Minimum	46.4	13.9	9.2	10.8	0.42
			Average	51.3	16.8	11.0	16.6	0.48
		August'22	Maximum	47.3	17.8	12.9	18.1	0.48
			Minimum	40.3	13.7	9.4	8.8	0.40
			Average	43.2	15.4	11.3	15.5	0.44
		September'22	Maximum	57.8	17.9	16.7	19.3	0.59
			Minimum	50.2	11.4	12.2	12.2	0.42
			Average	52.8	14.3	14.5	15.0	0.50
3.	Near Dispensary (Hutting Area)	April'22	Maximum	61.0	20.1	14.8	23.4	0.6
			Minimum	43.4	13.9	8.8	12.8	0.27
			Average	53.9	17.8	10.9	18.1	0.41
		May'22	Maximum	60.5	20.1	14.2	21.2	0.51
			Minimum	45.9	14.2	9.2	11.2	0.32
			Average	53.9	17.1	11.4	16.9	0.43
		June'22	Maximum	61.6	20.3	15.1	21.2	0.52
			Minimum	46.7	13.8	10.1	12.3	0.30
			Average	53.8	17.5	11.8	17.0	0.43
		July'22	Maximum	54.7	19.3	14.1	19.2	0.53
			Minimum	45.3	12.8	9.1	11.3	0.35
			Average	51.3	16.7	11.0	15.9	0.42

Sl. No.	Location	Month	Concentration	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³		
		August'22	Maximum	48.6	18.6	13.8	17.7	0.48		
			Minimum	41.2	13.3	9.4	11.2	0.39		
			Average	44.8	16.0	11.4	14.8	0.43		
		September'22	Maximum	55.6	16.5	16.7	19.8	0.58		
			Minimum	50.4	12.1	12.3	11.5	0.40		
			Average	53.2	14.0	14.0	14.9	0.51		
4.	Entry And Exit Gate (Gate No-2)	April'22	Maximum	76.4	38.4	18.3	29.6	0.68		
			Minimum	53.4	17.5	8.9	14.6	0.29		
			Average	67.1	28.9	12.6	22.9	0.46		
		May'22	Maximum	74.3	29.4	17.1	24.5	0.6		
			Minimum	60.5	18.5	9.8	15.6	0.32		
			Average	68.0	23.9	12.6	21.4	0.45		
		June'22	Maximum	74.7	29.8	16.3	21.6	0.62		
			Minimum	62.4	20.7	10.7	10.4	0.38		
			Average	68.6	25.3	12.9	16.2	0.50		
		July'22	Maximum	52.5	20.3	15.3	19.8	0.55		
			Minimum	46.4	15.2	10.4	9.4	0.39		
			Average	50.2	17.9	12.6	14.9	0.48		
		August'22	Maximum	48.6	17.7	14.3	18.2	0.49		
			Minimum	40.2	13.4	10.2	11.6	0.40		
			Average	44.4	15.4	12.3	14.8	0.45		
		September'22	Maximum	55.2	19.6	16.2	16.6	0.59		
			Minimum	50.6	13.1	12.0	12.6	0.43		
			Average	52.9	16.3	13.8	14.1	0.51		
		CPCB Standard			24 Hrly	100	60	80	80	4 (1Hrly)
					Annual Average	60	40	40	50	--

2. Ambient Air Quality Buffer Area

Si. No.	Location	Month	Concentration	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
1.	Palssa Village	April'22	Maximum	77.2	43.6	17.6	27.0	0.61
			Minimum	61.9	24.5	10.8	19.8	0.38
			Average	68.8	30.3	13.4	23.0	0.51
		May'22	Maximum	74.2	27.4	13.5	20.3	0.52
			Minimum	65.8	22.4	10.8	17.4	0.4
			Average	69.6	25.1	12.2	19.2	0.46
		June'22	Maximum	62.8	26.3	13.2	19.7	0.5
			Minimum	53.2	19.3	10.4	14.5	0.41
			Average	58.9	22.8	11.6	17.4	0.46
		July'22	Maximum	63.7	25.3	12.5	18.7	0.49
			Minimum	55.2	20.3	10.2	15.5	0.4
			Average	59.1	23.0	11.5	17.6	0.44
		August'22	Maximum	50.9	21.4	12.7	18.3	0.48
			Minimum	46.5	18.2	10.3	14.5	0.41
			Average	48.6	19.9	11.4	16.4	0.45
		September'22	Maximum	58.2	23.5	16.3	15.2	0.59
			Minimum	52.6	19.4	12.1	12.3	0.49
			Average	56.1	21.0	13.9	13.7	0.54
		April'22	Maximum	72.0	31.8	17.6	28.6	0.62
			Minimum	48.9	21.9	11.9	18.6	0.36
			Average	59.6	27.8	14.2	24.9	0.48

Si. No.	Location	Month	Concentration	PIlio µg/m ³	PM2.5 lug/m ³	SO2 lug/m ³	NO2 lug/m ³	CO mg/m ³
2.	Khandbandh Village	May'22	Maximum	67.3	22.2	14.2	23.6	0.58
			Minimum	51.3	18.4	11.2	16.1	0.39
			Average	60.1	20.3	12.4	20.2	0.46
		June'22	Maximum	59.6	21.6	13.4	21.8	0.49
			Minimum	48.1	16.1	10.2	14.6	0.39
			Average	55.6	18.7	11.9	18.5	0.44
		July'22	Maximum	60.1	22.8	14.2	22.8	0.49
			Minimum	49.8	16.5	10.9	15.6	0.4
			Average	55.2	19.0	12.7	18.7	0.44
		August'22	Maximum	48.9	18.3	12.9	18.6	0.45
			Minimum	41.2	15.2	10.5	15.4	0.41
			Average	45.6	16.9	11.6	17.1	0.43
		September'22	Maximum	56.1	21.4	16.2	15.6	0.57
			Minimum	51.5	19.5	11.3	12.7	0.48
			Average	53.8	20.3	14.0	14.1	0.51
3.	Sargighar Village	April'22	Maximum	53.8	25.6	18.0	28.4	0.59
			Minimum	46.4	17.6	11.3	22.4	0.38
			Average	50.0	21.6	13.5	25.0	0.44
		May'22	Maximum	57.4	19.4	16.7	24.5	0.5
			Minimum	46.1	15.2	10.4	18.3	0.39
			Average	51.3	17.4	13.2	21.0	0.45
		June'22	Maximum	51.6	18.3	14.7	20.5	0.49
			Minimum	43.9	14.1	10.3	15.3	0.34
			Average	48.5	16.5	11.9	18.4	0.42
		July'22	Maximum	53.3	19.8	13.6	21.2	0.48
			Minimum	42.4	15.5	10.7	16.4	0.39
			Average	48.9	17.5	11.9	18.5	0.44

