



स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड  
STEEL AUTHORITY OF INDIA LIMITED  
रॉ मटेरियल्स डिवीज़न  
RAW MATERIALS DIVISION

Ref No: - BOM/ENV/6.9/IID-1811

Date:-18/11/2019

To,

Additional Principal Chief Conservator of Forests (C),  
Ministry of Environment, Forest and Climate Change,  
Regional Office (EZ),  
A/3, Chandrasekharpur,  
Bhubaneswar – 751023

**Sub: Six monthly status of compliance to the conditions stipulated in the Environmental Clearance granted by MoEFCC for 15000 TPA Manganese Ore production from 6.90 sq. Miles ML vide letter no. J-11015/396/2008-IA.II(M) dated 21/12/2012 for the period APR'19 SEP'19**

Sir,

Please find enclosed herewith the Six monthly compliance report for the period APR'19 - SEP'19 with respect to the conditions stipulated by GoI, MoEF, New Delhi, in the Environmental Clearance grant order of Bolani Ores Mines for the production of 15000 TPA Manganese Ore from 6.90 sq Miles ML vide ministry's letter no. J-11015/396/2008 IA.II(M) dated 21/12/2012. The report also contains the updated status of the environmental monitoring reports pertaining to the above period.

Thank you.

Yours faithfully,

**Chief General Manager  
Bolani Ores Mines**

A. K. Mishra  
CGM (Mines), BOM

Encl: As above

Copy:

1. Director, IA Division, MoEF&CC, GOI, Indira Paryavaran Bhavan, Aliganj, Jor Bagh Road, New Delhi - 110 003,
2. In-charge, Eastern Zone, CPCB, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.)
3. The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilkantha Naga, Unit - VIII, Bhubaneswar - 751 012, Odisha

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड, रॉ मटेरियल्स डिवीज़न, बोलानी अयस्क खदान, पोस्ट : बोलानी - 758037 जिला - क्योंझर, उड़ीसा  
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**Six Monthly**  
COMPLIANCE REPORT OF  
ENVIRONMENTAL CLEARANCE CONDITIONS  
(Grant Order no: J-11015/396/2008-IA.II(M) dated 21/12/2012 )  
OF  
BOLANI ORES MINES (6.90 Sq Miles ML) In Keonjhar  
District of Odisha

For the Period April'19 - September'19



STEEL AUTHORITY OF INDIA LIMITED  
RAW MATERIALS DIVISION  
BOLANI ORES MINES  
BOLANI- 758037

Sl. No.	CONDITION	COMPLIANCE
A.	<b>SPECIFIC CONDITIONS</b>	
i.	<b>Environmental Clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as applicable.</b>	Not Applicable as the Provision of Wildlife (Protection) ACT 1972 is not attracted to the Project.
ii.	<b>The mining operation shall be restricted to above ground water table and it shall not intersect groundwater table. In case of working below the ground water table, Prior approval of the Ministry of Environment &amp; Forest and Central Ground Water Authority shall be obtained for which a detailed hydrogeological study shall be carried out.</b>	The Mining operations in this ML have not been commenced yet. In case of working below the ground water table, a detailed hydrogeological study will be carried out and prior approval of the Ministry of Environment & Forest and Central Ground Water Authority will be obtained for working below Ground Water Table.
iii.	<b>Mitigation measures to control RSPM levels shall continue to be implemented and air quality data will also be collected during operation of the mines. The data so collected shall be analyzed to see the effectiveness of the mitigation measures implemented. Based on the same, additional safeguard measures, as may be required shall be implemented in the project.</b>	<p>The Mining operations in this ML have not started yet. Mitigation measures are regularly implemented to control the RSPM levels. On production of ROM from this lease, total dispatch will be through rail route. As such, in order to improve the RSPM quality, SAIL-Bolani Ore Mines has completed the implementation of following mitigation measures :</p> <ul style="list-style-type: none"> <li>(a) Repaired and blacktopped the Road from Karo Bridge to Bolani entry point (3.2 km) at a cost of Rs.732 lakhs.</li> <li>(b) Repaired and blacktopped the Balagoda - Bolani road (2.4 km) at a cost of Rs.20 lakhs.</li> <li>(c) Dry Fog Dust suppression system has been installed in the 600 TPH Crushing &amp; Screening Plant</li> <li>(d) In addition to water sprinkling on haul roads, water sprinkling facility has been extended to the Public roads outside this lease.</li> <li>(e) Fixed water sprinkling system has been installed in the 600 TPH areas.</li> <li>(f) During ROM production from this ML, additional water sprinkling measures as planned in EMP will be undertaken.</li> </ul> <p>Regular Environmental Audits are part of the Environmental Management System (EMS) implemented at Bolani Ore Mines, which is certified under ISO-14001:2015 standard. These audits check the conformance of the air quality to the applicable</p>

Sl. No.	CONDITION	COMPLIANCE
		norms and thereby effectiveness of the pollution control equipment / facilities is regularly reviewed for taking up any additional safeguard measures, if any required.
iv.	<b>The biological survey shall be repeated during October-December and mid-May month to see the existence of wildlife corridors, if any. Based on the same, necessary Wildlife Conservation Plan as may be required shall be prepared and implemented in consultation with the state Forest and Wildlife Department.</b>	Necessary biological surveys were conducted by expert committees and Wild Life Experts and based on the same, Site Specific Wildlife Conservation Plan has been prepared and approved by the state Forest and Wildlife Department vide order no 10680/1WL-FC-Mrl-SSP-228/2018 Dt. 22.11.2018 with a total financial outlay of Rs.1088.431 lakhs. An amount of Rs.772.999 lakhs has been deposited in CAMPA account of Forest Dept. for interventions in Project impact area. The Study revealed no Wildlife corridors within the Mining Lease area.
v.	<b>The biological survey shall also be undertaken to identify the trees with orchids, if any Such trees, so identified shall be protected and if need be, these trees may be relocated.</b>	Detailed study of the area for identification of orchids completed by the Consutant, M/s Grow Green Consortium Pvt. Ltd. A Report based on survey including recommendations for preservation of the species has been submitted at regional office of MoEF&CC vide our letter no. BOM/ENV/HD-1707A dt. 17.07.2019.
vi.	<b>The Over Burden (OB) generated during the mining operation shall be stacked at earmarked dump sites(s) only and should not be kept active for long period. In critical areas, use of geo textiles shall be undertaken for stabilization of dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment &amp; Forest and its Regional Office located at Bhubaneswar on six monthly basis.</b>	Noted for Compliance.
vii.	<b>Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from mine working, soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc.. The</b>	The Mining operations in this ML have not started yet. Therefore, no silt is generated from the Mine working. However, above measures will be undertaken as soon as the Mining operations are started.

Sl. No.	CONDITION	COMPLIANCE
	drains should be regularly de-silted particularly after monsoon and maintained properly.	
viii.	<b>Dimension of retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data</b>	The Mining operations in this ML have not started yet. Dimension of retaining walls to be constructed to check run-off and siltation will be based on Rainfall data and as per approved mining plan.
ix.	<b>The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant, leopard, sloth bear, wolf, gaur, python etc. Spotted in the study area and contribute towards the cost of implementation of the plan and/ or Regional Wild life Management plan for conservation of flora and fauna so prepared by the State Government. The amount so contributed shall be included in the project cost. A copy of action plan may be submitted to the Ministry and its Regional Office, Bhubaneswar within three months.</b>	<p>Necessary biological surveys were conducted by expert committees and Wild Life Experts and based on the same, Site Specific Wildlife Conservation Plan has been prepared and approved by the state Forest and Wildlife Department vide order no 10680/1WL-FC-Mrl-SSP-228/2018 Dt. 22.11.2018 with a total financial outlay of Rs.1088.431 lakhs. An amount of Rs.772.999 lakhs has been deposited in CAMPA account of Forest Dept. for interventions in Project impact area.</p> <p>The Study revealed no Wildlife corridors within the Mining Lease area.</p>
x.	<b>The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM 10 and NO<sub>x</sub> in the ambient air within the impact zone, peak particle velocity at 300 m 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</b>	<p>The Mining operation in this ML has not started yet. However, the critical parameters such as PM<sub>10</sub>, NO<sub>x</sub> etc. are regularly monitored in the ambient air within the impact zone. Action has been taken for installation of 4 (Four) nos) Continuous Ambient Air Quality Monitoring System (CAAQMS) in core and buffer zones of this lease for measurement critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM<sub>10</sub> and NO<sub>x</sub> in the ambient air within the impact zone.</p> <p>The quality of discharged water is also regularly monitored for parameters like TDS, DO, PH and Total Suspended Solids (TSS). The monitored data are enclosed in the six monthly compliance reports which are uploaded on the website of SAIL. The monitored data are also displayed on an electronic display board near the main entry gate which is in public domain.</p> <p>The monitoring reports are attached as <b>Annexure-I</b>.</p>

