



By- Email ID

Ref.No.: MGM/P&E/373/20

Date: 01/12/2020

To,
The Additional Director,
Ministry of Environment and Forest & Climate Change,
Eastern Region Office,
A/3, Chandrasekharapur,
Bhubaneswar-751023

Subject: Submission of half-yearly compliance report on the stipulated environmental clearance terms and conditions in respect of Bamebari Iron and Manganese Mine of M/s TATA Steel Ltd., for the period from October'2019 to March'2020.

Reference:

- 1) MoEF Letter Ref No: J-11015/85/2003-IA. II(M) DATED 17th Nov 2005.
- 2) MoEF&CC's notification vide S.O-5845 (E), dt. 28th Nov 2018.

Respected Sir,

We are herewith submitting the six-monthly compliance report on the status of the implementation of the conditions stipulated in environmental clearance awarded to us vide MoEF Letter Ref No: - **J-11015/85/2003-IA. II(M) DATED 17.11.2005** in respect of Bamebari Iron and Manganese Mine of M/s TATA Steel Ltd. for the period from April'2020 to Sep'2020 for your kind perusal.

This is in reference to the MoEF&CC's notification vide S.O-5845, dt. 28th Nov 2018, the six-monthly compliance report is being submitted only in soft copy mode, shared with your good office at e-mail @ roez.bsr-mef@nic.in.

We believe the above submission is in order.

Thanking you,

Yours faithfully,

F: TATA STEEL LTD.


Agent & Head
Manganese Group of Mines
Ferro Alloys Mineral Division
Encl: As above.

Copy To:

- 1) Zonal Office Kolkata, Central Pollution Control Board, South end Conclave, Block 502, 5th and 6th Floors, 1582 Rajdanga Main Road, Kolkata, West Bengal 700107.
- 2) The Member Secretary, State Pollution Control Board, A/118, Nilakantha Nagar, Bhubaneswar, Odisha-751012.
- 3) The Regional Officer, State Pollution Control Board, Baniapat, DD College Road, Keonjhar, Odisha-758001.

TATA STEEL LTD.

Ferro Alloys & Minerals Division, Manganese Group of Mines, At/P.O.: Bichhakundi, Via: Joda,
Dist: Keonjhar Odisha – 758 034 Tel.: 9238101370, e-mail : mnminesadmin@tatasteel.com
Regd.Office : Bombay House, 24 Homi Modi Street, Mumbai – 400 001 Tel 912266658282, Fax 912266657724
Corporate Identity Number L27100MH1907PLC000260 website : www.tatasteel.com



Half-Yearly Compliance Report

On

Environmental Clearance Conditions

(MoEF Letter Ref No: - J-11015/85/2003-IA. II(M) DATED 17.11.2005)

Period: April'2020 – Sep'2020

Submitted By:

Bamebari Iron & Manganese Mine

M/s. Tata Steel Limited

At/Po: Bamebari, Via-Joda

District- Keonjhar, Odisha -758034

Table of Contents

<u>S.No.</u>	<u>Title/Chapter</u>	<u>Page No.</u>
1.	Compliance Status to EC.....	3-13
2.	Annexure-I-Environmental Monitoring (April'20 to Sep'20) -from 14 page onwards	

Compliance to the Environment Clearance Letter No: -11015/85/2003-IA. II(M) DATED 17.11.2005 in respect of Expansion of Bamebari Manganese Mines of M/s Tata Steel Limited for the enhancement of production capacity to a capacity of 0.83LTPA, in villages Bamebari, Boneikala and Joribar, Tehsil Barbil, District-Keonjhar, Odisha

Table. A. Specific Condition:

Sl. No	Specific Condition	Compliance Status (April'20 to Sep'20)
(i)	Mining shall not be undertaken in areas of forestland within the lease without the necessary approvals / forestry clearance.	<p>We have obtained Forest Clearance vide MoEF's letter No 8-72/2004-FC dt 25.01.2007 over an area of 145.329 ha of forest land for Bamebari Iron & Mn. Mines.</p> <p>Further, in the year 2015, MoEF notified the legal status of Sabik Kism of Forest land as on 25.10.1980) as forest land, vide Circular No. F.No.8-78/1996-FC, dated.10.03.2015, due to which applicability of forest clearance over an area of 66.126 ha. of prevailing non-forest land becomes a legal requirement.</p> <p>Accordingly, forest diversion proposal over an area of 303.066 ha (Sabik forest & Balance forest) has been applied on 19.06.2016, the same is under process. Portion of the land (non-forest prior to the circular of 2015) were already broken up as per the prevailing statute.</p> <p>The mining operation and allied activities are confined within the approved diverted area only.</p>
(ii)	Topsoil should be stacked properly with proper slope at earmarked site(s) with adequate measures and should be used for reclamation and rehabilitation of mined out area.	<p style="text-align: center;">Complied.</p> <p>No top soil generated during the period April'20 to Sep'20. Top Soil recovered during mining operation shall be concurrently being used for the development of plantation activities.</p>
(iii)	<p>OB and other wastes should be stacked at earmarked sites only and should not be kept active for long periods of time.</p> <p>Plantation should be taken up for soil stabilization along the slopes of the dump and terraced after every 5-6 m of height and overall slope angle shall be maintained not exceeding 28°. Sedimentation pits shall be constructed at the corners of the garland drains. Retention/toe walls shall be provided at the base of the dumps.</p>	<p style="text-align: center;">Agreed & Complied.</p> <p>OB and other wastes are being dumped as per Scheme of Mining approved by Indian Bureau of Mines. The dump is terraced at every 10m and overall slope is maintained well within 28° as per approved Scheme of Mining.</p> <p>Dump stabilization is carried out by means of Vertiber Plantation followed by plantation of native forestry species saplings.</p> <p>During April'20 to Sep'20, Plantation of around 700 Nos of saplings have been completed. Total plantation for FY 2020-21 is targeted at around 8000Nos. Local forest species such as Gambhari, Neem, Mahaneem, Sisam, Karanj, Sal, etc. shall be planted. The retaining wall and garland drain with sedimentation pit have been provided along the periphery of all the dumps.</p>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No	Specific Condition	Compliance Status (April'20 to Sep'20)
		De-silting of the drains and sedimentation pits are ensured every year before the onset of monsoon.
(iv)	Minerals rejects shall be stacked separately at earmarked site/dump only.	<u>Complied</u> The mineral rejects generated during manual processing of manganese ore (i.e. sorting, dressing and sizing) has been stacked separately at earmarked site.
(v)	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The drains should be regularly desilted and maintained properly. Garland drains (size, gradient & length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall 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. Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall/super cyclone period. A separate storm water sump for this purpose should be created.	<u>Complied.</u> Existing catch drains and garland drains are covering the entire dump slope at low lying part. Size, gradient and length of the drains are adequate to take care of the peak flow. A series of check dams and settling pits have been provided for proper settlement of suspended solid in surface runoff. The garland drain, catch drains and sedimentation pits are periodically de-silted and maintained properly every year before the onset of monsoon.
(vi)	Dimension of retaining wall at the toe of OB dumps and benches within the mine to check run-off and siltation should be based on the rainfall data.	<u>Complied</u> Retaining wall and garland drain with the dimension as specified below, are provided to prevent the siltation and check the run-off. <u>Dimension of the Retaining Wall:</u> Height – 1 to 1.2 mtr. Width – 1 mtr. <u>Dimension of the Garland Drain:</u> Depth – 1.20 to 1.5 mtr. Width – 1 to 1.2 mtr. This status is similar to the status as submitted during Oct'19 to March'20, In the current monsoon only maintenance of the existing structures has been ensured.
(vii)	Trace Metals such as Ni, Co, As and Hg should be analyzed in dust fall and soil samples for at least one year during summer, monsoon and winter seasons. If concentrations of these metals are found below the standards then with prior approval of MOEF this specific monitoring could be discontinued.	<u>Complied.</u> Environmental Monitoring has been conducted vide M/s Visiontek Consultancy, a Bhubaneswar based agency till June'20.
(viii)	Mineral and OB transportation shall be in trucks/dumpers covered with tarpaulins.	<u>Complied.</u>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No	Specific Condition	Compliance Status (April'20 to Sep'20)
	<p>Vehicular emissions should be kept under control and regularly monitored.</p> <p>Suitable measures should be taken to check fugitive emissions from haulage roads & transfer points, etc.</p>	<p>The trucks are being covered with tarpaulin during dispatch of manganese ore from mine to Ferro Alloys Plant and Railway Siding at Joda.</p> <p>OB is being transported by shovel – dumper combination from mine face to dump yard, and since the movement is restricted within the mining area and frequent in nature thus covering by means of tarpaulins is not practiced and feasible from safety point of view.</p> <p>All the trucks meant for transportation of mineral from mine to our captive plant & Railway Siding at Joda is bearing the "Pollution under Control" certificate.</p> <p>Haul road and other areas having potential for producing air borne dust are sprinkled regularly with help of mobile sprinklers. Beside this fixed sprinkler has also been provided in main haul road in Joribar block of Bamebari Iron and Manganese Mine.</p>
(ix)	<p>A green belt of adequate width should be raised by planting the native species around ML area. Plantation should also be carried out along roads, OB dump sites etc. in consultation with the local DFO / Agriculture Department.</p> <p>The density of the trees should be not less than 2500 plants per ha.</p>	<p style="text-align: center;"><u>Complied</u></p> <p>Plantation is an integral part of the progressive mine closure plan approved by Indian Bureau of Mines. Greenbelt development is practiced in line with the Safety Zone norms of the Forest statute.</p> <ul style="list-style-type: none"> We have planted about 700 saplings during the period from April'20 to Sep'20. We have a target of 8000nos of saplings for the FY 2020-21. The plantation shall include the local species forest species like Gambhari, Sal, Neem, Mahaneem, Sisam, Karanj, etc.
(x)	<p>Groundwater shall not be used for mine operations. Prior approval of CGWA shall be obtained for using groundwater.</p>	<p style="text-align: center;"><u>Complied</u></p> <p>NOC from Central Ground Water Authority obtained vide NOC No. CGWA/NOC/MIN/ORIG/2018/3899, dt. 09.08.2018 for the drawl of 130cum/day and not exceeding 47450 cum in a year of ground water was valid till 22nd July 2020. Renewal of NOC has been applied within the due date. Site Inspection by the nodal officer has been completed and renewed NOC is awaited.</p>
(xi)	<p>Mining will not intersect groundwater. Prior permission of the MOEF and CGWA shall be taken to mine below water table.</p>	<p style="text-align: center;"><u>Complied</u></p> <p>It was not envisaged that, Mining would intersect the ground water table as the Ground water being at lower level in comparison to prevailing maximum quarry depth, However in Joribar block ground water seepage of very minimal potential was evidenced in the current financial year. During the renewal of NOC, it shall be regularised as per the applicability of ground water seepage.</p>
(xii)	<p>Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells</p>	<p style="text-align: center;"><u>Complied</u></p> <p>Ground water table is much below the existing mine workings because of mining operations are confined</p>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No	Specific Condition	Compliance Status (April'20 to Sep'20)
	and constructing new piezometers. The monitoring should be done for quantity four times a year in pre-monsoon (April / May), monsoon (August). Post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the MoEF & CGWA quarterly.	at hilly topography only. However, ground water level & quality at existing well at nearby villages are being monitored. One Piezometer has been fitted with telemetric system for real-time surveillance of ground water level and the user ID & Password has been shared with CGWA. Environmental monitoring was ensured till June'20.
(xiii)	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers. The monitoring should be done for quantity four times a year in pre-monsoon (April / May), monsoon (August). Post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the MoEF & CGWA quarterly.	<u>Complied</u> Ground water level & quality at existing well at nearby villages are being monitored. For real-time monitoring of ground water level one telemetric system has also been established. User ID and Password for the telemetric system has been shared with CGWA. Environmental monitoring was ensured till June'20.
(xiv)	Trace metals such as Fe, Cr+6, Cu, Se, As, Cd, Hg, Pb, Zn and Mn at specific locations for both surface water downstream and in ground water at lower elevations from mine area, shall be periodically monitored in consultation with the OSPCB and State Ground Water Board. Suitable treatment measures shall be undertaken in case levels are found to be higher than permissible limits.	<u>Complied.</u> Environmental monitoring was ensured till June'20.
(xv)	"Consent to Operate" should be obtained from SPCB before expanding mining activities.	<u>Complied.</u> Consent to operate has been obtained from Odisha State Pollution Control Board vide Consent No. 117 vide letter no. 8917/ IND-I-CON-189 dated 29.08.2019, valid up to 31.03.2021.
(xvi)	A Conservation Plan for conservation of endangered fauna including the Indian Elephant found in and around the mine area shall be prepared and implemented in consultation with identified agencies/institutions and with the State Forest Department. The Plan should be dovetailed with that prepared / under implementation / proposed for the endangered fauna found in the Reserve Forest in the buffer zone of the project site. The costs for the specific activities/tasks should be earmarked in the Conservation Plan and shall not be diverted for any other purpose. Year.wise status of the implementation of the Plan and the expenditure thereon should be	<u>Complied.</u> A regional wild life conservation plan has been prepared by the state forest department for Bonai & Keonjhar divisions. Towards the implementation cost, we have deposited the fund as assessed by the divisional forest officer. Details is as follows: 1. Rs. 45,05,554/- on 14.12.2005 2. Rs. 47,74,446/- on 27.03.2013 3. Rs. 10672000/- on 24.02.2015 Apart from this, we have also deposited an amount of Rs. 4,69,81,000/- on 15.02.2018 for the implementation of site Specific wildlife management plan, prepared by state forest department.