Sl. No.	Location	Month	Concentration	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³		
		August'22	Maximum	48.1	19.6	15.1	19.7	0.48		
			Minimum	44.6	15.3	11.6	15.2	0.4		
			Average	46.5	17.6	13.5	17.4	0.44		
		September'22	Maximum	58.3	21.7	16.4	15.7	0.57		
			Minimum	51.3	18.5	12.1	13.5	0.49		
			Average	54.6	19.9	14.5	14.6	0.53		
4.	Malda Village	April'22	Maximum	55.9	30.0	13.8	26.0	0.52		
			Minimum	43.6	23.8	10.6	21.4	0.27		
			Average	51.0	27.5	12.2	23.7	0.41		
		May'22	Maximum	57.3	21.5	13.1	21.2	0.48		
			Minimum	45.7	18.4	10.2	17.4	0.39		
			Average	51.2	19.7	11.5	19.6	0.42		
		June'22	Maximum	52.3	21.6	13.4	20.4	0.5		
			Minimum	43.5	16.4	10.1	15.6	0.39		
			Average	48.7	18.9	11.6	18.4	0.44		
		July'22	Maximum	53.9	22.6	13.2	19.4	0.53		
			Minimum	42.2	16.1	10.4	14.3	0.41		
			Average	48.3	19.1	11.9	17.4	0.47		
		August'22	Maximum	46.1	19.5	12.5	18.4	0.48		
			Minimum	43.6	15.3	10.3	14.6	0.42		
			Average	45.0	17.8	11.3	16.7	0.44		
		September'22	Maximum	59.5	23.5	16.2	16.7	0.55		
			Minimum	52.3	19.4	13.1	13.2	0.49		
			Average	56.2	21.1	14.4	14.6	0.52		
		CPCB Standard			24 Hrly	100	60	80	80	4 (1Hrly)
					Annual Average	60	40	40	50	--

3. Fugitive Emission Monitoring ($\mu\text{g}/\text{m}^3$)

Sl. No.	Month	Crusher Plant		Mines Haulage Road		Screen Plant	
		Max	Min	Max	Min	Max	Min
1.	April'22	978.4	668.0	976.4	726.0	962.0	614.3
2.	May'22	910.3	777.9	944.5	805.6	843.2	710.2
3.	June'22	885.2	510.7	878.5	520.8	853.1	510.4
4.	July'22	698.3	624.3	696.2	622.4	694.5	609.8
5.	August'22	599.6	534.2	596.3	532.4	599.6	522.3
6.	September'22	693.5	604.8	699.4	605.3	694.2	602.6
Six Month Average		794.2	620.0	798.6	635.4	774.4	594.9
Sl. No.	Month	Mines face Bench		Ore storage & Loading Point		Waste Dump	
		Max	Min	Max	Min	Max	Min
1.	April'22	970.6	664.0	941.0	696.0	921.7	659.0
2.	May'22	842.3	721.6	942.6	824.8	924.2	798.6



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3.	June'22	846.9	512.1	891.9	513.2	883.8	513.3
4.	July'22	688.7	572.7	689.7	572.7	694.8	545.3
5.	August'22	595.8	521.4	599.7	540.2	588.4	530.1
6.	September'22	697.9	601.9	692.6	605.8	699.7	601.4
Six Month Average		773.7	599.0	792.9	625.5	785.4	608.0

4. ILLUMINATION MONITORING (Lux)

	April 22		May 22		June22	
LOCATION	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Workshop Area	79.0	98.0	74.0	58.0	54.0	75.0
Screen Plant	142.0	114.0	175.0	125.0	33.0	51.0
Haul Road	76.0	50.0	48.0	28.0	15.0	24.0
Loading Point	120.0	63.0	52.0	36.0	32.0	41.0
Crusher Plant	158.0	120.0	175.0	135.0	12.0	18.0
Parking Yard	115.0	78.0	65.0	40.0	86.0	140.0
Permanent Path	58.0	39.0	78.0	39.0	51.0	35.0
Electric Substation	160.0	100.0	180.0	110.0	72.0	58.0
Rest Shelter	76.0	48.0	151.0	107.0	180.0	239.0
Mines Bench Foot Path	50.0	38.0	48.0	32.0	31.0	24.0
	July 22		August 22		September 22	
LOCATION	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Workshop Area	75.0	67.0	55.0	46.0	68.0	82.0
Screen Plant	48.0	156.0	90.0	98.0	17.0	32.0
Haul Road	55.0	46.0	53.0	60.0	29.0	42.0
Loading Point	50.0	35.0	30.0	15.0	19.0	30.0
Crusher Plant	47.0	56.0	57.0	95.0	32.0	70.0
Parking Yard	75.0	135.0	55.0	72.0	43.0	100.0
Permanent Path	43.0	40.0	25.0	58.0	26.0	60.0
Electric Substation	95.0	55.0	41.0	54.0	40.0	80.0
Rest Shelter	21.0	75.0	45.0	52.0	52.0	120.0
Mines Bench Foot Path	70.0	34.0	45.0	52.0	50.0	65.0