Sl. No.	CONDITION	COMPLIANCE
	Ministry of Environment and Forest, which is available on the website of the Ministry <a href="http://www.envfor.nic.in">www.envfor.nic.in</a> shall also be referred in this regard for the compliance.	
<b>B.</b>	<b>GENERAL CONDITIONS</b>	
i.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests	The Mining operation in this ML has not started yet. However, there will be no change in Mining technology or scope of work, other than that which has been prescribed in Mine Plan/Mining Scheme. Prior approval from MoEF&CC shall be sought to change Mining technology or scope of working.
ii.	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	No change in the calendar plan including excavation, quantum of mineral iron ore and waste will be made.
iii.	The project proponent shall obtain Consent to establish from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated there in.	Consent to Establish has been obtained vide Order no. 23403/Ind-II-NOC-5374 dt 21/12/2013. An application for revalidation of the CTE has been submitted vide no. 2476275 Dt. 04-03-2019. The conditions are effectively implemented and a compliance report has already been submitted to OSPCB for considering grant of consent to operate. The Mining operation in this ML has not started yet.
iv.	A final mine closure plan along with details of Corpus Fund should Be submitted to the Ministry of Environment & Forest 5 years in Advance of final mine closure for approval.	Final Mine Closure plan along with details of Corpus fund will be submitted to the Ministry 5 years in advance of final mine closure for approval. However, the Progressive Mine Closure Plan (PMCP) is approved by IBM vide their letter no. MS/OTFM/45-ORI/BHU/2017-18 Dt. 27.03.2018.
v.	The project proponent shall practice Suitable rain water harvesting measures on long term basis and work out detailed scheme rain water harvesting in consultation with Central Ground Water Authority and submit a copy of the same to the Ministry of Environment & Forests and its Regional Office, Bhubaneswar.	The Rainwater Harvesting measures proposed in report of “Technical Feasibility Study on Rain Water Harvesting & Master Plan for Ground Water Recharges” prepared by the consultant, M/s KRG Rainwater Foundation, have been approved by CGWB Bhubaneswar vide their letter no.: 5-22/ CGWA/SER/2018-19-1306 Dt. 26.12.2018. Meanwhile, departmental initiatives for Soil and moisture Conservation had been taken up, measures such as de-silting of network of seasonal water channels, Plantations of drought hardy plant species on the degraded lands, water harvesting structures along seasonal channels, have been taken up by Bolani Ore Mines, SAIL to augment ground water recharge, as per schemes prepared with in-house expertise, in line with

Sl. No.	CONDITION	COMPLIANCE
		prevailing guidelines of CGWB. Bolani Ore Mines is not using any ground water either for domestic purpose or for industrial purpose, neither has any plan to do so for future mining activities.
vi.	<b>Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of Mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.</b>	Not applicable at present as Mining operations in this ML has not started yet. However, the same will be complied, as soon as the Mining operation starts.
vii.	<b>No Blasting shall be carried out after the sunset. Blasting operation should be carried out only during the day time. Controlled Blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.</b>	Not applicable at present as Mining operations in this ML have not started yet. However, on commencement of mining operation, Blasting will be carried out only during the daytime and controlled blasting will be practiced, with due precaution to control ground vibrations and fly rocks and boulders.
viii.	<b>Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer point should also have efficient dust control arrangements. These should be properly maintained and operated.</b>	In the Mineral handling areas such as Loading plant area, High Pressure fixed dust suppression system in 600 TPH Plant and fixed water sprinkling systems have been provided.
ix.	<b>Sewage treatment plant should be installed for the colony. ETP should also be provided for the workshop and wastewater generated during mining operation.</b>	<p>Based on the conceptual plan submitted by IIT KGP a detail feasibility report (FR), Technical Specification (TS) for STP of capacity 2.4 MLD Capacity has been prepared by CET, an in-house consultant of SAIL for execution. Implementation period of the job is 24 months with an estimated cost of Rs. 17.56 Cr. The proposal is under tender process.</p> <p>Meanwhile, individual septic tanks followed by soaking pits have been provided in all quarters and office locations.</p> <p>3 nos. of ETPs (Oil and Grease catch traps) have been provided at mechanical workshops and equipment washing junctions, to collect and treat workshop effluent.</p>

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x.	<b>Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.</b>	All newly appointed workers undergo a comprehensive medical examination (Pre-Employment Medical Examination) and subsequently a Periodical Medical Examination (PME) at regular intervals. All workers undergo a PME every 5 years; however, for workers whose age is >45 years the PME is done every 3 years. All contractual workers also undergo medical examination. The findings are maintained in each worker's individual medical record maintained throughout his service. These records are manually maintained and also computerized. The above tests are carried out at the Bolani Mines Hospital. A three tier health monitoring program is in vogue the hospital. The mine's hospital has an Occupational Health Department O.P.D. run by Occupational Health Physician. The mine hospital is a 50 bedded multi-specialty hospital with facilities to handle major and minor surgeries and a casualty department.												
xi.	<b>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.</b>	Most of the labours engaged in the construction activity belong to nearby villages. However, provisions have also been made, as and when required, for the housing of construction labour in adjacent to the construction sites in non-forest lands on temporary basis till completion of the project. Infrastructure and facilities, available at Bolani such as safe drinking water, medical health care etc. are enjoyed by the labors.												
xii.	<b>Regular monitoring of ground water level and quality should be carried out in and around the mines lease by establishing a network of existing wells and installing new piezometers during the 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 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 Ministry of Environment and Forests and its Regional Office, Bhubaneswar, Central Ground</b>	<p>As per present practice, monitoring of ground water quality and levels of existing wells inside the ML area is done quarterly in the existing wells of Bolani and Balagoda Village and data is submitted in compliance reports. The ground water level data is as follows:</p> <table border="1"> <thead> <tr> <th>Village Name</th><th>Water Level (May'19) bgl</th><th>Water Level (Aug'19) bgl</th></tr> </thead> <tbody> <tr> <td>Bolani</td><td>4.1</td><td>1.4</td></tr> <tr> <td>Balagoda</td><td>6.84</td><td>1.8</td></tr> <tr> <td>Bolani Township</td><td>14.3</td><td>10.3</td></tr> </tbody> </table> <p>The water quality reports are enclosed as <b>Annexure-IB</b></p>	Village Name	Water Level (May'19) bgl	Water Level (Aug'19) bgl	Bolani	4.1	1.4	Balagoda	6.84	1.8	Bolani Township	14.3	10.3
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	Water Authority and Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	
xiii.	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water, if any, required for the project.	<p>Water Drawl agreement for extraction of the 7 cusec (for envisaged level of production) of surface water from Karo River and tributaries has been executed with Executive Engineer, Baitarini Division, Salapada vide agreement no.424 Dt.23.02.2019, with validity of 03 (three) years.</p> <p>Presently the Average consumption is well within the permitted quantity.</p>
xiv.	<p>The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter- alia provide for (i) Standard operating process/ process to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/ conditions, (ii) Hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions and (iii) System of reporting of non- compliances / violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders.</p>	<p>The Policy towards Corporate Environmental Responsibility including details of set up have been submitted to Ministry vide our letter no RMD/BOM/E&amp;L/5.1sqMiles/EC/2013/91 dt 18-03-2013. Necessary steps are being taken for implementation of the same (common for the adjoining 5.10 sq. miles ML of SAIL) regularly.</p> <p>SAIL has always been environmentally conscious and responsible company. Way back in 1996, it was a pioneer in adopting a Corporate Environmental Policy. In view of the rapid technological advancements in the past two decades and growing stringency of regulatory requirements, SAIL has revised its Environmental Policy and made “Corporate Environmental Vision, Policy and Responsibility”, which is under implementation and copy of the same had been attached in EC compliance report for the period of Oct’15 to Mar’16 submitted vide letter no. BOM/ENV/5.1/HD-3600 Dt.30.06.2016</p>
xv.	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. PM <sub>10</sub> ) and NO <sub>x</sub> monitoring. Location of the stations should be decided based on the meteorological data, topographical features and	<p>Four nos. of Ambient Air quality monitoring locations have been fixed in core zone and buffer zone (2 nos. of common for the adjoining 5.10 sq. miles ML of SAIL) , in consultation with State Pollution Control Board , where RSPM (PM<sub>10</sub>) including other parameters are monitored. The monitoring reports are attached as <b>Annexure-I(A)</b>.</p> <p>Action has been taken for installation of 4 (Four) nos) Continuous Ambient Air Quality Monitoring System (CAAQMS) in core and buffer zones of this lease for</p>