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No	Specific Condition	Compliance Status (April'20 to Sep'20)
	reported to the Ministry of Environment & forests, RO, Bhubaneshwar.	
(xvii)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	<u>Complied.</u> Progressive Mine Closure Plan for the period 2018-19 to 2019-20 has been approved by Indian Bureau of Mines. The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

Table. B General Conditions

Sl. No	General Condition	Compliance Status (Oct'19 to March'20)
i.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	<u>Complied.</u> No change in mining technology and scope of working has been made at the mine. If any changes proposed in technology and scope of workings, prior approval shall be sought from Ministry of Environment & Forests.
ii.	No change in the calendar plan including excavation, quantum of manganese ore and waste should be made.	<u>Complied.</u> Calendar plan as approved in the mining scheme by Indian Bureau of Mines is complied.
iii.	Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM. SPM, SO ₂ , NO _x . monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Data on ambient air quality (RPM, SPM, SO ₂ & NO _x .) should be regularly submitted to the Ministry including its Regional office at Bhubaneshwar and the State Pollution Control Board / Central Pollution Control Board once in six. Months.	<u>Complied.</u> Environmental monitoring was ensured till June'20.
iv.	Drills should be wet operated or with dust extractors and controlled blasting should be practiced.	<u>Complied.</u> Wet drilling is followed. Controlled blasting technique with NONEL is in practice. Ground vibration for the Peak Particle Velocity is also monitored for major blasts.

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

<p>v.</p>	<p>Fugitive dust emissions from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangements on haul roads, wagon loading, dumpers/ trucks, loading & unloading points should be provided and properly maintained.</p>	<p style="text-align: center;"><u>Complied.</u></p> <p>Effective water sprinkling by mobile water tanker is carried out for haul roads. Fixed sprinkler based dust suppression system is also in place for Joribar block.</p> <p>Environmental monitoring was ensured till June'20.</p>
<p>vi.</p>	<p>Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM should be provided with ear plugs/ muffs.</p>	<p style="text-align: center;"><u>Complied.</u></p> <p>Ear plugs & Ear muffs are provided to the workers working in drilling operations & DG operations.</p> <p>Environmental monitoring was ensured till June'20.</p>
<p>vii.</p>	<p>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.</p>	<p style="text-align: center;"><u>Complied.</u></p> <p>Oil-Water separation system has been provided at workshop and working effectively. Samples both before treatment and after treatment are collected and analysed on monthly basis.</p> <p>Environmental monitoring was ensured till June'20</p>
<p>viii.</p>	<p>Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.</p>	<p style="text-align: center;"><u>Complied.</u></p> <p>To ensure an independent environmental monitoring, sampling, analysis and reporting of the environmental quality parameters was outsourced to a third-party M/s Visiontek Consultancy, a Bhubaneswar based agency having MoEF&CC authorization for the period till June'20.</p>
<p>ix.</p>	<p>Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.</p>	<p style="text-align: center;"><u>Complied.</u></p> <p>Use of dust masks is mandatorily followed for all the workers engaged in dusty areas. Employees are undergoing Periodical Medical Examination such as lungs related tests and audiometry. Significant emphasis is also provided on the safety and awareness of the personnel and ensured by means of daily safety talk, pre-start talk, implementation of Safe Operating Procedure, assessment of Hazards and safety visit cum line walk based initiatives.</p> <p>The initial and periodical examination includes blood hematology, blood pressure, detailed cardiovascular assessment, neurological examination etc.</p>
<p>x.</p>	<p>A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly</p>	<p style="text-align: center;"><u>Complied</u></p> <p>A central environmental management cell has been established, wherein an environmental manager ensures the implementation of environmental</p>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

	to the Head of the Organization.	management plan at the mining sites and reports to the Head of the Chief Environment via Head, Environment Management who in turn reports to the Head of the Organisation.
xi.	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.	<u>Complied</u> Funds allocated for environmental management are earmarked in separate cost center maintained for the purpose.
xii.	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/information/monitoring reports	<u>Complied.</u> We are extending full co-operation to the officers of the Regional Office by furnishing the requisite data / information / monitoring reports.
xiii.	A copy of clearance letter will be marked to the concerned Panchayat/local NGO, if any, from whom suggestion/representation has been received while processing the proposal.	<u>Complied.</u> Copy of the clearance letter marked to Sarpanch, Gram Panchayat, Palasa on 12.01.2006.
xiv.	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.	Applicable for the State Pollution Control Board, Odisha.
xv.	The project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular of the locality concerned within seven 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 may also be seen at Web Site of the Ministry of Environment & Forests at http://envfor.nic.in . and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.	<u>Complied.</u> A copy of Environmental Clearance has been advertised in two local newspapers such as Anupam Bharat & Aam Khabar , dt.10.01.2006.