5. Noise Level {dB(A)}

A. Ambient Noise Monitoring

Location	April-22		May-22		June-22		Standards	
	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night
EAST BOUNDARY	46.2	34.6	48.3	35.8	42.5	37.6	55 dB(A)	45 dB(A)
WEST BOUNDARY	45.5	36.3	44.9	39.6	45.2	40.3	55 dB(A)	45 dB(A)
NORTH BOUNDARY	47.6	34.5	50.1	36.4	51.2	38.7	55 dB(A)	45 dB(A)
SOUTH BOUNDARY	48.2	33.7	47.8	35.4	48.4	36.7	55 dB(A)	45 dB(A)
Location	July-22		August-22		September-22		Standards	
	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night	Leq Day	Leq Night
EAST BOUNDARY	41.6	36.7	44.7	42.8	48.6	43.7	55 dB(A)	45 dB(A)
WEST BOUNDARY	50.2	41.4	51.3	39.4	53.4	42.6	55 dB(A)	45 dB(A)
NORTH BOUNDARY	52.4	42.3	53.7	44.2	50.3	40.4	55 dB(A)	45 dB(A)
SOUTH BOUNDARY	50.4	39.8	51.2	41.9	53.8	39.2	55 dB(A)	45 dB(A)

B. Source Noise Monitoring

CORE ZONE	April-22				May-22			
-	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4
-	Leq				Leq			
Near Ore Crushing Plant	61.05	69.40	68.46	66.68	64.3	71.2	69.1	68.3
Near Weigh Bridge	66.08	66.80	74.36	64.28	67.1	67.1	73.4	66.1
Near Workshop	59.4	72.00	68.42	67.46	61.5	73.6	69.2	64.2
Near Mines Office	62.8	67.20	66.20	71.60	63.2	69.1	65.2	72.6



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CORE ZONE	June-22				July-22			
-	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4
-	Leg				Leg			
Near Ore Crushing Plant	65.2	69.3	68.2	69.4	66.2	70.3	69.2	68.4
Near Weigh Bridge	68.6	68.2	73.3	67.2	69.6	69.2	70.3	66.2
Near Workshop	62.4	72.4	70.1	63.3	63.4	70.4	69.1	64.3
Near Mines Office	64.7	67.2	66.4	68.5	65.7	68.2	67.4	69.5
CORE ZONE	August-22				September-22			
-	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4
-	Leg				Leg			
Near Ore Crushing Plant	65.3	69.2	68.4	67.5	68.7	56.2	58.5	65.4
Near Weigh Bridge	68.5	68.3	69.5	65.3	66.4	60.5	62.3	67.9
Near Workshop	62.3	69.5	68.2	63.2	63.3	57.4	59.7	67.1
Near Mines Office	66.4	67.6	66.3	67.4	67.5	61.1	63.5	65.5

6. Surface Water Quality

GONUA IRON ORE MINE								
Gonua nala UpStream								
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for Stream Water Standards
PH	-	6.42	6.76	6.42	6.86	6.92	6.94	6.5-8.5
Total Dissolved Solids	mg/l	144.0	156.0	144.0	160.0	180.0	188.0	1500
Chlorides	mg/l	14.0	18.0	14.0	16.0	14.0	16.0	600
Iron	mg/l	0.10	0.12	0.10	0.12	0.08	0.12	50
Fluorides	mg/l	0.14	0.18	0.14	0.16	0.24	0.22	1.5
BOD	mg/l	2.5	2.6	2.5	BDL	BDL	BDL	3
DO	mg/l	5.5	5.4	5.5	5.6	6.0	6.3	4
Gonua Nala DownStream								
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for Stream Water Standards
PH	-	6.8	6.9	6.88	6.62	6.76	6.83	6.5-8.5
Total Dissolved Solids	mg/l	152.0	172.0	152.0	210.0	204.0	212.0	1500
Chlorides	mg/l	24.0	32.0	17.0	18.0	16.0	14.0	600
Iron	mg/l	0.10	0.12	0.12	0.18	0.07	0.10	50
Fluorides	mg/l	0.28	0.29	0.16	0.24	0.21	0.24	1.5
BOD	mg/l	3.0	8.0	8.6	8.2	2.0	2.2	3
DO	mg/l	5.6	5.2	4.6	5.2	5.8	6.0	4



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Kakarpani Nala Upstream								
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for Stream Water Standards
PH	-	7.12	7.24	7.20	7.60	7.56	7.42	6.5-8.5
Total Dissolved Solids	mg/l	151.0	162.0	156.0	166.0	172.0	166.0	1500
Chlorides	mg/l	18.0	24.0	24.0	20.0	23.0	20.0	600
Iron	mg/l	0.10	0.12	0.13	0.16	0.12	0.10	50
Fluorides	mg/l	0.10	0.14	0.24	0.28	0.21	0.18	1.5
BOD	mg/l	1.8	2.0	3.0	5.6	5.2	5.5	3
DO	mg/l	6.4	6.0	6.4	6.6	6.2	6.4	4
Kakarpani Nala Downstream								
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Limits for Stream Water Standards
PH	-	6.7	6.8	6.7	6.8	7.24	7.19	6.5-8.5
Total Dissolved Solids	mg/l	172.0	182.0	162.	230.0	224.0	209.0	1500
Chlorides	mg/l	32.0	36.0	24.0	28.0	28.0	20.0	600
Iron	mg/l	0.12	0.12	0.13	0.14	0.18	0.16	50
Fluorides	mg/l	0.13	0.16	0.24	0.28	0.27	0.20	1.5
BOD	mg/l	4.4	4.6	12.0	16.0	8.2	9.0	3
DO	mg/l	5.4	5.9	5.10	4.9	5.9	6.2	4

7. Surface Water Flow Rate

LOCATION NAME	April-22	May-22	June-22	July-22	August-22	September-22
Gonua nala	0.50	0.71	0.41	0.71	0.63	0.35
Kakarpani nala	0.51	0.99	0.26	0.99	0.64	0.35