Sl. No.	CONDITION	COMPLIANCE
	environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	measurement critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM 10 and NO <sub>x</sub> in the ambient air within the impact zone .
xvi.	Data on Ambient Air Quality [RSPM (PM <sub>10</sub> ) and NO <sub>x</sub> ] should regularly be submitted to the Ministry including its Regional Office, Bhubaneswar and the State Pollution Control Board/ Central Pollution Control Board once in six months.	At present, the data on ambient air quality (RSPM, SO <sub>2</sub> , NO <sub>x</sub> & CO) is regularly submitted on six-monthly basis in the compliance reports of the same ( <b>enclosed as Annexure – I (A)</b> ).  After the installation of CAAQMS system, the data on ambient air quality (PM 10, PM 2.5, SO <sub>2</sub> , NO <sub>x</sub> & CO) will be automatically uploaded to OSPCB server.
xvii.	The top soil, if any, shall temporarily be stored at earmarked site only and should not be kept unutilized for a period more than three years. The topsoil should be used for land reclamation and plantation.	The Mining operations in this ML have not started. However, the top soil generated (after commencement of mining operation) will temporarily be stored at earmarked site and utilized within three years of storing.
xviii.	Measures should be taken for control of noise levels below 85dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provide with ear plugs/ muffs.	The Mining operations in this ML have not been started. However, all workers deployed in the field/loading plant areas are provided with necessary PME kit that includes Ear plugs/muffs.
xix.	Industrial waste water (workshop and waste water from 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.	The Mining operations in this ML have not been started. However, the Same is Noted for Compliance.
xx.	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.	An Environment Management Section (EMS) is established as a separate section under the Mines Department under direct control of Chief General Manager (Mines). The details of constitution is as follows : 1. General Manager (Env & Lease)

Sl. No.	CONDITION	COMPLIANCE
		<p>2. Manager (Env &amp; Lease)</p> <p>3. Mining Mate (Env &amp; Lease)</p> <p>General Manager (Environment &amp; Lease) co-ordinates the day to day activities pertaining to communications related to statutory clearances and compliances of Environment, Forest &amp; Lease Renewal issues and reports to the General Manager (Mining) and Mines Manager who being statutory head regularly reviews the compliances of various Stipulations, Acts and Regulations pertaining to Environmental Matters of Mines and reports to Head of Mines. One (1) Manager (Environment &amp; Lease) is posted in the EMC who expedites initiation of proposals as per Environmental Management Plan and coordinates field implementation of the jobs. A Mining Mate (Environment &amp; Lease) assists him in the day to day activities. Necessary measures are also being taken up for capacity building of the Environment Management Cell by appointment of required qualified personnel as planned in EMP</p> <p>Further, an Environmental Management System (EMS) has been implemented at Bolani Ore Mines which has been certified as per ISO 14001:2015 Standard. The EMS of BOM covers Mining activities, Maintenance activities, Mineral Beneficiation and all other allied activities. As per the EMS, a senior executive of the organization in the level of GM(Mech.), I/c CMC &amp; CBRS functions as Management Representative and is responsible for strict implementation.</p>
xxi.	<p><b>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.</b></p>	<p>The fund earmarked for environmental protection measures is kept in separate account and is not diverted for other purpose. An amount of Rs.108.36 lakhs is spent for environment &amp; forest protection measures during the year 2019-20 against an allocated budget of Rs.150.00 lakhs.</p>
xxii.	<p><b>Project authorities should inform to the Regional Office, Bhubaneswar regarding date of financial closures and final approval of the project by concerned authorities and date of start of land development work.</b></p>	<p>Bolani Ores Mines will inform Regional Office, Bhubaneswar regarding date of financial closures and final approval of the project by concerned authorities and date of start of land development work as soon as the mining commences.</p>
xxiii.	<p><b>Regional office of this Ministry located at Bhubaneswar shall monitor compliance of stipulated</b></p>	<p>BOM has and always will extend wholehearted co-operation to the inspecting authorities by furnishing requisite date/ information/ monitoring reports and</p>

Sl. No.	CONDITION	COMPLIANCE
	conditions. The project authorities should extend full co-operation to the officer(s) of the Regional Office by furnishing requisite date/ information/ monitoring reports.	minutely examining the scope of further actions for improvement.
xxiv.	The project proponent shall submit six monthly report on the status of the 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 Environmental and Forests, its Regional Office, Bhubaneswar, the respective Zonal office of Central Pollution Control Board and State Pollution Control Board. The proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forest, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.	Six monthly compliance reports on the status of implementation of environmental safeguards are being submitted to MoEF&CC, New Delhi, Regional Office – MoEF&CC, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board. Copy of the compliance report inclusive of Environmental Parameters Monitoring data is being uploaded to the SAIL web site i.e. <a href="http://www.sail.co.in">www.sail.co.in</a>
xxv.	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestion/ representation has been received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent, The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Center and Collector's office/ Tehsildar's office for 30 days.	Copies of clearance letter were given to concerned local bodies, from whom suggestion/representation has been received while processing the proposal.

Sl. No.	CONDITION	COMPLIANCE
xxvi.	The 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.	Noted for Compliance.
xxvii.	The environmental statement for each financial year ending 31st march in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of the compliance of environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.	Environment Statement for 2018-19 of Bolani Ores Mines is submitted vide our letter no. BOM/ENV/STMT/HD-1804 Dt.18.04.2019. The environment statement is uploaded on the website of the SAIL along with the status of the compliance of environmental clearance conditions and is also sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.
xxviii.	The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and 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 Boards and also at web site of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of the this Ministry located Bhubaneswar.	Advertisements regarding grant of environmental clearance was published in Odiya daily SAMBADA, Bhubaneswar & Sambalpur Edition on date 27-12-2012 and Business Standard on date 27-12-2012.

Sl. No.	CONDITION	COMPLIANCE
8.	The Ministry or any other competent authority may alter /modify the above conditions or stipulate any further condition in the interest of environment protection.	Agreed to.  The conditions will be complied as and when stipulated.
9.	Failure to comply with any of the condition mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted.
10.	The above condition will be enforced inter-alia, under the provisions of the Water (prevention & Control of Pollution) Act, 1974, the Air (prevention and control of pollution) Act, 1981, the Environment (protection) Act, 1986 and public liability Insurance Act, 1991 along with their amendments and rules made there under.	Noted.
11.	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	Noted.