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

xvi.	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Noted.
xvii.	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance.	Noted
xviii.	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, 1991 along with their amendments and rules.	Noted

A. Additional Conditions as per MoEFCC Letter No. 106-9/11/EPE dt. 02.12.2014 issued to all

Non-Coal Mining Projects.

Sl. No.	Stipulated Condition	Compliance Status (April'20 to Sep'20)
i.	The project authority shall adopt best mining practices for given conditions in the mining area, adequate number of check dam, retaining wall/ structure, garland drains and settling ponds should be provided to arrest the wash off with rain water in catchment area.	<p><u>Complied & Ongoing.</u></p> <p>The mine is operated by opencast mining method using shovel-dumper combination. Due care is taken during all the aspects of mining operations (starting from excavation till dispatch of the minerals) to ensure sustainable practices are adopted such as:</p> <ol style="list-style-type: none"> 1. Wet drilling (Drills with inbuilt features of wet drilling) for preventing fugitive dust generation at the working face. 2. Controlled blasting by means of pre-split blasts using both NONEL & SME for arresting fly rocks and improved fragmentation with minimal ground vibration is practiced. 3. Pre-wetting is also carried out prior to blasting to minimize dust generating potential of blasts. 4. Stationary water sprinklers and mobile water tankers are operated main/permanent haul roads. 5. Garland drains all along the periphery of dumps supported with toe walls/gabion walls and 10nos of settling pits (1.5mX1.5mX2m) for guiding effluents/surface runoff up to ETP.
ii.	The natural water bodies and or stream which are flowing in and 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 authority has to provide	<p><u>Complied.</u></p> <p>Agreed. No water bodies disturbed due to mining activities. Drinking water is provided to the villagers.</p>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No.	Stipulated Condition	Compliance Status (April'20 to Sep'20)
	water to the villagers for their use. A provision for regular monitoring of water table in open dug well	
iii.	The illumination and sound at night at project sites disturb the village in respect of both human and animal population. Consequent sleeping disorder and stress may affect the health in the village located close to mining operation. Habitations have a right to darkness and minimal noise level at night. The Project Proponents must ensure that the biological clock of the village is not disturbed by orienting the floodlights mask way from the village and keeping the noise levels well within prescribed limits for day/ night hours.	<p style="text-align: center;"><u>Complied.</u></p> <p>The operation of the mine is restricted to the day hours only. Hence, there is no disturbance to the habitats located close to the mining operation. The biological clock of the village is not disturbed.</p>
iv.	The project Authority shall make necessary alternative arrangement, where required, in consultation with state Government to provided alternated areas for livestock grazing. In this case context, the Project Authority should implement the direction of Hon'ble Supreme Court with regard to acquiring grazing land. The sparse tress on such grazing ground, which provides mid-day shelter from the scorching sun, should be scrupulously guarded felling lest the cattle abandon the grazing ground or return home by noon.	<p style="text-align: center;"><u>Not Applicable.</u></p> <p>No such grazing land have been acquired by the company.</p>
v.	Where ever blasting is undertaken as part of mining activity, the Project Authority shall carry out vibration studies well before approaching any such habitats or other building to evaluate the zone of influence and impact of blasting on neighbourhood. Within 500 meters of such sites vulnerable to blasting vibration, avoidance of use of explosives and adoption of alternative means of mineral extraction such as ripper/dozer combination/ rock breakers/ surface mineral etc should be seriously considered and practiced wherever practicable. A provision for monitoring of each blast should be made so that impact of blasting on nearby habitation and dwelling unit could be ascertained. The covenant of lease deed under rule 31 of MCR 1960 provided that no mining operation shall be carried out within 50 meters of public works such as public roads and	<p style="text-align: center;"><u>Complied.</u></p> <p>Deep hole drilling and controlled blasting technique is adopted in the mine. Vibration study has been conducted by CIMFR. Each blast is monitored for the Peak Particle Velocity which is well within the DGMS prescribed limits.</p> <p>Rock breakers are used to avoid secondary blasting.</p>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No.	Stipulated Condition	Compliance Status (April'20 to Sep'20)
	building or inhabited sites except with prior permission from the competent Authority.	
vi.	Main haulage road in the mines should be provided with permanent water sprinkler and other road should be regularly wetted water tanker fitted with sprinkler. Crusher and material transfer points should be invariably be provided with bag filter and or dry fogging system. Belt conveyor fully covered to avoid air borne dust.	<p align="center"><u>Complied.</u></p> <p>Mobile water based dust suppression is regularly carried out over the main haul road, mineral stacking area overburden dumping areas and permanent portions are operated with fixed sprinklers.</p>
vii.	The project Authority shall ensure that productivity of agriculture crops is not affected due to the mining operation. Crop Liability Insurance Policy has to be taken by PP as a precaution to compensate for the crop loss. The impact zone shall be 5 Km from the boundary of mine lease area for insurance policy. In case, several mines are located in cluster mines, formed inter - alia, to sub serve such and objective shall be responsibility for securing such Crop Liability Policy.	<p align="center"><u>Not Applicable.</u></p> <p>There is no crop land nearby the M.L. area.</p>
viii.	In case any village is located within the mining leasehold which is not likely to be affected due to mining activities during the life of mine, the Expert Appraisal Committee (EAC) should consider the proposal of Environmental Clearance (EC) for reduced mining area. The mining lease may be executed for the area for which EC is accorded. The mining plan also accordingly revised and required stipulation under the MMDR Act 1957 and MCR 1969 met.	<p align="center"><u>Not Applicable.</u></p>
ix.	<p>Transportation of minerals by road passing through the village shall not be allowed.</p> <p>A "bypass" road should be constructed (say leaving a gap of at least 200 m) for the purpose of transportation of minerals so that the impact of sound, dust and accidents could be mitigated.</p> <p>The PP shall bear the cost towards the widening and strengthening of existing public road</p>	<p align="center"><u>Complied.</u></p> <p>There is no transportation road passing through any village.</p>

Six Monthly EC Compliance Report-Bamebari Iron & Manganese Mine, M/s Tata Steel Limited for Apr'20 – Sep'20

Sl. No.	Stipulated Condition	Compliance Status (April'20 to Sep'20)
	<p>network in case same is proposed to be used for the project. No road movement should be allowed on existing village road No road movement should be allowed on existing village road without appropriately increasing carrying capacity of such road</p>	
x.	<p>Likewise, alteration or re-routing of foot paths, pagdandies, cart road and village infrastructure/ public utilities or roads (for purpose of land acquisition for mining) shall be avoided to extent possible and in such case acquisition is inevitable, alternative arrangements shall be made first and the only the area can be acquired. In these types of cases Inspection reports by site visit by expert may be insisted upon which should be done through reputed Institutes.</p>	<p><u>Not Applicable.</u> Entire lease area of 406.0ha is govt. land (404.669ha of forest land and 1.331ha of non-forest land thus this project was not subjected to land acquisition.</p>
xi.	<p>The CSR activates by companies including mining establishment has become mandatory up to 2% their financial turn over, socio Economic Development of neighbourhood. Habitats could also be planned and executed by the PPs more systemically based on need based door to door survey by established Social Institute/ Workers on the lines as required under TOR. “ R&R Plan// compensation details for Project Affected People (PAP) should be furnished. While preparing the R&R plant, the relevant State/ national Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs and STs and weaker section of society in study, a need bashed sample survey, family-wise, should be undertaken to assess their requirement, and action programmes prepared and submitted accordingly, integrating the sectoral programs of line department of State Government. It may be clearly brought out whether the village including their R&R and socio-economics aspect should be discussed in EIA report.</p>	<p><u>Complied.</u> Tata Steel has taken up many social initiatives for the improvement of quality of life of the surrounding community by means of education, health and other socio-economic aspects. TSRDS (Tata Steel Rural Development Society) has been pioneering the initiatives through CSR activities. R&R policy is not applicable for the PP till now.</p>

Agent & Head,
Manganese Group of Mines
 Ferro Alloys Mineral Division
 (Bamebari Iron and Mn.Mine)
 M/s Tata Steel Lim

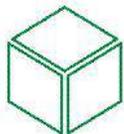
Date:

Sl. No.	Stipulated Condition	Compliance Status (April'20 to Sep'20)
	network in case same is proposed to be used for the project. No road movement should be allowed on existing village road network without appropriately increasing carrying capacity of such road	
x.	Likewise, alteration or re-routing of foot paths, pagdandies, cart road and village infrastructure/ public utilities or roads (for purpose of land acquisition for mining) shall be avoided to extent possible and in such case acquisition is inevitable, alternative arrangements shall be made first and the only the area can be acquired. In these types of cases Inspection reports by site visit by expert may be insisted upon which should be done through reputed Institutes.	<p align="center"><u>Not Applicable.</u></p> <p>Entire lease area of 406.0ha is govt. land (404.669ha of forest land and 1.331ha of non-forest land thus this project was not subjected to land acquisition.</p>
xi.	The CSR activates by companies including mining establishment has become mandatory up to 2% their financial turn over, socio Economic Development of neighbourhood. Habitats could also be planned and executed by the PPs more systemically based on need based door to door survey by established Social Institute/ Workers on the lines as required under TOR. " R&R Plan// compensation details for Project Affected People (PAP) should be furnished. While preparing the R&R plant, the relevant State/ national Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs and STs and weaker section of society in study, a need bashed sample survey, family-wise, should be undertaken to assess their requirement, and action programmes prepared and submitted accordingly, integrating the sectoral programs of line department of State Government. It may be clearly brought out whether the village including their R&R and socio-economics aspect should be discussed in EIA report.	<p align="center"><u>Complied.</u></p> <p>Tata Steel has taken up many social initiatives for the improvement of quality of life of the surrounding community by means of education, health and other socio-economic aspects. TSRDS (Tata Steel Rural Development Society) has been pioneering the initiatives through CSR activities. R&R policy is not applicable for the PP till now.</p>