GONUA IRON ORE MINE

8. Ground Water Quality

Location		Gonua Village	Canabeda Village	Minjoda Village	Doughar Village
Parameter	Units	June-22			
pH	-	5.75	6.72	6.36	6.39
Total Dissolved Solids as TDS	mg/l	108.0	148.0	324.0	268.0
Total Hardness as CaCO ₃	mg/l	52.0	64.0	160.0	132.0
Sulfate as SO ₄	mg/l	5.80	6.20	10.5	12.5
Chloride as Cl	mg/l	10.0	14.0	18.0	16.0
Fluorides as F	mg/l	0.14	0.17	0.22	0.18
Iron as Fe	mg/l	0.10	0.07	0.14	0.16
Location		Gonua Village	Canabeda Village	Minjoda Village	Doughar Village
Parameter	Units	August-22			
pH	-	6.61	6.73	6.79	6.77
Total Dissolved Solids as TDS	mg/l	86.9	114.0	116.0	103.0
Total Hardness as CaCO ₃	mg/l	44.0	52.0	72.0	60.0
Sulfate as SO ₄	mg/l	8.32	16.5	21.6	19.5
Chloride as Cl	mg/l	8.0	14.0	18.0	16.0
Fluorides as F	mg/l	0.11	0.30	0.27	0.20
Iron as Fe	mg/l	BDL	0.12	0.20	0.06

9. Drinking Water Quality

Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Acceptable Limits	Permissible Limits
pH	-	6.65	6.82	6.95	6.90	6.79	7.08	6.5-8.5	No Relaxation
Total Dissolved Solids as TDS	mg/l	46.0	68.0	120.0	184.0	192.0	203.0	200	600
Total Hardness as CaCO ₃	mg/l	20.0	36.0	60.0	66.0	69.0	72.0	1	No Relaxation
Sulfate as SO ₄	mg/l	7.11	8.60	7.50	12.0	11.20	10.6	250	1000
Chloride as Cl	mg/l	8.0	12.0	10.0	8.0	7.60	8.0	500	2000
Fluorides as F	mg/l	0.22	0.24	0.22	0.20	0.22	0.20	200	400
Iron as Fe	mg/l	0.12	0.16	0.15	0.12	0.11	0.09	1	1.5



10. ETP

Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Acceptable Limits
ETP Inlet								
pH	-	7.34	7.28	5.65	6.24	6.48	6.67	6.5-9.0
Total Suspended Solid as TSS	mg/l	36.3	40.0	42.0	40.0	42.0	34.5	100.0
Total Dissolved Solids as TDS	mg/l	1102.0	1114.0	580.0	610.0	620.0	612.0	-
Biochemical Oxygen Demand as BOD 3days at 27°C	mg/l	9.0	8.6	26.0	32.0	34.0	35.0	30.0
Chemical Oxygen Demand as COD	mg/l	80.0	88.0	244.0	256.0	260.0	248.0	250.0
Oil & Grease as O & G	mg/l	5.5	5.8	6.4	6.2	6.80	8.45	10.0
Parameter	Units	April-22	May-22	June-22	July-22	August-22	September-22	Acceptable Limits
ETP Outlet								
pH	-	6.86	6.92	7.36	7.62	7.36	7.32	6.5-9.0
Total Suspended Solid as TSS	mg/l	74.6	82.0	22.0	28.0	26.80	23.3	100.0
Total Dissolved Solids as TDS	mg/l	1276.0	1284.0	560.0	524.0	514.0	523.0	-
Biochemical Oxygen Demand as BOD 3days at 27°C	mg/l	30.0	36	21.0	22.0	24.00	22.0	30.0
Chemical Oxygen Demand as COD	mg/l	243.0	254.0	172.0	152.0	138.0	144.0	250.0
Oil & Grease as O & G	mg/l	7.8	9.20	BDL	BDL	BDL	BDL	10.0

11. Mines Run Off

Parameter	Unit	July-22		August-22		September-22		INDIAN STANDARDS as IS-2296(C)
		Haulage Road	Mine Office	Haulage Road	Mine Office	Haulage Road	Mine Office	
Colour	Hazen	25.0	35.0	20.0	25.0	25.0	20.0	300
pH	-	7.19	7.22	7.20	7.23	7.45	7.33	6.5-8.5
Total Suspended Solids as TSS	mg/l	39.5	54.2	40.0	56.0	42.8	52.8	-

**GONUA IRON ORE MINE**

Total Dissolved Solids as TDS	mg/l	223.0	270.0	214.0	256.0	234.0	277.0	1500
Biochemical Oxygen Demand as BOD	mg/l	18.0	12.0	20.0	10.0	24.0	14.0	3.0
Chemical Oxygen Demand as COD	mg/l	136.0	116.0	128.0	108.0	144.0	124.0	-
Oil & Grease as O&G	mg/l	5.1	5.3	5.80	6.80	5.5	7.0	0.1
Dissolved Oxygen as DO	mg/l	4.8	5.1	5.60	5.40	5.2	5.9	4
Chloride as Cl	mg/l	22.0	26.0	23.0	21.80	20.0	20.0	600
Sulfate as SO4	mg/l	15.2	18.3	16.0	15.60	27.3	19.3	400
Nitrate Nitrogen as NO3	mg/l	6.7	7.54	8.20	8.20	9.32	8.22	50
Fluorides as F	mg/l	0.22	0.23	0.24	0.21	0.27	0.25	1.5
Iron as Fe	mg/l	0.13	0.15	0.17	0.18	0.22	0.13	50.0
Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.2
Hexavalent Chromium as Cr+6	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	1.5
Zinc as Zn	mg/l	0.10	0.11	0.15	0.13	0.12	0.10	15
Phenolic Compound as C6H5OH	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.005
Anionic Detergent as MBAS	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	1.0
Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05
Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.1
Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.01