## ANNEXURE - I(A)

## SAIL RMD

🕒 From: 00:00, 01-Apr-2019

🕒 Upto: 00:00, 01-Oct-2019

## CISF Colony

Parameter	Average	Average Min	Average Max	Min	Max
PM <sub>2.5</sub> (µg / m3)	22.6	6.17 (00:00, 03 May to 00:00, 04 May 2019)	95.39 (00:00, 20 Jun to 00:00, 21 Jun 2019)	3.24 (07:53, 04 May 2019)	1682 (09:15, 21 Jun 2019)
PM <sub>10</sub> (µg / m3)	52.88	15.57 (00:00, 03 May to 00:00, 04 May 2019)	158.77 (00:00, 20 Jun to 00:00, 21 Jun 2019)	10.36 (05:55, 20 Apr 2019)	476.2 (12:14, 20 Jun 2019)

## AAQMS 2 - Campus Store

Parameter	Average	Average Min	Average Max	Min	Max
PM <sub>2.5</sub> (µg / m3)	11.31	5.12 (00:00, 10 Sep to 00:00, 11 Sep 2019)	170.33 (00:00, 05 Sep to 00:00, 06 Sep 2019)	5.12 (11:47, 26 Jun 2019)	253.2 (14:47, 15 Sep 2019)
PM <sub>10</sub> (µg / m3)	45.25	5.12 (00:00, 09 Sep to 00:00, 10 Sep 2019)	103.67 (00:00, 17 Apr to 00:00, 18 Apr 2019)	7.74 (10:09, 26 Jun 2019)	165.4 (09:32, 17 Apr 2019)
NO(µg / m3)	3.47	1.6 (00:00, 15 Apr to 00:00, 16 Apr 2019)	125.56 (00:00, 09 Apr to 00:00, 10 Apr 2019)	0.01 (08:20, 11 May 2019)	3524 (17:47, 04 May 2019)
NO <sub>2</sub> (µg / m3)	21.69	0.01 (00:00, 23 Aug to 00:00, 24 Aug 2019)	100.76 (00:00, 09 Apr to 00:00, 10 Apr 2019)	0.03 (14:51, 10 Jun 2019)	1073 (19:24, 09 Apr 2019)



Parameter	Average	Average Min	Average Max	Min	Max
NO <sub>x</sub> (µg / m3)	22.43	0.32 (00:00, 05 Sep to 00:00, 06 Sep 2019)	106.24 (00:00, 09 Apr to 00:00, 10 Apr 2019)	0.07 (12:00, 31 Jul 2019)	1973 (17:47, 04 May 2019)

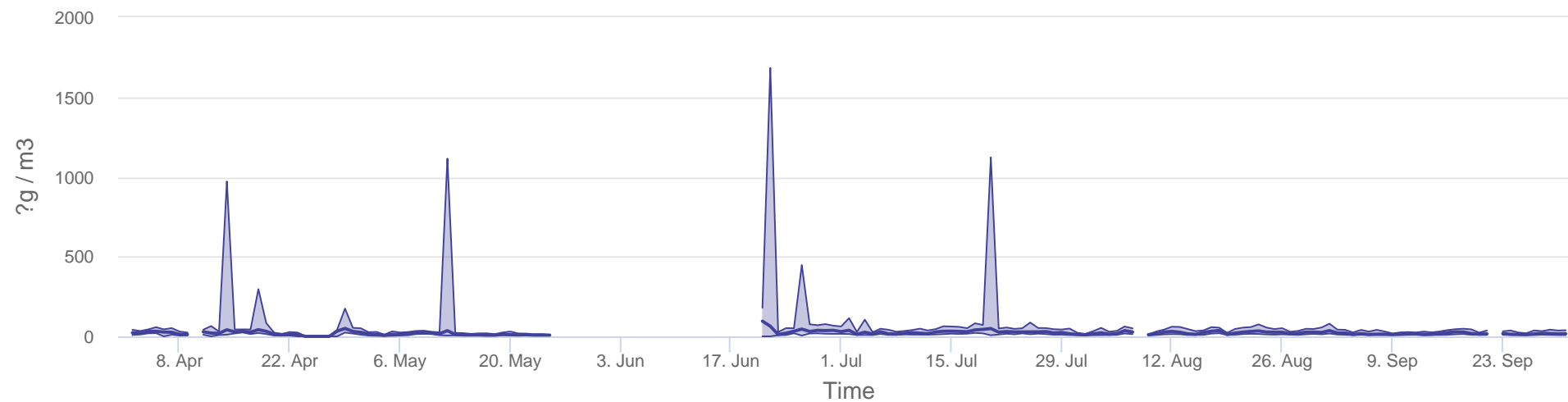
## JNRC

Parameter	Average	Average Min	Average Max	Min	Max
PM <sub>2.5</sub> (µg / m3)	24.57	0.81 (00:00, 17 Jun to 00:00, 18 Jun 2019)	915.13 (00:00, 24 May to 00:00, 25 May 2019)	0.12 (07:29, 18 Apr 2019)	7953 (13:08, 24 May 2019)
PM <sub>10</sub> (µg / m3)	32.92	0.47 (00:00, 03 Aug to 00:00, 04 Aug 2019)	129.81 (00:00, 23 Sep to 00:00, 24 Sep 2019)	0.04 (11:59, 04 Aug 2019)	2751 (06:18, 23 Sep 2019)

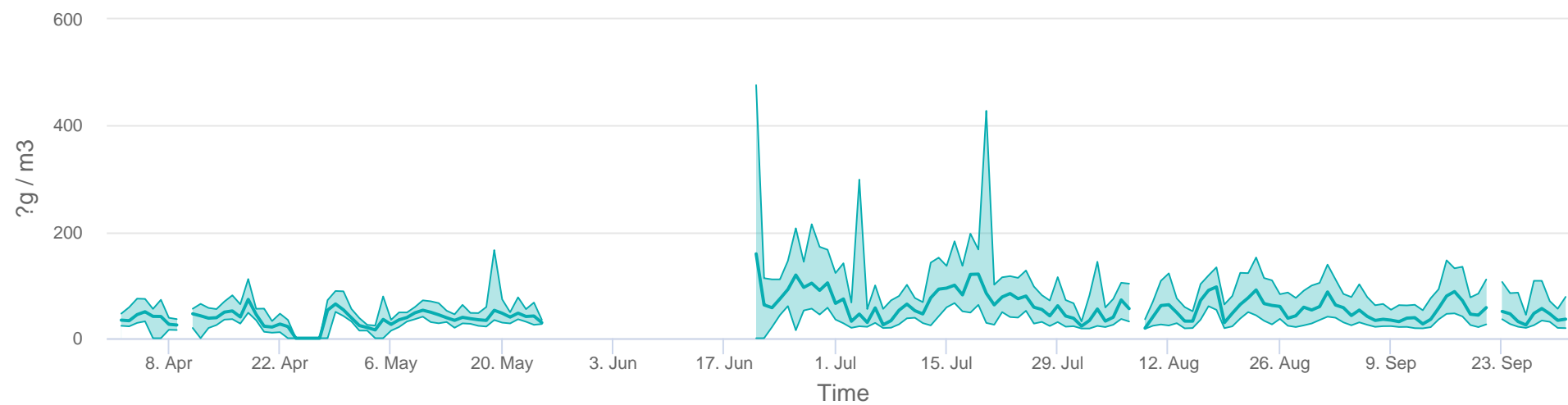
## Near Karo Bridge

Parameter	Average	Average Min	Average Max	Min	Max
PM <sub>2.5</sub> (µg / m3)	85.56	0.71 (00:00, 07 Jul to 00:00, 08 Jul 2019)	3161.02 (00:00, 13 Aug to 00:00, 14 Aug 2019)	0 (08:37, 23 Aug 2019)	3460 (01:37, 13 Aug 2019)
PM <sub>10</sub> (µg / m3)	87.92	16.32 (00:00, 06 Sep to 00:00, 07 Sep 2019)	363.23 (00:00, 08 Aug to 00:00, 09 Aug 2019)	2.73 (23:03, 11 Jun 2019)	3460 (18:24, 13 Aug 2019)