Agent & Head,
Manganese Group of Mines
 Ferro Alloys Mineral Division
 (Bamebari Iron and Mn.Mine)
 M/s Tata Steel Limited

Date: 01/12/2020



Ref: Envlab/20/078

Date: 03.05.2020

METEOROLOGICAL DATA FOR APRIL-2020

1. Name of The Client : **Bamebari Manganese Mines (M/s TATA Steel Ltd**
2. Location : Mines Office
3. Sample Collected By : VCSPL Representative in presence of TATA Representative

Date	Temperature(⁰ C) (Avg.)	Relative Humidity (%) (Avg.)	Wind Speed m/sec		Wind Direction	Rain fall (mm)
			Min	Max		
01-Apr-20	37.4	26.2	49.3	29.3	3.9	0.6
02-Apr-20	38.2	27.4	56.4	25.1	5.0	0.8
03-Apr-20	39.6	26.3	63.0	26.9	4.7	0.6
04-Apr-20	38.7	25.8	69.4	28.1	3.3	1.4
05-Apr-20	37.2	26.3	53.2	26.4	4.4	0.8
06-Apr-20	38.9	27.5	45.7	22.9	4.7	1.1
07-Apr-20	40.1	25.1	48.3	25.5	2.5	1.1
08-Apr-20	37.4	24.3	62.1	38.0	3.6	0.6
09-Apr-20	37.1	25.4	61.6	35.4	2.8	0.8
10-Apr-20	40.2	25.8	50.6	25.2	4.2	0.6
11-Apr-20	39.6	26.1	59.2	31.0	4.4	1.1
12-Apr-20	40.5	26	60.4	26.3	5.8	0.8
13-Apr-20	42.7	25.2	44.7	21.7	4.7	1.1
14-Apr-20	43.5	24.4	54.3	24.2	3.6	1.1
15-Apr-20	40.9	24.8	65.2	34.0	2.8	1.9
16-Apr-20	39.5	25.1	53.6	30.3	3.3	1.1
17-Apr-20	40.2	23.2	67.8	26.5	4.2	2.2
18-Apr-20	41.1	24.7	80.2	25.9	3.6	1.1
19-Apr-20	39.6	23.6	71.3	36.7	7.5	0.8
20-Apr-20	40.5	24.2	67.3	29.2	3.9	1.1
21-Apr-20	38.7	22.8	64.5	25.3	6.1	1.1
22-Apr-20	35.2	23.1	85.1	37.2	5.0	2.2
23-Apr-20	36.2	22.4	91.2	43.2	5.3	2.2
24-Apr-20	32.3	23.6	81.6	46.1	7.5	2.5
25-Apr-20	35.1	24.3	88.7	44.8	5.3	1.4
26-Apr-20	33.9	16.8	87.3	48.3	3.3	1.7
27-Apr-20	37.4	19.3	82.5	39.6	5.0	0.8
28-Apr-20	33.4	22.2	83.0	42.8	4.2	1.1
29-Apr-20	31.5	24.1	82.6	37.3	4.7	0.6
30-Apr-20	34.2	23.3	78.4	41.4	4.7	1.7

Source: Site Specific Meteorological data & www.worldweatheronline.com

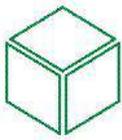
M. Anand
Prepared by



Puja Mohanty

Verified by





Ref: Envlab/20/079

Date: 03.05.2020

AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : **AAQMS-1:Office Building**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Sl. No.	Date of Monitoring	Concentration of Pollutants												
		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	O ₃ (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	Benzo(a) pyrene (ng/m ³)	Mn (µg/m ³)
1	01.04.2020	60.6	36.36	8.8	12.6	7.1	0.44	26.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
2	04.04.2020	61.4	36.84	8.4	12.2	7.6	0.46	26.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
3	08.04.2020	62.8	37.68	9.2	13.4	7.2	0.42	25.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
4	11.04.2020	68.8	41.28	9.4	13.6	7.4	0.38	25.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
5	15.04.2020	70.2	42.12	9.1	14.2	8.1	0.41	24.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
6	18.04.2020	71.8	43.08	8.6	14.1	8.4	0.42	24.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
7	22.04.2020	72.6	43.56	8.2	13.8	8.6	0.44	23.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
8	25.04.2020	74.8	44.88	7.8	15.2	8.2	0.44	23.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
9	29.04.2020	68.4	41.04	8.1	14.4	7.8	0.42	21.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Average		67.93	40.76	8.62	13.72	7.82	0.43	24.64	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality		100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to		IS: 5182(Part -23)-1999	USEPA CFR-40, Part-50, Appendix -L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 : Part.10-1999	Air Sampling , 3 rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22 nd -3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO-3.2

BDL Values: SO₂< 4 µg/m³, NO_x< 9 µg/m³, O₃<4 µg/m³, NH₃<20 µg/m³, Ni<0.01 ng/m³, As < 0.001 ng/m³, C₆H₆<0.001 µg/m³, BaP<0.002 ng/m³, Pb<0.001 µg/m³, CO<0.1 mg/m³, Mn<0.001 µg/m³

Mande
Prepared by



Puja Mohanty
Verified by





Ref: Envlab/20/080

Date: 03.05.2020

AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : **AAQMS-2:Mines Pit**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Sl. No.	Date of Monitoring	Concentration of Pollutants												
		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	O ₃ (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	Benzo(a) pyrene (ng/m ³)	Mn (µg/m ³)
1	01.04.2020	60.8	36.48	14.2	18.6	7.8	0.66	24.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
2	04.04.2020	60.2	36.12	15.2	19.2	8.4	0.64	24.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
3	08.04.2020	59.8	35.88	15.6	19.6	8.6	0.72	25.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
4	11.04.2020	56.8	34.08	12.8	16.9	8.2	0.69	25.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
5	15.04.2020	60.6	36.36	13.2	17.4	7.2	0.52	25.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
6	18.04.2020	59.6	35.76	13.6	17.8	7.6	0.54	26.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
7	22.04.2020	58.8	35.28	12.8	18.8	7.2	0.48	27.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
8	25.04.2020	56.2	33.72	12.4	19.2	7.4	0.44	26.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
9	29.04.2020	55.4	33.24	12.2	19.6	7.1	0.51	26.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Average		58.69	35.21	13.56	18.57	7.72	0.58	25.82	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality		100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to		IS: 5182(Part -23)-1999	USEPA CER-40, Part-50, Appendix -L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 : Part.10-1999	Air Sampling, 3 rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22 nd -3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO-3.2

BDL Values: SO₂< 4 µg/m³, NO_x< 9 µg/m³, O₃<4 µg/m³, NH₃<20 µg/m³, Ni<0.01 ng/m³, As < 0.001 ng/m³, C₆H₆<0.001 µg/m³, BaP<0.002 ng/m³, Pb<0.001 µg/m³, CO<0.1 mg/m³, Mn<0.001 µg/m³

Manda

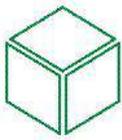
Prepared by



Puja Mohanty

Verified by





Ref: Envlab/20/081

Date: 03.05.2020

AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : **AAQMS-3:Weighing Bridge**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Sl. No.	Date of Monitoring	Concentration of Pollutants												
		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	O ₃ (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	Benzo(a) pyrene (ng/m ³)	Mn (µg/m ³)
1	01.04.2020	62.8	37.68	8.1	16.2	7.4	0.52	24.02	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
2	04.04.2020	66.2	39.72	7.8	16.8	7.2	0.54	24.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
3	08.04.2020	64.8	38.88	7.4	17.2	7.1	0.58	24.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
4	11.04.2020	62.8	37.68	8.2	17.6	7.6	0.62	23.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
5	15.04.2020	63.6	38.16	8.4	15.8	7.2	0.66	22.9	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
6	18.04.2020	61.8	37.08	8.6	14.6	7.3	0.61	23.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
7	22.04.2020	66.2	39.72	9.1	14.8	7.1	0.58	24.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
8	25.04.2020	66.6	39.96	9.4	15.2	7.2	0.6	24.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
9	29.04.2020	64.2	38.52	9.6	16.1	8	0.61	23.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Average		64.33	38.60	8.51	16.03	7.34	0.59	23.95	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality		100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to		IS: 5182(Part -23)-1999	USEPA CFR-40, Part-50, Appendix -L	IS: 5182 (Part- 2)-2001	IS: 5182 (Part- 6)-2006	IS: 5182 (Part- 9)-1974	IS 5182 : Part.10-1999	Air Sampling, 3 rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22 nd -3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO-3.2

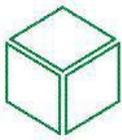
BDL Values: SO₂< 4 µg/m³, NO_x< 9 µg/m³, O₃<4 µg/m³, NH₃<20 µg/m³, Ni<0.01 ng/m³, As < 0.001 ng/m³, C₆H₆<0.001 µg/m³, BaP<0.002 ng/m³, Pb<0.001 µg/m³, CO<0.1 mg/m³, Mn<0.001 µg/m³

M. Anand
Prepared by



Puja Mohanty
Verified by





Ref: Envlab/20/082

Date: 03.05.2020

AAQ MONITORING REPORT FOR APRIL-2020 (BUFFER ZONE)

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sample collected by : VCSPL representative in presence of TATA representative.