12. Vibration Monitoring

Sl no.	Station Name	Instrument location	Season (Summer/Winter/Monsoon/post monsoon)	Peak particle velocity	Air Over pressure	Frequency	Remark
1	Bottom Bench	Near WB-1 (200m away from blasting location)	Summer	1.3 mm/s	127.9 dBL @ 42.6Hz / .0495kPa	11.4 Hz	Within Permissible limits
2	8 th No Bench Pit Area	Near Rest Shelter (150m away from blasting location)	Monsoon	2.21 mm/s	88.0 dBL @ 0 Hz at 0.0005 kPa	0.2 Hz	Within Permissible limits
				1.69 mm/s	88.0 dBL @ 0 Hz at 0.0005 Kpa	0.2 Hz	
3	6 th And 7 th Bench from Top	Near Rest Shelter (150m away from blasting location)	Monsoon	3.06 mm/s	88.0 dBL @ 0 Hz at 0.0005 kPa	4.6 Hz	Within Permissible limits
4	RL-653, RL-644	Opposite of Garage area (150m away from blasting location)	Monsoon	1.21 mm/s	125.1 dBL @ 9.3Hz / .036kPa	1.8 Hz	Within Permissible limits
				1.32 mm/s	103.5 dBL @ 4Hz / .003kPa	0.7 Hz	
5	5 th And 7 th Bench	Garage area (150m away from blasting location)	Monsoon	5.19 mm/s	123.9 dBL @ 9.6Hz / .0315kPa	7.4 Hz	Within Permissible limits

Verified By

Hikash Kumar
Technical Manager

Authorized By

Reena
Quality Manager

—End of Report—

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

TEST REPORT

FORMAT NO. ECO/QS/FORMAT/09

NAME & ADDRESS OF CUSTOMER:	Gunua Iron Ore Mines of M/s JSW Steel Ltd.	Test Report No.	ECOLAB/GW/0593/5169/08/2022
		Issue Date of Test Report	03.09.2022
Type of Sample	Ground Water		
Sample Registration No.	593	Name of Location	Minjoda Village
Sampling Method	As per Reference Method	Sample Collected By	Ecomen Lab Team
Date of Sample Collection	09.08.2022	Time of Sample Collection	-
Date of Sample Received	15.08.2022	Time of Sample Received	12:45 PM
Start Date of Analysis	16.08.2022	End Date of Analysis	30.08.2022
Laboratory Environmental Condition	Temperature: 25 ± 2 °C	Sample Quantity	As per Requirement
	Humidity: 63 %	Sample ID Code	ECO/LAB/5169/08/2022

Sl. No.	TESTS	Unit	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:2012 (Reaff:2018)	
						Desirable	Permissible
1.	Colour	Hazen	APHA, 23 rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	-	APHA, 23 rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	-	APHA, 23 rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as	NTU	APHA, 23 rd Ed. 2017, 2130-A+B	BDL	1 - 100	1.0	5.0
5.	pH	-	APHA, 23 rd Ed. 2017, 4500H+ A+B	6.79	2.0 -12	6.5-8.5	No Relax.
6.	Total Suspended Solids as TSS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	BDL	5 - 5000	-	-
7.	Total Dissolved Solids as TDS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	116.0	5 - 5000	500	2000
8.	Total Alkalinity	mg/l	APHA, 23 rd Ed. 2017, 2320 A+ B	60.0	5-1500	200	600
9.	Total Hardness as CaCO ₃	mg/l	APHA, 23 rd Ed. 2017, 2340 A+C	72.0	5-1500	200.0	600.0
10.	Calcium as Ca	mg/l	APHA, 23 rd Ed. 2017, 3500 Ca A+B	16.0	5 - 1000	75.0	200.0
11.	Magnesium as Mg	mg/l	APHA, 23 rd Ed. 2017, 3500 Mg A+B	7.77	5-1000	30.0	100.0
12.	Sulfate as SO ₄	mg/l	APHA, 23 rd Ed. 2017, 4500-SO ₄ ²⁻ E	21.6	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃	mg/l	APHA, 23 rd Ed. 2017, 4500-NO ₃ ⁻ B	7.8	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl	mg/l	APHA, 23 rd Ed. 2017, 4500 Cl A+B	18.0	5-1000	250.0	1000.0
15.	Fluorides as F	mg/l	APHA, 23 rd Ed. 2017, 4500-C	0.27	0.05-10	1.0	1.5
16.	Copper as Cu	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
17.	Iron as Fe	mg/l	APHA, 23 rd Ed. 2017, 3500 Fe B	0.20	0.02-50	0.3	No Relax.
18.	Manganese as Mn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As	mg/l	APHA, 23 rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	0.10	0.02-50	5.0	15
21.	Total Chromium as Cr	mg/l	APHA, 23 rd Ed. 2017, 3111A+B	BDL	0.05-20	0.05	No Relax.
22.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 2017, 5530 A+C	BDL	1-10	0.593	0.002
23.	Free Residual Chlorine	mg/l	APHA, 23 rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
24.	Selenium as Se	mg/l	APHA, 23 rd Ed. : 2017, 3500 Se A+C	BDL	0.02-10	0.01	No Relax
25.	Aluminum as Al	mg/l	APHA, 23 rd Ed. : 2017, 3500 Al A+B	BDL	0.2-100	0.03	0.2
26.	Mercury as Hg	mg/l	APHA, 23 rd Ed. : 2017, 3112 A+B	BDL	0.593-1	0.593	No Relax
27.	Lead as Pb	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.01-1	0.01	No Relax
28.	Cadmium as Cd	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
29.	Boron as B	mg/l	APHA, 23 rd Ed. : 2017, 4500 B A+C	0.21	0.2-10	0.5	1.0
30.	Cyanide as CN	mg/l	APHA, 23 rd Ed. 2017, 4500 ,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	mg/l	IS 3025 (Part 39) Class -6	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MABS	mg/l	APHA, 23 rd Ed. 2017, 5540 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hydrocarbon as PAH	mg/l	APHA, 23 rd Ed. 2017, 6440 A+B	BDL	0.0593-2	0.0593	No Relax.
34.	E. Coli	cfu/100 ml	APHA, 23 rd Ed. : 2017, 9221 A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note:** - BDL- Below Detection Limit