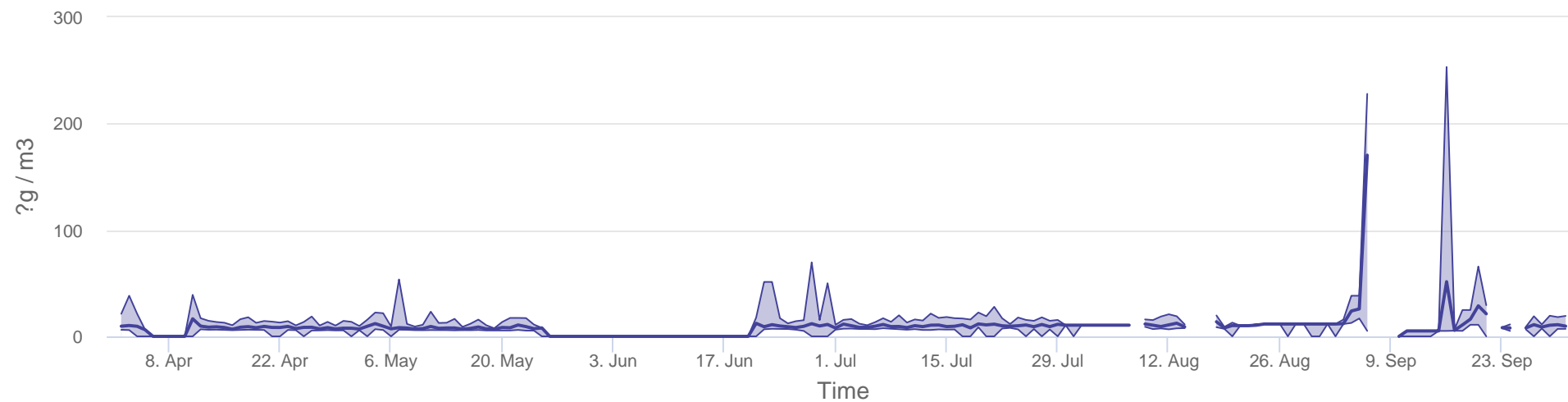
PM2.5 of CISF Colony



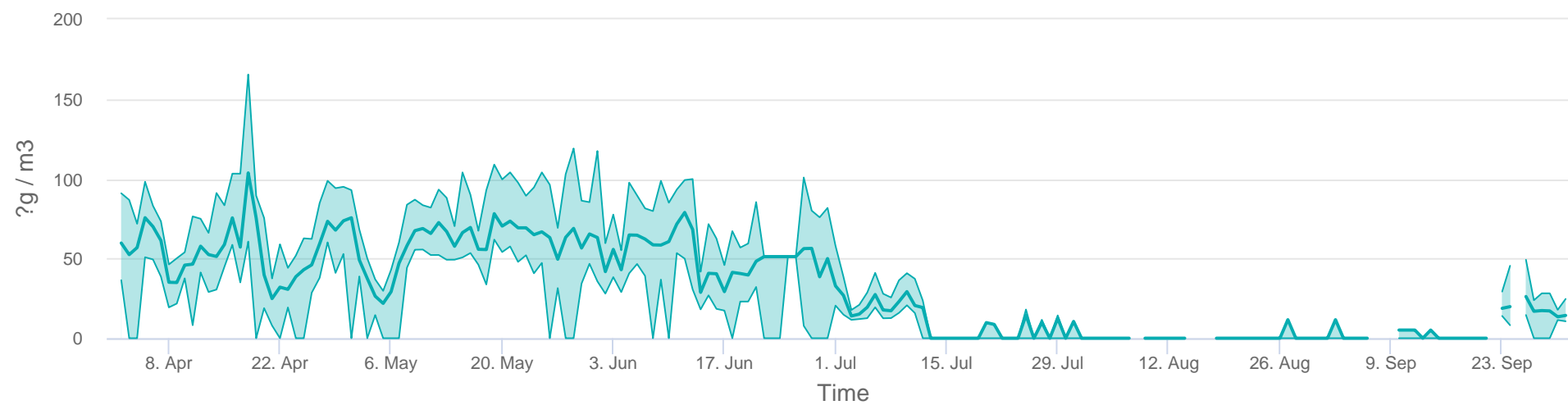
PM10 of CISF Colony

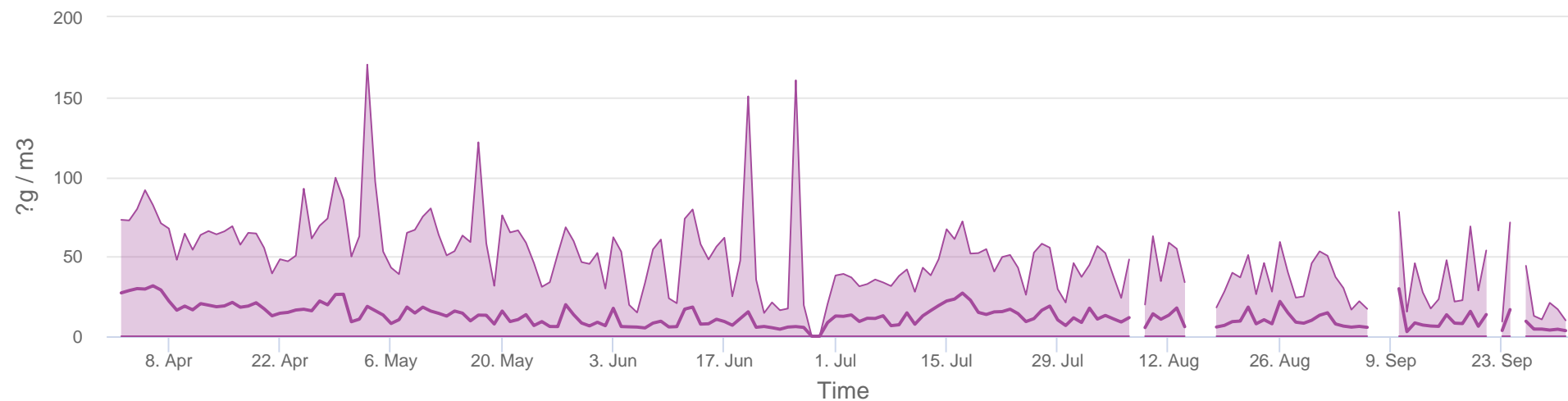


PM2.5 of AAQMS 2 - Campus Store