Date of Monitoring	Concentration of Pollutants												
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	O ₃ (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	Benzene (µg/m ³)	Benzo(a) pyrene (ng/m ³)	HC (µg/m ³)
24.04.2020 BZ1: Jaganathpur	61.2	36.72	6.6	12.8	11.2	0.74	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
24.04.2020 BZ2: Bandhubaria	68.8	41.28	7.7	12.6	11.8	0.89	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
25.04.2020 BZ3: Raikara	70.6	42.36	7.8	10.8	8.8	0.84	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part -23)-1999	USEPA CFR- 40,Part- 50, Appendix -L	IS: 5182 (Part- 2)-2001	IS: 5182 (Part- 6)- 2006	IS: 5182 (Part- 9)- 1974	IS 5182 : Part.10- 1999	Air Sampling , 3 rd Edn.By James P. Lodge (Method- 401)	EPA IO- 3.2	EPA IO-3.2	APHA 22 nd - 3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	--

BDL Values: SO₂< 4 µg/m³, NO_x< 9 µg/m³, O₃<4 µg/m³, NH₃<20 µg/m³, Ni<0.01 ng/m³, As < 0.001 ng/m³, C₆H₆<0.001 µg/m³, BaP<0.002 ng/m³, Pb<0.001 µg/m³, CO<0.1 mg/m³, HC<0.001 µg/m³

M. Panda

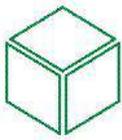
Prepared by



Pooja Mishra

Verified by





Ref: Envlab/20/083

Date: 03.05.2020

DAILY DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **DW-1: Water Treatment Plant**
3. Sample collected by : **VC SPL Representative in presence of TATA Representative**

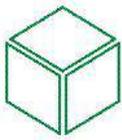
Sl No	Test Parameters	Norms as per IS: 10500-2012		Analysis Results									
		Desirable Limit	Permissible Limit	01-04-20	02-04-20	03-04-20	04-04-20	05-04-20	06-04-20	07-04-20	08-04-20	09-04-20	10-04-20
1	pH value (25°C)	6.5 - 8.5	No Relaxation	7.58	7.52	7.54	7.51	7.52	7.52	7.56	7.58	7.51	7.48
2	Turbidity in NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sl No	Test Parameters	Norms as per IS: 10500-2012											
		Desirable Limit	Desirable Limit	11-04-20	12-04-20	13-04-20	14-04-20	15-04-20	16-04-20	17-04-20	18-04-20	19-04-20	20-04-20
1	pH value (25°C)	6.5 - 8.5	6.5 - 8.5	7.42	7.51	7.52	7.54	7.56	7.60	7.61	7.50	7.49	7.49
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sl No	Test Parameters	Norms as per IS: 10500-2012											
		Desirable Limit	Desirable Limit	21-04-20	22-04-20	23-04-20	24-04-20	25-04-20	26-04-20	27-04-20	28-04-20	29-04-20	30-04-20
1	pH value (25°C)	6.5 - 8.5	6.5 - 8.5	7.52	7.51	7.56	7.54	7.52	7.48	7.52	7.46	7.44	7.50
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Manda
Prepared by



Puja Mohanty
Verified by





Ref: Envlab/20/084

Date: 03.05.2020

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Confluence Point at Kassia Nalla
SW-2: Intake Pint at Tindharia**
3. Date of Analysis : **27.04.2020 TO 02.05.2020**
4. Sample collected by : **VCSPL Representative in presence of TATA Representative**

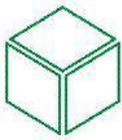
Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class -'C'	Analysis Results	
					25.04.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.4	6.6
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	140	160
4	pH Value	APHA 4500H ⁺ B	--	6.0-9.0	7.61	7.66
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	186	180
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.02	<0.02
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.31	0.36
9	Chloride (max)	APHA 4500Cl ⁻ B	mg/l	600	66	68
10	Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	4.6	5
11	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	3.4	4
12	Fluoride as F (max)	APHA 4500F C	mg/l	1.5	0.028	0.032
13	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
14	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
15	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
16	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.004	<0.004
17	Cyanide as CN (max)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
18	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
19	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
20	Hexa Chromium as Cr ⁺⁶	APHA 3500Cr B	mg/l	0.05	<0.01	<0.01
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2

M. Panda
Prepared by



Pooja Mohanty
Verified by





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001:2008

ISO 14001:2015

OHSAS 45001:2018

Ref: Envlab/20/085

Date: 03.05.2020

DOMESTIC EFFLUENT WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
 2. Sampling Location : STPW-1: STP-Inlet
 STPW-2: STP-Outlet
 3. Date of sampling : 13.04.2020
 4. Date of analysis : 14.04.2020 TO 20.04.2020
 5. Sample collected by : VCSPL Representative in presence of TATA Representative

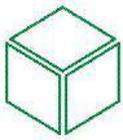
Sl. No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results	
					STPW-1	STPW-2
1	Colour & Odour	APHA 2120 B, C & APHA 2150 B	Hazen	Colourless/Odourless as far as practicable	<5 & pungent smell	<5 & U/O
2	Suspended Solids	APHA 2540 D	mg/l	100	90	52
3	Particulate size of SS	APHA 2540 D		Shall pass 850 micron IS Sieve	< 850	< 850
4	pH Value	APHA 4500H ⁺ B	--	5.5-9.0	6.88	7.16
5	Temperature	APHA 2550-B	°C	Shall not exceed 5°C above the receiving water temperature	28	28
6	Oil & Grease(max)	APHA 5520 B	mg/l	10	3.6	ND
7	Total Residual Chlorine	APHA 4500Cl, B	mg/l	1	ND	ND
8	Ammonical Nitrogen (as N)	APHA 4500-NH ₃ C	mg/l	50	8.2	1.8
9	Total Kjeldahl nitrogen (as NH ₃)	APHA 4500-N _{org} C	mg/l	100	13.2	7.2
10	Free ammonia (as NH ₃)	APHA 4500-NH ₃ F	mg/l	5	ND	ND
11	BOD(3 days at 27°C (max)	APHA 5210 B	mg/l	30	31.4	6.6
12	Chemical Oxygen Demand as COD	APHA 5220-C	mg/l	250	190	46
13	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
14	Mercury (Hg)	APHA 3500 Hg	mg/l	0.01	<0.001	<0.001
15	Lead as Pb(max)	APHA 3111 B, C	mg/l	0.1	<0.01	<0.01
16	Cadmium as Cd (max)	APHA 3111 B, C	mg/l	2	<0.001	<0.001
17	Hexavalent Chromium as Cr ⁺⁶	APHA 3500Cr B	mg/l	0.1	<0.05	<0.05
18	Total Chromium (Cr)	APHA3500-Cr, B	mg/l	2	<0.05	<0.05
19	Copper as Cu (max)	APHA 3111 B, C	mg/l	3	<0.05	<0.05
20	Zinc as Zn(max)	APHA 3111 B, C	mg/l	5	0.62	<0.05
21	Selenium (Se) (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
22	Nickel (Ni)	APHA 3500-Ni	mg/l	3	<0.001	<0.001
23	Cyanide as CN (max)	APHA 4500 CN- C,D	mg/l	0.2	ND	ND
24	Fluoride as F (max)	APHA 4500F- C	mg/l	2	0.36	0.031
25	Dissolved Phosphates (P)	APHA4500-P D	mg/l	5	0.051	<0.05
26	Sulphide (S)	APHA 4500-S ₂ -D	mg/l	2	< 0.1	< 0.1
27	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B, D	mg/l	1	<0.001	<0.001
28	Bio-assay test	APHA 8910-C		90% survival of fish after 96 hours in 100% effluent	96% survival of fishes	98% survival of fishes
29	Manganese (Mn)	APHA 3500-Mn, B	mg/l	2	0.046	<0.005
30	Iron as Fe (max)	APHA3500-Fe, B	mg/l	3	1.82	0.66
31	Vanadium (V)	APHA 3500-V	mg/l	0.2	<0.001	<0.001
32	Nitrate Nitrogen	APHA 4500-NO ₃ E	mg/l	10	5.6	1.6

Prepared by



Verified by





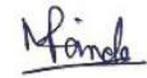
Ref: Envlab/20/086

Date: 03.05.2020

FUGITIVE DUST ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sample collected by : VCSPL Representative in presence of TATA Representative