Verified By

Hikash Kumar
Technical Manager

Authorized By

Reena
Quality Manager

—End of Report—

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TEST REPORT

FORMAT NO. ECO/QS/FORMAT/09

NAME & ADDRESS OF CUSTOMER:	Gunua Iron Ore Mines of M/s JSW Steel Ltd.	Test Report No.	ECOLAB/GW/0593/5167/08/2022
		Issue Date of Test Report	03.09.2022
Type of Sample	Ground Water		
Sample Registration No.	593	Name of Location	Gonua Village
Sampling Method	As per Reference Method	Sample Collected By	Ecomen Lab Team
Date of Sample Collection	09.08.2022	Time of Sample Collection	-
Date of Sample Received	15.08.2022	Time of Sample Received	12:45 PM
Start Date of Analysis	16.08.2022	End Date of Analysis	30.08.2022
Laboratory Environmental Condition	Temperature: 25 ± 2 °C	Sample Quantity	As per Requirement
	Humidity: 63 %	Sample ID Code	ECO/LAB/5167/08/2022

Sl. No.	TESTS	Unit	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:2012(Reaff:2018)	
						Desirable	Permissible
1.	Colour	Hazen	APHA, 23 rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	-	APHA, 23 rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	-	APHA, 23 rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as	NTU	APHA, 23 rd Ed. 2017, 2130-A+B	BDL	1 - 100	1.0	5.0
5.	pH	-	APHA, 23 rd Ed. 2017, 4500H+ A+B	6.61	2.0 -12	6.5-8.5	No Relax.
6.	Total Suspended Solids as TSS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	BDL	5 - 5000	-	-
7.	Total Dissolved Solids as TDS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	86.9	5 - 5000	500	2000
8.	Total Alkalinity	mg/l	APHA, 23 rd Ed. 2017, 2320 A+ B	24.0	5-1500	200	600
9.	Total Hardness as CaCO ₃	mg/l	APHA, 23 rd Ed. 2017, 2340 A+C	44.0	5-1500	200.0	600.0
10.	Calcium as Ca	mg/l	APHA, 23 rd Ed. 2017, 3500 Ca A+B	8.0	5 – 1000	75.0	200.0
11.	Magnesium as Mg	mg/l	APHA, 23 rd Ed. 2017, 3500 Mg A+B	4.86	5-1000	30.0	100.0
12.	Sulfate as SO ₄	mg/l	APHA, 23 rd Ed. 2017, 4500-SO ₄ ²⁻ E	8.32	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃	mg/l	APHA, 23 rd Ed. 2017, 4500-NO ₃ ⁻ B	5.01	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl	mg/l	APHA, 23 rd Ed. 2017, 4500 Cl A+B	8.0	5-1000	250.0	1000.0
15.	Fluorides as F	mg/l	APHA, 23 rd Ed. 2017, 4500-C	0.11	0.05-10	1.0	1.5
16.	Copper as Cu	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
17.	Iron as Fe	mg/l	APHA, 23 rd Ed. 2017, 3500 Fe B	BDL	0.02-50	0.3	No Relax.
18.	Manganese as Mn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As	mg/l	APHA, 23 rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	0.04	0.02-50	5.0	15
21.	Total Chromium as Cr	mg/l	APHA, 23 rd Ed. 2017, 3111A+B	BDL	0.05-20	0.05	No Relax.
22.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 2017, 5530 A+C	BDL	1-10	0.593	0.002
23.	Free Residual Chlorine	mg/l	APHA, 23 rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
24.	Selenium as Se	mg/l	APHA, 23 rd Ed. : 2017, 3500 Se A+C	BDL	0.02-10	0.01	No Relax
25.	Aluminum as Al	mg/l	APHA, 23 rd Ed. : 2017, 3500 Al A+B	BDL	0.2-100	0.03	0.2
26.	Mercury as Hg	mg/l	APHA, 23 rd Ed. : 2017, 3112 A+B	BDL	0.593-1	0.593	No Relax
27.	Lead as Pb	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.01-1	0.01	No Relax
28.	Cadmium as Cd	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
29.	Boron as B	mg/l	APHA, 23 rd Ed. : 2017, 4500 B A+C	0.21	0.2-10	0.5	1.0
30.	Cyanide as CN	mg/l	APHA, 23 rd Ed. 2017, 4500 ,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	mg/l	IS 3025 (Part 39) Class -6	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MABS	mg/l	APHA, 23 rd Ed. 2017, 5540 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hydrocarbon as PAH	mg/l	APHA, 23 rd Ed. 2017, 6440 A+B	BDL	0.0593-2	0.0593	No Relax.
34.	E. Coli	cfu/100 ml	APHA, 23 rd Ed. : 2017, 9221 A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note:** - BDL- Below Detection Limit

Verified By

Hikash Kumar
Technical Manager

Authorized By

Reena
Quality Manager

—End of Report—

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TEST REPORT

FORMAT NO. ECO/QS/FORMAT/09

NAME & ADDRESS OF CUSTOMER:	Gunua Iron Ore Mines of M/s JSW Steel Ltd.	Test Report No.	ECOLAB/GW/0593/5168/08/2022
		Issue Date of Test Report	03.09.2022
Type of Sample	Ground Water		
Sample Registration No.	593	Name of Location	Canabeda Village
Sampling Method	As per Reference Method	Sample Collected By	Ecomen Lab Team
Date of Sample Collection	09.08.2022	Time of Sample Collection	-
Date of Sample Received	15.08.2022	Time of Sample Received	12:45 PM
Start Date of Analysis	16.08.2022	End Date of Analysis	30.08.2022
Laboratory Environmental Condition	Temperature: 25 ± 2 °C	Sample Quantity	As per Requirement
	Humidity: 63 %	Sample ID Code	ECO/LAB/5168/08/2022