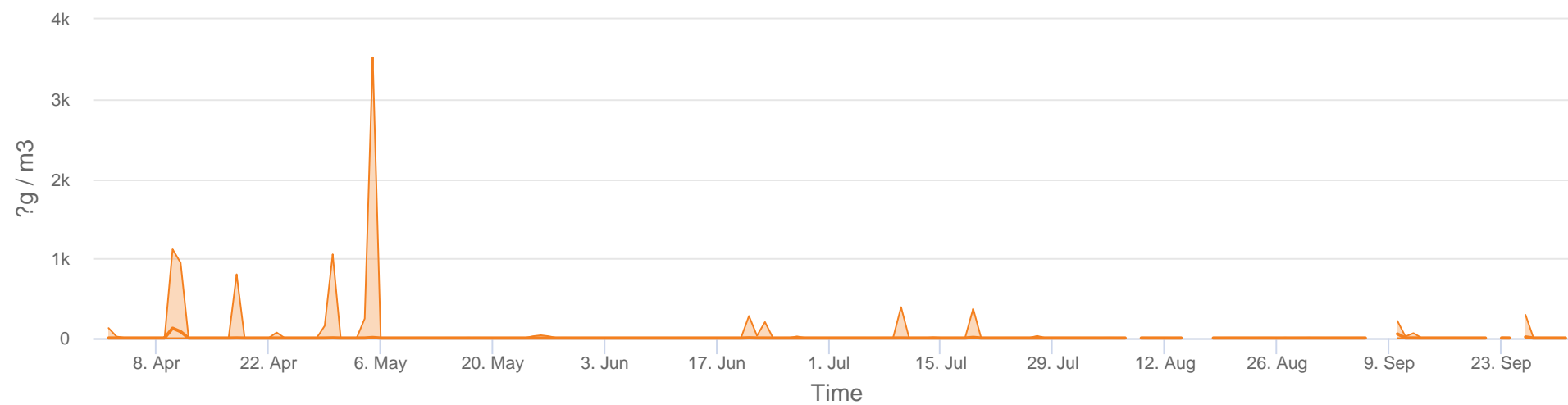


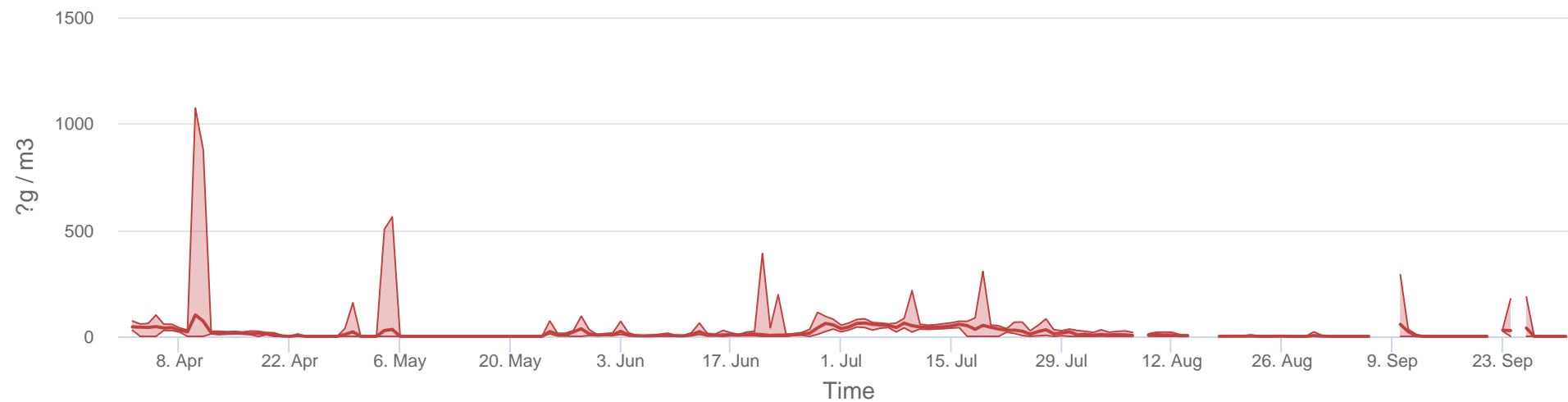
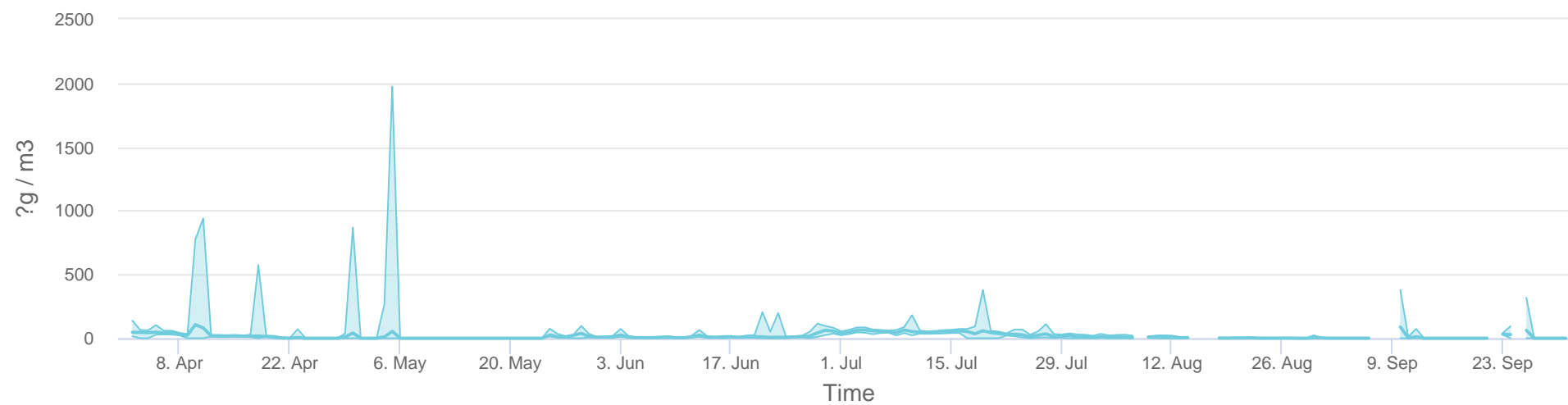
PM10 of AAQMS 2 - Campus Store



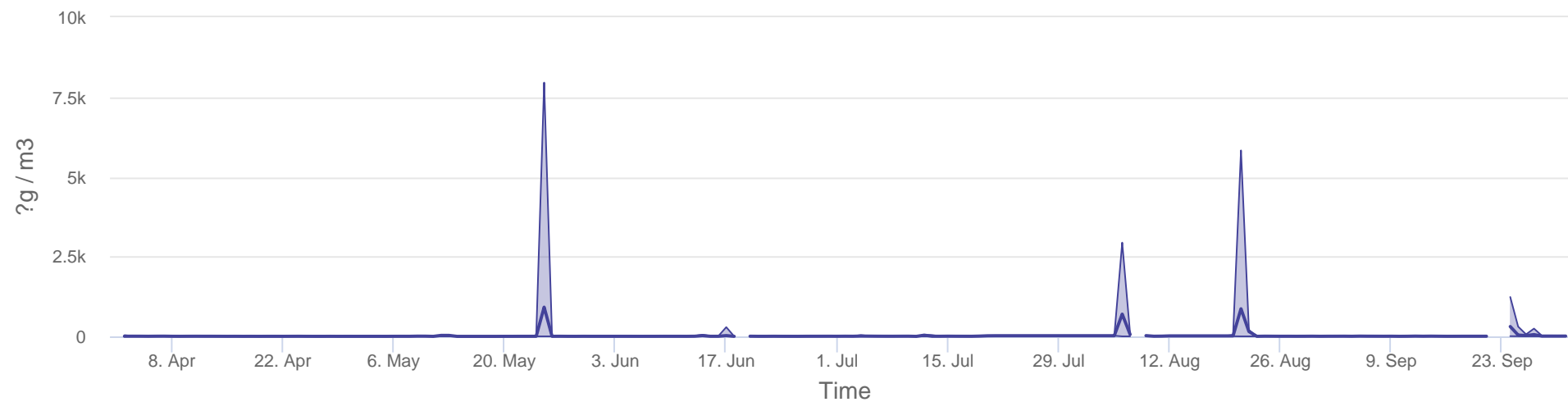
SO<sub>2</sub> of AAQMS 2 - Campus Store