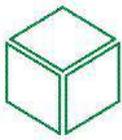
	Sampling Location			Apr-20
L-1	Near Sorting Yard (Joribar Block)	Prescribed Standard	Monitoring Date	15.04.2020
Parameters	Method of Measurement			
SPM	Gravimetric method	1200($\mu\text{g}/\text{m}^3$)		711.2
L-2	Near Stack Yard(Joribar Block)	Prescribed Standard	Monitoring Date	15.04.2020
Parameters	Method of Measurement			
SPM	Gravimetric method	1200($\mu\text{g}/\text{m}^3$)		568.8
L-3	Near Haul Road (Joribar Block)	Prescribed Standard	Monitoring Date	15.04.2020
Parameters	Method of Measurement			
SPM	Gravimetric method	1200($\mu\text{g}/\text{m}^3$)		524.2


Prepared by




Verified by





Ref: Envlab/20/087

Date: 03.05.2020

DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sampling location : DW-1: Near Canteen
3. Date of sampling : 21.04.2020
4. Date of analysis : 22.04.2020 TO 27.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

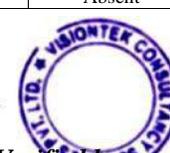
Sl. No	Parameter	Testing Methods	Unit	Norms as per IS:10500-2012 Amended on 2015 & 2018		Analysis Results
				Desirable Limit	Permissible Limit	DW-1
Microbiological Analysis						
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
2	Fecal Coliforms	APHA9221-E	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100 ml sample		Absent
Chemical Analysis						
	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
1	Colour	APHA 2120 B,	Hazen	5	15	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	pH value at 25°C	APHA 4500H ⁺ B	NTU	6.5-8.5	No Relaxation	7.61
5	Turbidity	APHA 2130 B	--	1	5	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	500	2000	112
7	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	0.2	<0.001
8	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	1	<0.2
9	Boron (as B)	APHA 4500B, B	mg/l	0.5	2.4	<0.01
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	200	51.2
11	Chloride (as Cl)	APHA 4500Cl B	mg/l	250	1000	48
12	Copper (as Cu)	APHA 3111 B	mg/l	0.05	1.5	<0.05
13	Fluoride (as F)	APHA 4500F- D	mg/l	0.05	1.5	<0.01
14	Residual Free Chlorine	APHA 4500Cl, B	mg/l	0.2	1	ND
15	Iron (as Fe)	APHA 3500Fe, B	mg/l	1.0	No Relaxation	0.24
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	26
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.005
18	Mineral Oil	APHA 5220 B	mg/l	0.5	No Relaxation	<0.01
19	Nitrate (as NO ₃)	APHA 4500 NO3- E	mg/l	45	No Relaxation	3.2
20	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	0.002	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	No Relaxation	5.6
22	Sulphate (as SO ₄)	APHA 4500 SO42- E	mg/l	200	400	5.2
23	Alkalinity (as CaCO ₃)	APHA 2320 B	mg/l	200	600	61.2
24	Total Hardness(as CaCO ₃)	APHA 2340 C	mg/l	200	600	74
25	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	No Relaxation	<0.001
26	Cyanide (as CN)	APHA 4500 CN- C,D	mg/l	0.05	No Relaxation	ND
27	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	No Relaxation	<0.01
28	Mercury (as Hg)	APHA 3500 Hg B	mg/l	0.001	No Relaxation	<0.001
29	Arsenic (as As)	APHA 3114 B	mg/l	0.01	0.05	<0.001
30	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	15	<0.05
31	Chromium (as Cr+6)	APHA 3500Cr B	mg/l	--	--	<0.05
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	0.0001	No Relaxation	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	--	No Relaxation	Absent

Mande

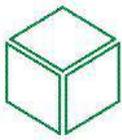


Prepared by

Puja Mohanty



Verified by



Ref: Envlab/20/088

Date: 03.05.2020

OIL SEPRATION PIT WATER QUAITY ANALYSIS REPORT-APRIL-2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
 2. Sampling Location : **WW-1: Workshop Water**
 3. Date of sampling : 17.04.2020
 4. Date of analysis : 18.04.2020 to 24.04.2020
 5. Sample collected by : VCSPL Representative in presence of TATA Representative

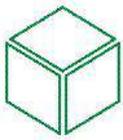
Sl.	Parameters	Unit	Testing Method	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B,C	5	CL
2	Odour	-	APHA 2150 B	Unobjectionable	U/O
3	pH at 25 degree C	-	APHA 4500 H ⁺ B	5.5-9.0	7.46
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	156
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.02
6	Fluoride as F	mg/l	APHA 4500 F ⁻ C	2.0	0.038
7	Total Residual Chlorine	mg/l	APHA 4500 Cl, b	1.0	ND
8	Iron as Fe	mg/l	APHA 3500 Fe B	3.0	0.68
9	Manganese as Mn	mg/l	APHA 3500 Mn B	2.0	1.41
10	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ E	10.0	4.42
11	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530 B,D	1.0	<0.05
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500 Ni	3.0	<0.05
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.004
19	Total Chromium as Cr	mg/l	APHA 3500 Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr ⁺⁶	mg/l	APHA 3500 Cr B	0.1	<0.01
22	Vanadium as V	mg/l	APHA 3500 V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	56
24	Temperature	°C	APHA 2550 B	shall not exceed 50C above the receiving water temperature	26
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.4
26	BOD	mg/l	APHA 5210 B	30	<1.8
27	COD	mg/l	APHA 5220 C	250	32
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500 NH ₃ C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500 N _{ORG} C	100	2.4
31	Sulphide as S	mg/l	APHA 4500 S ₂ D	2.0	ND
32	Free Ammonia as NH ₃	mg/l	APHA 4500 NH ₃ F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910 C	90% survival in 100% effluent	94% survival in 100% effluent
35	Dissolved Phosphates as PO ₄	mg/l	APHA 4500 P D	5.0	<0.05

Prepared by *[Signature]*



Verified by *[Signature]*





Ref: Envlab/20/089

Date: 03.05.2020

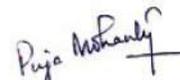
AMBIENT NOISE MONITORING REPORT FOR APRIL-2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitored by : VCSPL Representative in presence of TATA Representative

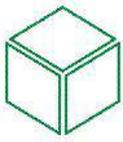
Sl. No	Monitoring Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	24.04.2020	Town ship	dB (A)	66	75	50.6	70
2		Hospital		48	50	32	40
3		Mines Area		69	75	42	70


Prepared by




Verified by





Ref: Envlab/20/090

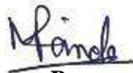
Date: 03.05.2020

PERSONAL DUST SAMPLING ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

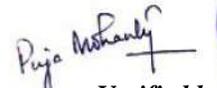
Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**

Sample collected by : VCSPL representative in presence of TATA representative.

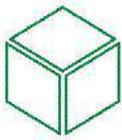
Sl.No	Date of sampling	Name of the Person	Personal Number	Standard	Particulate matter as PM (mg/m ³)
1	21.04.2020	Ialatendu Lohar	TSP/798688/0919	5 mg/m ³	4.6
2		Santana Munda	TSP/753276/0819		4.4
3		Bigneswari Malakut	BMM-236		4.2
4		Johan Hembram	MW0719167159		4.1
5		Saraswati Tanti	MW0719166977		3.8
6		Shradhanjali Maharana	MW0719167124		3.6
7		Bhaina Hembram	MW0719166713		3.2
8		Parinda Munda	MW0719167743		4.1


Prepared by




Verified by





Ref: Envlab/20/091

Date: 03.05.2020

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sampling location : **GW-1: Joribahal Pump house**
GW-2: Nimera Village-OW
3. Date of sampling : 16.04.2020
4. Date of analysis : 17.04.2020 TO 22.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

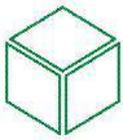
Sl. No	Parameter	Testing Methods	Unit	Standard as Per IS 10500:2012	Analysis Results	
					GW-1	GW-2
1	Color	APHA 2120 B, C	Hazen	5	CL	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	1	1.26	1.4
5	pH Value	APHA 4500H+ B	--	6.5-8.5	7.52	7.44
6	Total Hardness (as CaCO ₃)	APHA 2540 C	mg/l	300	108.0	122.0
7	Iron (as Fe)	APHA 3500Al B	mg/l	0.3	0.22	0.28
8	Chloride (as Cl ⁻)	APHA 5540 C	mg/l	250	44.0	52.0
9	Residual, free Chlorine	APHA 4500B, B	mg/l	0.2	ND	ND
10	Dissolved Solids	APHA 3500Ca B	mg/l	500	208.0	212.0
11	Calcium (as Ca ²⁺)	APHA 4500Cl- B	mg/l	75	46.0	51.2
12	Magnesium (as Mg ²⁺)	APHA 3111 B,C	mg/l	30	22.6	24.0
13	Copper (as Cu)	APHA 4500F- C	mg/l	0.05	<0.02	<0.02
14	Manganese (as Mn)	APHA 4500Cl, B	mg/l	0.1	0.02	0.012
15	Sulphate (as SO ₄ ²⁻)	APHA 3500Fe, B	mg/l	200	5.2	5.8
16	Nitrate (as NO ₃ ⁻)	APHA 3500Mg B	mg/l	45	4.2	3.8
17	Fluoride (as F ⁻)	APHA 3500Mn B	mg/l	1	0.018	0.024
18	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5220 B	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 4500 NO ₃ ⁻ E	mg/l	0.001	<0.002	<0.002
20	Cadmium (as Cd)	APHA 5530 B,D	mg/l	0.003	<0.01	<0.01
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001
22	Arsenic (as As)	APHA 4500 SO ₄ ²⁻ E	mg/l	0.01	<0.004	<0.004
23	Cyanide (as CN ⁻)	APHA 2320 B	mg/l	0.05	<0.01	<0.01
24	Lead (as Pb)	APHA 2340 C	mg/l	0.01	<0.01	<0.01
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	3.6	4.2
26	Anionic Detergents (as MBAS)	APHA 4500 CN- C,D	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr ⁺⁶)	APHA 3111 B,C	mg/l		<0.01	<0.01
28	Mineral Oil	APHA 3500 Hg	mg/l	0.01	<0.01	<0.01
29	Alkalinity	APHA 3114 B	mg/l	200	78.0	84.0
30	Aluminium as(Al)	APHA 3111 B,C	mg/l	0.03	<1.0	<1.0
31	Boron (as B)	APHA 3500Cr B	mg/l	0.5	<0.1	<0.1
32	Poly Aromatic Hydrocarbon (as PAH)	APHA 6440 B	µg/l	<0.0001	<0.0001	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent

Manda
Prepared by



Puja Mohanty
Verified by





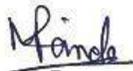
Ref: Envlab/20/092

Date: 03.05.2020

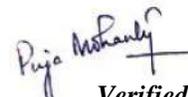
GROUND WATER LEVEL ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **GWL-1: Joribahal Pump house
GWL-2: Nimera Village-OW**
3. Date of sampling : 16.04.2020
4. Sample collected by : VCSPL Representative in presence of TATA Representative

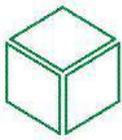
SL.NO	Monitoring Date	Analysis Result (mt/bgl)
1	Joribahal Pump House	6.8
2	Nimera Village (OW)	4.2


Prepared by




Verified by





Ref: Envlab/20/093

Date: 03.05.2020

GROUND WATER TRACE METALS ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Date of sampling : 16.04.2020
3. Sample collected by : VCSPL Representative in presence of TATA Representative

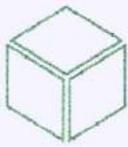
Sl. No	Parameter	Testing Methods	Unit	Standard as per IS - 10500:2012 Amended on 2015 & 2018	Analysis Results	
					GW-1:B/W at Panchayat Office	GW-2: Nimera Village OW
1	Iron (as Fe)	APHA 3500Fe, B	mg/l	1	0.32	0.26
2	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	< 0.05	< 0.05
3	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.014	0.012
4	Chromium (as Cr ⁺⁶)	APHA 3500Cr B	mg/l		< 0.05	< 0.05
5	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	< 0.001	< 0.001
6	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	< 0.01	< 0.01
7	Selenium (as Se)	APHA 3114 B	mg/l	0.01	< 0.001	< 0.001
8	Arsenic (as As)	APHA 3114 B	mg/l	0.01	< 0.001	< 0.001
9	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	< 0.01	< 0.01
10	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	2.4	2.8

Manch
Prepared by



Puja Mohanty
Verified by





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: Env Lab/20/R-0492

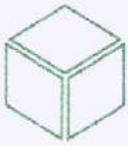
Date: 01/06/2020

METEOROLOGICAL DATA FOR MAY-2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
 2. Sampling Location : Mines Office
 3. Sample collected by : VCSPL representative in presence of TATA representative.

Date	Temperature(°C)		Relative Humidity (%)		Wind Speed m/sec		Wind Direction	Rain fall (mm)
	Max	Min	Max	Min	Max	Min		
1-May-20	35.8	24.8	94.8	31.8	3.8	2.1	SE	1.2
2-May-20	34.6	28.1	84.6	35.2	5.1	2.6	SE	0.6
3-May-20	36.6	24.6	91.4	26.2	5.9	2.8	SE	0
4-May-20	34.8	21.8	90.8	60.2	4.4	3.2	SE	6.8
5-May-20	37.8	21.9	90.2	35.2	3.8	2.6	SE	0.3
6-May-20	35.6	26.8	87.8	43.2	4	2.8	SE	0.2
7-May-20	39.2	27.6	80.2	29.6	4.1	1.4	WSW	0
8-May-20	39.6	27.8	82.4	26.2	3.6	1.6	SE	0
9-May-20	39.2	28.8	71.2	30.8	3.4	2.1	SE	0
10-May-20	38.6	27.6	80.2	24.2	6.8	1.6	SE	0
11-May-20	37.2	26.6	74.4	34.2	5.6	1.8	SW	0
12-May-20	39.6	30.2	66.8	32.2	4.6	1.4	SSE	0
13-May-20	36.2	26.8	64.8	27.4	4.7	2.1	SSE	0
14-May-20	39.2	27.4	63.2	22.8	4.2	2.2	SW	0
15-May-20	38.8	25.8	61.6	25.2	4.1	2.4	SW	0
16-May-20	39.2	25.6	88.2	31.6	3.6	2.1	SW	0.4
17-May-20	40.8	28.2	86.2	23.2	3.8	1.6	S	0
18-May-20	40.2	25.6	91.2	24.4	7.6	1.5	SE	0
19-May-20	29.6	24.2	79.6	38.2	5.6	2.1	S	0
20-May-20	25.6	20.1	86.2	40.4	14.8	4.2	SE	27.6
21-May-20	34.8	21.8	80.2	38.1	5.1	2.6	E	0.4
22-May-20	40.2	25.9	81.6	29.6	4	2.5	NE	0
23-May-20	40.4	25.6	84.8	23.8	4.6	3.1	NW	0
24-May-20	39.6	26.8	91.2	30.2	5.6	3.2	SW	0
25-May-20	38.8	25.2	90.6	26.2	4.8	3.4	SE	0
26-May-20	41.6	25.8	88.2	47.6	5.8	2.8	SE	0
27-May-20	42.8	26.6	85.8	40.6	4.2	3.4	SW	0.6
28-May-20	36.2	27.4	78.8	34.8	5.1	2.6	SW	1.1
29-May-20	38.1	25.8	80.6	37.2	4.7	2.8	S	2.1
30-May-20	38.8	24.6	91.2	33.1	4.6	2.8	SE	1.6
31-May-20	39.1	27.8	83.6	40.2	3.6	2.4	SE	1.8





Ref:
EnvLab/20/R-
02/93

AMBIENT AIR QUALITY MONITORING REPORT FOR MAY -2020 (CORE ZONE)

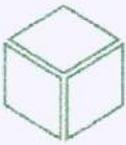
1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : AAQMS-I:Office Building
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS												
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NOx (µg/m ³)	O ₃ (µg/m ³)	CO mg/m ³	NH ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	C ₆ H ₆ (µg/m ³)	BaP (ng/m ³)	Mn (µg/m ³)
04.05.2020	61.6	36.9	8.8	12.6	7.1	0.44	26.6	BDL	BDL	BDL	BDL	BDL	BDL
07.05.2020	62.8	37.7	8.4	12.2	7.6	0.46	26.2	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2020	63.2	37.9	9.2	13.4	7.2	0.42	25.8	BDL	BDL	BDL	BDL	BDL	BDL
14.05.2020	64.8	38.8	9.4	13.6	7.4	0.38	25.2	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2020	65.2	39.1	9.1	14.2	8.1	0.41	24.6	BDL	BDL	BDL	BDL	BDL	BDL
21.05.2020	66.8	40.1	8.6	14.1	8.4	0.42	24.8	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2020	72.6	43.6	8.2	13.8	8.6	0.44	23.2	BDL	BDL	BDL	BDL	BDL	BDL
28.05.2020	74.8	45	7.8	15.2	8.2	0.44	23.6	BDL	BDL	BDL	BDL	BDL	BDL
Average	66.5	39.9	8.7	13.6	7.8	0.4	25.0	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part -23)-1999	USEPA CFR-40, Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182: Part-10-1999	Air Sampling, 3rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114 C	IS 5182: Part. 11	IS 5182: Part. 12	EPA IO-3.2

BDL Values: SO₂ < 4 µg/m³, NO_x < 9 µg/m³, O₃ < 4 µg/m³, NH₃ < 20 µg/m³, Ni < 0.01 ng/m³, As < 0.001 ng/m³, C₆H₆ < 0.001 µg/m³, BaP < 0.002 ng/m³, Pb < 0.001 µg/m³, CO < 0.1 mg/m³, Mn < 0.001 µg/m³

Date: 01/06/2020





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008
ISO 14001: 2015
OHSAS 45001: 2018

Ref:
EnvLab/2019-0494

Date: 01/06/2020

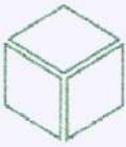
AMBIENT AIR QUALITY MONITORING REPORT FOR MAY-2020 (CORE ZONE)