Sl. No.	TESTS	Unit	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:2012(Reaff:2018)	
						Desirable	Permissible
1.	Colour	Hazen	APHA, 23 rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	-	APHA, 23 rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	-	APHA, 23 rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as	NTU	APHA, 23 rd Ed. 2017, 2130-A+B	BDL	1 - 100	1.0	5.0
5.	pH	-	APHA, 23 rd Ed. 2017, 4500H+ A+B	6.73	2.0 -12	6.5-8.5	No Relax.
6.	Total Suspended Solids as TSS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	BDL	5 - 5000	-	-
7.	Total Dissolved Solids as TDS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	114.0	5 - 5000	500	2000
8.	Total Alkalinity	mg/l	APHA, 23 rd Ed. 2017, 2320 A+B	40.0	5-1500	200	600
9.	Total Hardness as CaCO ₃	mg/l	APHA, 23 rd Ed. 2017, 2340 A+C	52.0	5-1500	200.0	600.0
10.	Calcium as Ca	mg/l	APHA, 23 rd Ed. 2017, 3500 Ca A+B	14.4	5 - 1000	75.0	200.0
11.	Magnesium as Mg	mg/l	APHA, 23 rd Ed. 2017, 3500 Mg A+B	3.88	5-1000	30.0	100.0
12.	Sulfate as SO ₄	mg/l	APHA, 23 rd Ed. 2017, 4500-SO ₄ ²⁻ E	16.5	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃	mg/l	APHA, 23 rd Ed. 2017, 4500-NO ₃ ⁻ B	6.78	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl	mg/l	APHA, 23 rd Ed. 2017, 4500 Cl A+B	14.0	5-1000	250.0	1000.0
15.	Fluorides as F	mg/l	APHA, 23 rd Ed. 2017, 4500-C	0.30	0.05-10	1.0	1.5
16.	Copper as Cu	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
17.	Iron as Fe	mg/l	APHA, 23 rd Ed. 2017, 3500 Fe B	0.12	0.02-50	0.3	No Relax.
18.	Manganese as Mn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As	mg/l	APHA, 23 rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	0.06	0.02-50	5.0	15
21.	Total Chromium as Cr	mg/l	APHA, 23 rd Ed. 2017, 3111A+B	BDL	0.05-20	0.05	No Relax.
22.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 2017, 5530 A+C	BDL	1-10	0.593	0.002
23.	Free Residual Chlorine	mg/l	APHA, 23 rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
24.	Selenium as Se	mg/l	APHA, 23 rd Ed. : 2017, 3500 Se A+C	BDL	0.02-10	0.01	No Relax
25.	Aluminum as Al	mg/l	APHA, 23 rd Ed. : 2017, 3500 Al A+B	BDL	0.2-100	0.03	0.2
26.	Mercury as Hg	mg/l	APHA, 23 rd Ed. : 2017, 3112 A+B	BDL	0.593-1	0.593	No Relax
27.	Lead as Pb	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.01-1	0.01	No Relax
28.	Cadmium as Cd	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
29.	Boron as B	mg/l	APHA, 23 rd Ed. : 2017, 4500 B A+C	0.21	0.2-10	0.5	1.0
30.	Cyanide as CN	mg/l	APHA, 23 rd Ed. 2017, 4500 ,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	mg/l	IS 3025 (Part 39) Class -6	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MABS	mg/l	APHA, 23 rd Ed. 2017, 5540 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hydrocarbon as PAH	mg/l	APHA, 23 rd Ed. 2017, 6440 A+B	BDL	0.0593-2	0.0593	No Relax.
34.	E. Coli	cfu/100 ml	APHA, 23 rd Ed. : 2017, 9221 A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note:** - BDL- Below Detection Limit

Verified By

Hikash Kumar
Technical Manager

Authorized By

Reena
Quality Manager

—End of Report—

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LABORATORIES PVT LTD.

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

TEST REPORT

FORMAT NO. ECO/QS/FORMAT/09

NAME & ADDRESS OF CUSTOMER:	Gunua Iron Ore Mines of M/s JSW Steel Ltd.	Test Report No.	ECOLAB/GW/0593/5170/08/2022
		Issue Date of Test Report	03.09.2022
Type of Sample	Ground Water		
Sample Registration No.	593	Name of Location	Doughar Village
Sampling Method	As per Reference Method	Sample Collected By	Ecomen Lab Team
Date of Sample Collection	09.08.2022	Time of Sample Collection	-
Date of Sample Received	15.08.2022	Time of Sample Received	12:45 PM
Start Date of Analysis	16.08.2022	End Date of Analysis	30.08.2022
Laboratory Environmental Condition	Temperature: 25 ± 2 °C	Sample Quantity	As per Requirement
	Humidity: 63 %	Sample ID Code	ECO/LAB/5170/08/2022