NO of AAQMS 2 - Campus Store

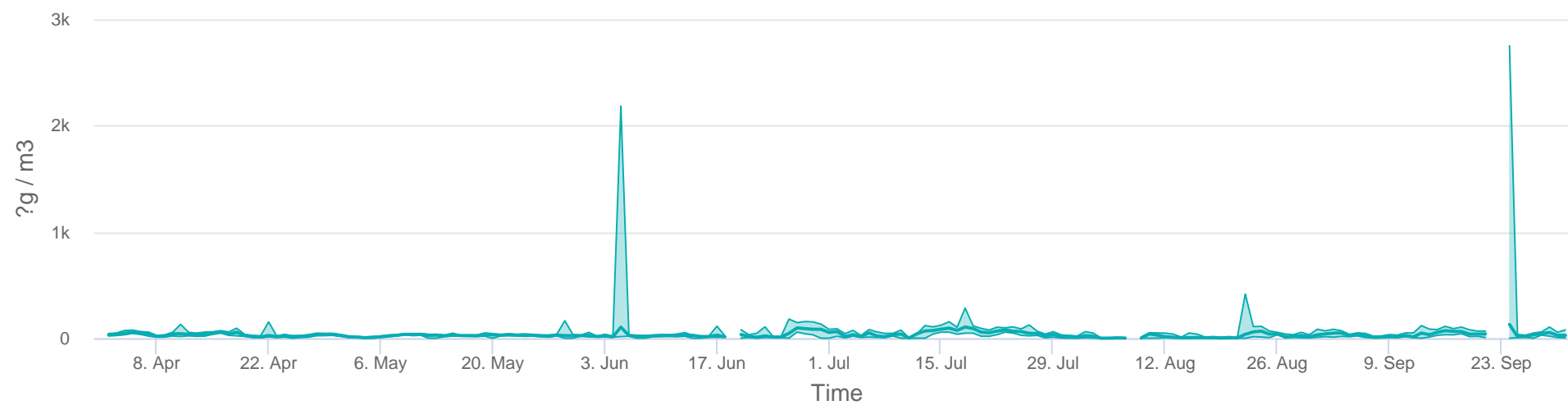


NO<sub>2</sub> of AAQMS 2 - Campus StoreNO<sub>x</sub> of AAQMS 2 - Campus Store

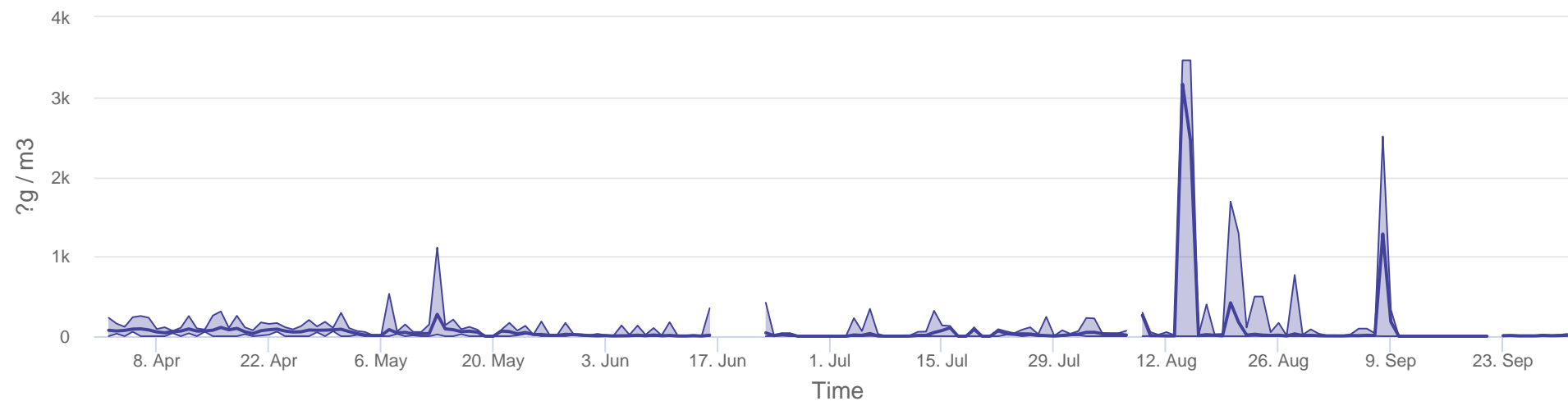
PM2.5 of JNRC



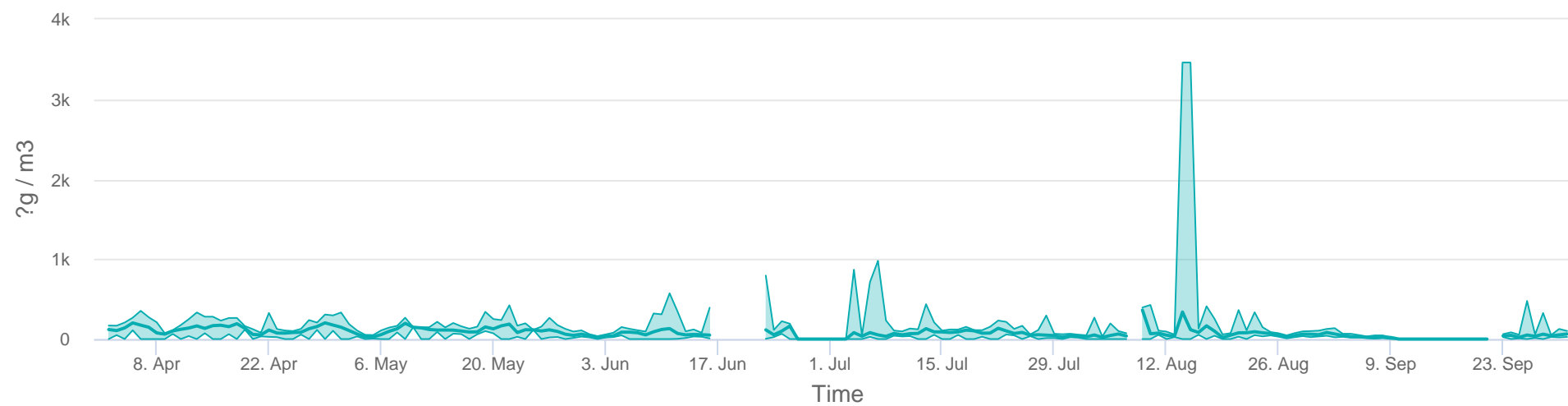
PM10 of JNRC



PM2.5 of Near Karo Bridge

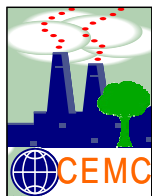


PM10 of Near Karo Bridge



## ANNEXURE - I(B)





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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/BOM/040619/W1

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Karoriver before entering 6.90 ML Lease  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W1

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.68
2	Total Suspended Solids	mg/l	APHA 2540 D	5.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	3.8
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	12.4
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.14
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.19
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.34
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.9

NB: ND- Not Detectable

  
Authorized Signatory

  
Seal of Laboratory

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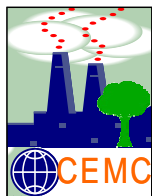
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E-mail- ccmc\_consultancy@yahoo.co.in, ccmc122@gmail.com, website: www.ccmc.in, Landline: 0674-2360344.

Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,

E-mail: ccmclab@yahoo.in, Mobile: 9937631956, 8895177314



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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/BOM/040619/W2

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

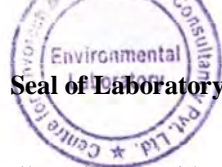
Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Jhikaria Nallah Existing 6.90 ML and before joining Karo  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W2

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.04
2	Total Suspended Solids	mg/l	APHA 2540 D	7.8
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	4.4
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	14.5
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.16
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.25
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.52
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	3.6

NB: ND- Not Detectable

Authorized Signatory



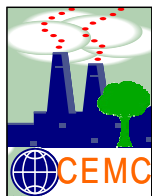
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Report no. - CEMC/BOM/040619/W3

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Jhikaria Nallah at School Pond existing 5.1 ML  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W3

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.31
2	Total Suspended Solids	mg/l	APHA 2540 D	62.0
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	3.2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	11.2
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.15
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.24
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.4
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.5

NB: ND- Not Detectable

  
Authorized Signatory

  
Seal of Laboratory

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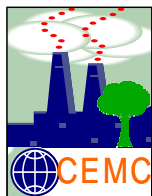
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Report no. - CEMC/BOM/040619/W4

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Karoriver Near Kalimandir  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W4

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.42
2	Total Suspended Solids	mg/l	APHA 2540 D	15.8
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	6.8
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	26.0
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.24
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.2
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.68
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	4.1

NB: ND- Not Detectable

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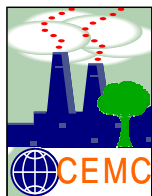
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Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)  
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/BOM/040619/W5

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Panposh nallah within 5.10 ML  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W5

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.41
2	Total Suspended Solids	mg/l	APHA 2540 D	<5.0
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	3.4
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	12.4
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.19
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.16
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.29
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	3.9

NB: ND- Not Detectable

  
Authorized Signatory

  
Seal of Laboratory

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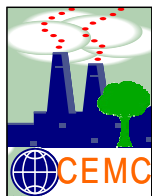
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Report no. - CEMC/BOM/040619/W6

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Limtur Nallah existing 6.90 ML before joining Karo  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W6

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.68
2	Total Suspended Solids	mg/l	APHA 2540 D	24.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl, B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	3.6
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	10.6
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.2
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.22
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.34
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	4.4

NB: ND- Not Detectable

Authorized Signatory

Seal of Laboratory

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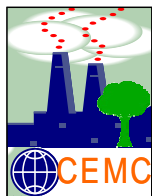
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Report no. - CEMC/BOM/040619/W7

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Surface Water  
Sample Location : Karoriver existing from 6.90 ML Lease (after Limtur)  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W7

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.24
2	Total Suspended Solids	mg/l	APHA 2540 D	<5.0
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl, B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	3.2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	10.2
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.16
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.25
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.36
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	3.7

NB: ND- Not Detectable

Authorized Signatory

Seal of Laboratory

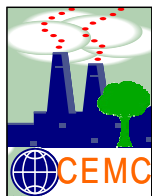
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Report no. - CEMC/BOM/040619/W8

Issued Date-04.06.2019


## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Ground Water  
Sample Location : Well Water of Bolani Village  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W8

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.18
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<5
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.28
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.26
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.42
22	GW Level	mt.		4.1

NB: ND- Not Detectable

  
Authorized Signatory

  
Seal of Laboratory

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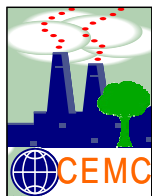
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Report no. - CEMC/BOM/060219/W9

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Ground Water  
Sample Location : Well Water of Balagoda Village  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W9

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.0
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl, B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<5
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.27
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.3
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.6
22	GW Level	mt.		6.84

NB: ND- Not Detectable

Authorized Signatory



Seal of Laboratory

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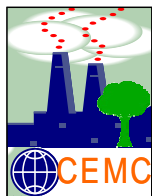
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Report no. - CEMC/BOM/040619/W10

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Location : ETP Outlet in CBRS  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W10