Sl. No.	TESTS	Unit	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:2012 (Reaff:2018)	
						Desirable	Permissible
1.	Colour	Hazen	APHA, 23 rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	-	APHA, 23 rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	-	APHA, 23 rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as	NTU	APHA, 23 rd Ed. 2017, 2130-A+B	BDL	1 - 100	1.0	5.0
5.	pH	-	APHA, 23 rd Ed. 2017, 4500H+ A+B	6.77	2.0 -12	6.5-8.5	No Relax.
6.	Total Suspended Solids as TSS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	BDL	5 - 5000	-	-
7.	Total Dissolved Solids as TDS	mg/l	APHA, 23 rd Ed. 2017, 2540-C	103.0	5 - 5000	500	2000
8.	Total Alkalinity	mg/l	APHA, 23 rd Ed. 2017, 2320 A+ B	52.0	5-1500	200	600
9.	Total Hardness as CaCO ₃	mg/l	APHA, 23 rd Ed. 2017, 2340 A+C	60.0	5-1500	200.0	600.0
10.	Calcium as Ca	mg/l	APHA, 23 rd Ed. 2017, 3500 Ca A+B	12.8	5 - 1000	75.0	200.0
11.	Magnesium as Mg	mg/l	APHA, 23 rd Ed. 2017, 3500 Mg A+B	6.80	5-1000	30.0	100.0
12.	Sulfate as SO ₄	mg/l	APHA, 23 rd Ed. 2017, 4500-SO ₄ ²⁻ E	19.5	1.0 -250	200.0	400.0
13.	Nitrate Nitrogen as NO ₃	mg/l	APHA, 23 rd Ed. 2017, 4500-NO ₃ ⁻ B	7.4	5.0 - 100	45.0	No Relax.
14.	Chloride as Cl	mg/l	APHA, 23 rd Ed. 2017, 4500 Cl A+B	16.0	5-1000	250.0	1000.0
15.	Fluorides as F	mg/l	APHA, 23 rd Ed. 2017, 4500-C	0.20	0.05-10	1.0	1.5
16.	Copper as Cu	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
17.	Iron as Fe	mg/l	APHA, 23 rd Ed. 2017, 3500 Fe B	0.06	0.02-50	0.3	No Relax.
18.	Manganese as Mn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
19.	Arsenic as As	mg/l	APHA, 23 rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
20.	Zinc as Zn	mg/l	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.02-50	5.0	15
21.	Total Chromium as Cr	mg/l	APHA, 23 rd Ed. 2017, 3111A+B	BDL	0.05-20	0.05	No Relax.
22.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA, 23 rd Ed. 2017, 5530 A+C	BDL	1-10	0.593	0.002
23.	Free Residual Chlorine	mg/l	APHA, 23 rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
24.	Selenium as Se	mg/l	APHA, 23 rd Ed. : 2017, 3500 Se A+C	BDL	0.02-10	0.01	No Relax
25.	Aluminum as Al	mg/l	APHA, 23 rd Ed. : 2017, 3500 Al A+B	BDL	0.2-100	0.03	0.2
26.	Mercury as Hg	mg/l	APHA, 23 rd Ed. : 2017, 3112 A+B	BDL	0.593-1	0.593	No Relax
27.	Lead as Pb	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.01-1	0.01	No Relax
28.	Cadmium as Cd	mg/l	APHA, 23 rd Ed. : 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
29.	Boron as B	mg/l	APHA, 23 rd Ed. : 2017, 4500 B A+C	0.21	0.2-10	0.5	1.0
30.	Cyanide as CN	mg/l	APHA, 23 rd Ed. 2017, 4500 ,CN A+D	BDL	0.005-5	0.05	No Relax
31.	Mineral Oil	mg/l	IS 3025 (Part 39) Class -6	BDL	0.01-10	0.5	No Relax.
32.	Anionic detergent as MABS	mg/l	APHA, 23 rd Ed. 2017, 5540 A+C	BDL	0.01-5	0.2	1.0
33.	Polynuclear aromatic hydrocarbon as PAH	mg/l	APHA, 23 rd Ed. 2017, 6440 A+B	BDL	0.0593-2	0.0593	No Relax.
34.	E. Coli	cfu/100 ml	APHA, 23 rd Ed. : 2017, 9221 A+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per IS-10500-2012 (Reaff.-2018) limits for above tested parameters and the results are related to the sample tested. **Note:** - BDL- Below Detection Limit.

Verified By

Hikash Kumar
Technical Manager

Authorized By

Reena
Quality Manager

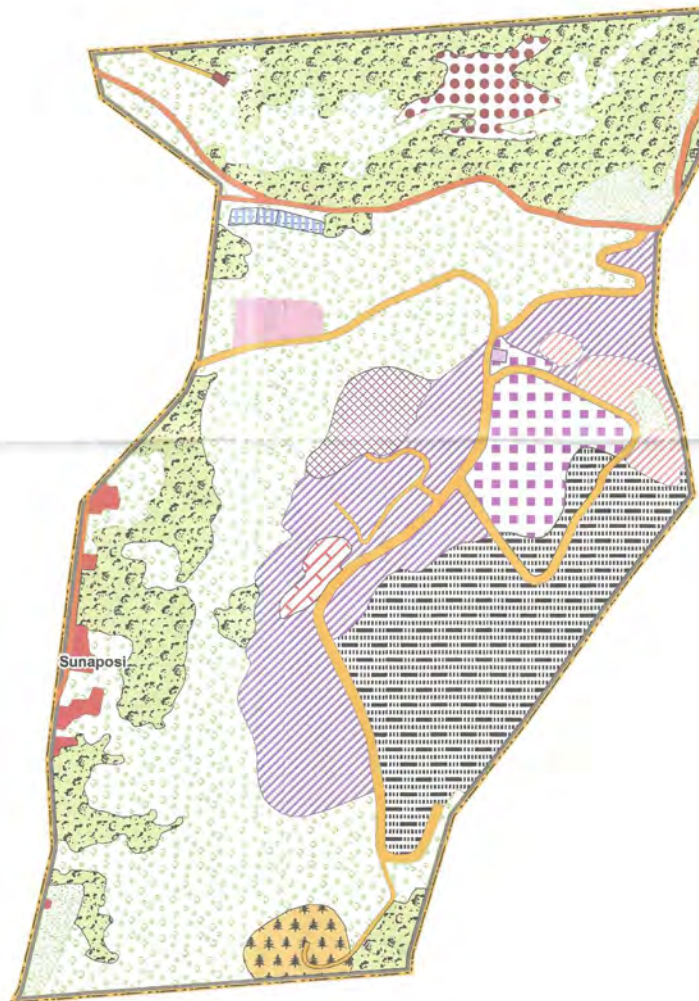
—End of Report—

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LANDUSE / LANDCOVER MAP OF GANUA IRON ORE MINE IN SUNDERGARH DISTRICT OF M/S JSW STEEL LTD.

0 0.15 0.3 0.6 Kilometers

SCALE - 1:5,000



Legend

- Habitation
- Plantation Over Dump
- Tree Clad Area
- Tree Felling Area
- Land With Scrub
- Land Without Scrub
- Mining Quarry
- Old Quarry
- Sub - Grade Dump
- OB Dump
- Stock Yard / Ore Stack
- Settling Pond
- Site Services
- Workshop
- Processing Yard
- Weigh Bridge
- Magazine
- Haul Road
- Other Road
- Safety Zone
- Mining Lease Boundary



SOURCE : -

Drone Image Supplied By M/s JSW Steel Ltd.
Month - August , Year - 2021