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.74
2	Total Suspended Solids	mg/l	APHA 2540 D	5.4
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	8.8
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.1
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.24
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.3
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.9

NB: ND- Not Detectable

  
Authorized Signatory



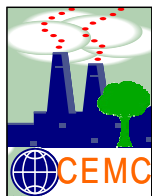
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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/BOM/040619/W11

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Location : Taling pond Seepage Water  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W11

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	7.1
2	Total Suspended Solids	mg/l	APHA 2540 D	6.8
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	2.4
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	10.6
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.12
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.32
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.28
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.5

NB: ND- Not Detectable

  
Authorized Signatory



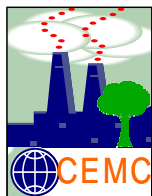
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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no. - CEMC/BOM/040619/W12

Issued Date-04.06.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 16.05.2019  
Sampling by : Mr. Ishwar Bhainsa  
Date of Sample Received : 17.05.2019  
Sample Description : Drinking Water  
Sample Location : Township Supply Water (Mount GH)  
Date of Analysis : 17.05.2019 to 24.05.2019  
Reference No. : CEMC-04062019W12

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.72
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<5
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	<0.05
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.26
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.24

NB: ND- Not Detectable

  
Authorized Signatory



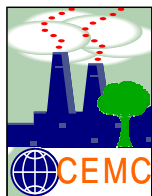
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Report No. - CEMC/BOM/200819/W1

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Surface Water  
Sample Location : Karoriver before entering 6.90 ML Lease  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W1

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.75
2	Total Suspended Solids	mg/l	APHA 2540 D	9.4
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	6.8
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.08
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.08
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.24
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.7

NB: ND- Not Detectable

  
Authorized Signatory

  
Seal of Laboratory

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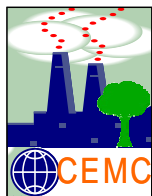
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Report No. - CEMC/BOM/200819/W2

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Surface Water  
Sample Location : Jhikaria Nallah at School Pond existing 5.1 ML  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W2

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.51
2	Total Suspended Solids	mg/l	APHA 2540 D	48.5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	8.2
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.1
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.12
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.28
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.8

NB: ND- Not Detectable

  
Authorized Signatory

  
Seal of Laboratory

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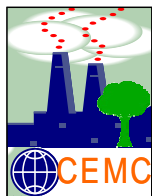
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Report No. - CEMC/BOM/200819/W3

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Surface Water  
Sample Location : Karoriver Near Kalimandir  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W3

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.66
2	Total Suspended Solids	mg/l	APHA 2540 D	20.4
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	10.8
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.16
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.11
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.29
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.2

NB: ND- Not Detectable

Authorized Signatory

Seal of Laboratory

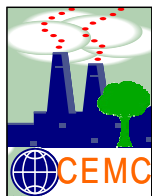
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Report No. - CEMC/BOM/200819/W4

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Surface Water  
Sample Location : Panposh nallah within 5.10 ML  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W4

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.28
2	Total Suspended Solids	mg/l	APHA 2540 D	8.2
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	8.2
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.12
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.09
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.24
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.7

NB: ND- Not Detectable

  
Authorized Signatory

  
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### Notes:

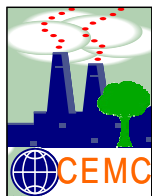
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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report No. - CEMC/BOM/200819/W5

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Surface Water  
Sample Location : Limtur Nallah existing 6.90 ML before joining Karo  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W5

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.21
2	Total Suspended Solids	mg/l	APHA 2540 D	38.4
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl, B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	7.8
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.12
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.12
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.27
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.4

NB: ND- Not Detectable

Authorized Signatory

Seal of Laboratory

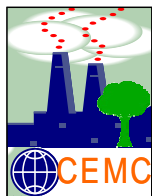
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Report No. - CEMC/BOM/200819/W6

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Surface Water  
Sample Location : Karoriver existing from 6.90 ML Lease (after Limtur)  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W6

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.9
2	Total Suspended Solids	mg/l	APHA 2540 D	10.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl, B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	6.8
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.1
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.11
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.28
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.1

NB: ND- Not Detectable

Authorized Signatory

Seal of Laboratory

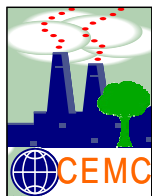
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Report No. - CEMC/BOM/200819/W7

Issued Date-20.08.2019

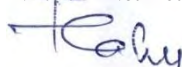
## WATER QUALITY TEST REPORT

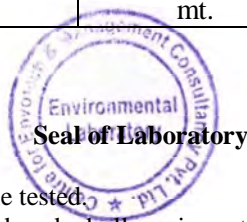
Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Ground Water  
Sample Location : Well Water of Bolani Village  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W7

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	5.82
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<5
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.14
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.18
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.26
22	GW Level	mt.		1.4

NB: ND- Not Detectable

  
Authorized Signatory



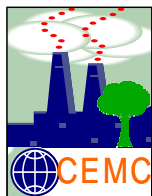
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Report No. - CEMC/BOM/0200819/W8

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Ground Water  
Sample Location : Well Water of Balagoda Village  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W8

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.34
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<5
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.11
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.19
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	1.32
22	GW Level	mt.		1.8

NB: ND- Not Detectable

*Tealy*

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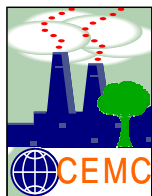
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Report No. - CEMC/BOM/200819/W9

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Description : Drinking Water  
Sample Location : Township Supply Water (Mount GH)  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W9

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.56
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<5
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	<0.05
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.21
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	0.98

NB: ND- Not Detectable

  
Authorized Signatory



### Notes:

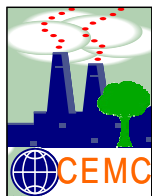
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Report No. - CEMC/BOM/200819/W10

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Location : ETP Outlet in CBRS  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W10

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.2
2	Total Suspended Solids	mg/l	APHA 2540 D	9.2
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	8
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.09
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.18
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.23
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.4

NB: ND- Not Detectable

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Authorized Signatory



Seal of Laboratory

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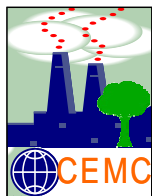
Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

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E-mail- ccmc\_consultancy@yahoo.co.in, ccmc122@gmail.com, website: www.ccmc.in, Landline: 0674-2360344.

Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,

E-mail: ccmclab@yahoo.in, Mobile: 9937631956, 8895177314



# CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

An ISO 9001-2008 & OHSAS 18001:2007 Certified Company, Empanelled with OCCL, ORSAC and SPCB of Govt. of Odisha  
Accredited by NABET, QCI for EIA Studies as 'A' Category Consultant Organization. Empanelled with PCCF(Wildlife) & CWLW, Odisha  
Enlisted in Construction Industry Development Council (CIDC) established by the Planning Commission (Govt. of India)  
MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report No. - CEMC/BOM/200819/W11

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Location : Taling pond Seepage Water  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W11

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.65
2	Total Suspended Solids	mg/l	APHA 2540 D	10.8
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	8.4
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.1
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.22
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.25
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.1

NB: ND- Not Detectable

Authorized Signatory



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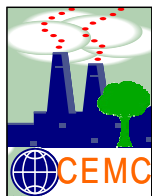
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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report No. - CEMC/BOM/200819/W12

Issued Date-20.08.2019

## WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil  
Date of Sampling : 06.08.2019  
Sampling by : Mr. Santosh Mohanty  
Date of Sample Received : 07.08.2019  
Sample Location : ETP Outlet Bottom Garage  
Date of Analysis : 07.08.2019 to 14.08.2019  
Reference No. : CEMC-20082019W12

## ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H <sup>+</sup> B	6.16
2	Total Suspended Solids	mg/l	APHA 2540 D	12.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl <sub>2</sub> B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2.0
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	7.8
7	Arsenic as As	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr <sup>+6</sup> , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN <sup>-</sup> C,D	ND
16	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	0.12
17	Sulphide as S	mg/l	APHA 4500 S <sup>2-</sup> D	<0.01
18	Phenolic compound as C <sub>6</sub> H <sub>5</sub> OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.24
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.22
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO <sub>3</sub> <sup>-</sup> E	2.6

NB: ND- Not Detectable

Authorized Signatory



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