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : AAQMS-2: Mines Pit
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS											Mn ($\mu\text{g}/\text{m}^3$)	
	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NOx ($\mu\text{g}/\text{m}^3$)	O ₃ ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)	NH ₃ ($\mu\text{g}/\text{m}^3$)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	As (ng/m^3)	C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)		BaP (ng/m^3)
04.05.2020	61.2	36.7	14.2	18.6	7.8	0.66	24.2	BDL	BDL	BDL	BDL	BDL	BDL
07.05.2020	61.8	37.1	15.2	19.2	8.4	0.64	24.4	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2020	62.6	37.6	15.6	19.6	8.6	0.72	25.6	BDL	BDL	BDL	BDL	BDL	BDL
14.05.2020	63.2	37.9	12.8	16.9	8.2	0.69	25.8	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2020	63.8	38.2	13.2	17.4	7.2	0.52	25.6	BDL	BDL	BDL	BDL	BDL	BDL
21.05.2020	64.6	38.8	13.6	17.8	7.6	0.54	26.2	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2020	60.8	36.6	12.8	18.8	7.2	0.48	27.4	BDL	BDL	BDL	BDL	BDL	BDL
28.05.2020	60.2	36.1	12.4	19.2	7.4	0.44	26.4	BDL	BDL	BDL	BDL	BDL	BDL
Average	62.3	37.4	13.7	18.4	7.8	0.6	25.7	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	20	6	5	1	---	
Sampling and Analysis done according to	IS: 5182(Part-23)-1999	USEPA CFR-40,Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 : Part-10-1999	Air Sampling, 3rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	APHA 22nd-3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO-3.2	

BDL Values: SO₂<4 $\mu\text{g}/\text{m}^3$, NO_x<9 $\mu\text{g}/\text{m}^3$, O₃<4 $\mu\text{g}/\text{m}^3$, NH₃<20 $\mu\text{g}/\text{m}^3$, Ni<0.01 ng/m^3 , As<0.001 ng/m^3 , C₆H₆<0.001 $\mu\text{g}/\text{m}^3$, BaP<0.001 $\mu\text{g}/\text{m}^3$, CO<0.1 mg/m^3 , Mn<0.001 $\mu\text{g}/\text{m}^3$





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref:

EnvLab/20/R-0495

AMBIENT AIR QUALITY MONITORING REPORT FOR MAY-2020 (CORE ZONE)

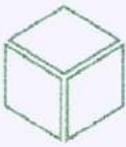
1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : AAQMS-3: Weigh Bridge
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS											Mn ($\mu\text{g}/\text{m}^3$)	
	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NOx ($\mu\text{g}/\text{m}^3$)	O ₃ ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)	NH ₃ ($\mu\text{g}/\text{m}^3$)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	As (ng/m^3)	C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)		BaP (ng/m^3)
04.05.2020	63.2	38.2	8.4	16.1	7.8	0.56	24.8	BDL	BDL	BDL	BDL	BDL	BDL
07.05.2020	62.2	37.3	8.2	16.2	8.2	0.52	25.6	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2020	62.4	37.4	8.8	16.6	8.4	0.54	25.8	BDL	BDL	BDL	BDL	BDL	BDL
14.05.2020	63.2	38	8.1	17.2	8.6	0.58	26.6	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2020	63.8	38	8.5	16.8	9.1	0.62	26.8	BDL	BDL	BDL	BDL	BDL	BDL
21.05.2020	62.2	37	8.3	16.2	8.8	0.66	27.4	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2020	62.8	37.2	8.2	17.4	8.4	0.61	28.8	BDL	BDL	BDL	BDL	BDL	BDL
28.05.2020	64.1	38.6	8.4	16.9	8.2	0.62	28.1	BDL	BDL	BDL	BDL	BDL	BDL
Average	63.0	37.7	8.4	16.7	8.4	0.6	26.7	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part-23)-1999	USEPA CFR-40,Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182: Part-10-1999	Air Sampling, 3rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114 C	IS 5182: Part 11	IS 5182: Part 12	EPA IO-3.2

Date: 01/06/2020

BDL Values: SO₂<4 $\mu\text{g}/\text{m}^3$, NO_x<9 $\mu\text{g}/\text{m}^3$, O₃<4 $\mu\text{g}/\text{m}^3$, NH₃<20 $\mu\text{g}/\text{m}^3$, Ni<0.01 ng/m^3 , As < 0.001 ng/m^3 , C₆H₆<0.001 $\mu\text{g}/\text{m}^3$, BaP<0.002 ng/m^3 , Pb<0.001 $\mu\text{g}/\text{m}^3$, CO-<0.1 mg/m^3 , Mn<0.001 $\mu\text{g}/\text{m}^3$





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref:
EnvLab/20/P-0496

Date: 01/06/2020

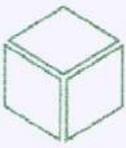
AMBIENT AIR QUALITY MONITORING REPORT FOR MAY-2020 (BUFFER ZONE)

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer
3. Sample Collected by : VCSPL Representative in presence of TATA Representative

Date	PARAMETERS											HC (ng/m ³)	
	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	O ₃ (µg/m ³)	CO (mg/m ³)	NH ₃ (µg/m ³)	Pb (µg/m ³)	Ni (ng/m ³)	As (ng/m ³)	C ₆ H ₆ (µg/m ³)		BaP (ng/m ³)
Jaganathpur 13.05.2020	66.8	40.6	6.8	13.2	11.8	0.78	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bandhubaria 13.05.2020	70.6	42.4	7.8	13.4	12.6	0.92	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Raikara 16.05.2020	71.8	44.8	8.4	11.2	9.2	0.88	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part -23)-1999	USEPA CFR- 40,Part- 50, Appendix- L	IS: 5182 (Part-2)- 2001	IS: 5182 (Part-6)- 2006	IS: 5182 (Part-9)- 1974	IS 5182 : Part.10- 1999	Air Sampling, 3rd Edn.By James P. Lodge (Method- 401)	EPA IO- 3.2	EPA IO- 3.2	APHA 22nd- 3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	-

BDL Values: SO₂ < 4 µg/m³, NO_x < 9 µg/m³, CO < 0.1 mg/m³, HC < 0.00 mg/m³





Ref: EnvLab/20/R-0497

Date: 01/06/2020

DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sampling location : DW-1: Near Canteen
3. Date of sampling : 06.05.2020
4. Date of analysis : 07.05.2020 TO 12.05.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Norms as per IS:10500-2012 Amended on 2015 & 2018		Analysis Results
				Desirable Limit	Permissible Limit	DW-1
Microbiological Analysis						
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
2	Fecal Coliforms	APHA9221-E	MPN/100ml			<1.1
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100 ml sample		Absent
Chemical Analysis						
	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
1	Colour	APHA 2120 B,	Hazen	5	15	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	pH value at 25°C	APHA 4500H ⁺ B	NTU	6.5-8.5	No Relaxation	7.68
5	Turbidity	APHA 2130 B	--	1	5	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	500	2000	118
7	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	0.2	<0.001
8	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	1	<0.2
9	Boron (as B)	APHA 4500B, B	mg/l	0.5	2.4	<0.01
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	200	54.6
11	Chloride (as Cl)	APHA 4500Cl ⁻ B	mg/l	250	1000	52
12	Copper (as Cu)	APHA 3111 B	mg/l	0.05	1.5	<0.05
13	Fluoride (as F)	APHA 4500F- D	mg/l	0.05	1.5	<0.01
14	Residual Free Chlorine	APHA 4500Cl, B	mg/l	0.2	1	ND
15	Iron (as Fe)	APHA 3500Fe, B	mg/l	1.0	No Relaxation	0.28
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	28
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.005
18	Mineral Oil	APHA 5220 B	mg/l	0.5	No Relaxation	<0.01
19	Nitrate (as NO ₃)	APHA 4500 NO ₃ - E	mg/l	45	No Relaxation	3.8
20	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	0.002	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	No Relaxation	6.2
22	Sulphate (as SO ₄)	APHA 4500 SO ₄ - E	mg/l	200	400	5.6
23	Alkalinity (as CaCO ₃)	APHA 2320 B	mg/l	200	600	66.8
24	Total Hardness(as CaCO ₃)	APHA 2340 C	mg/l	200	600	80.2
25	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	No Relaxation	<0.001
26	Cyanide (as CN)	APHA 4500 CN- C,D	mg/l	0.05	No Relaxation	ND
27	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	No Relaxation	<0.01
28	Mercury (as Hg)	APHA 3500 Hg B	mg/l	0.001	No Relaxation	<0.001
29	Arsenic (as As)	APHA 3114 B	mg/l	0.01	0.05	<0.001
30	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	15	<0.05
31	Chromium (as Cr+6)	APHA 3500Cr B	mg/l	--	--	<0.05
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	0.0001	No Relaxation	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	--	No Relaxation	Absent

NoNote:CL:Colourless, ND: Not Detected.





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref:
ENVLab/201
R-0498

DAILY DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-2020

- Name of Industry : Bambari Manganese Mines (M/s TATA Steel Limited)
- Sampling location : DW-1: Water Treatment Plant
- Sample collected by : VCSPL Representative in presence of TATA Representative

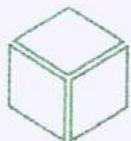
Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012		5/1/2020	5/2/2020	5/3/2020	5/4/2020	5/5/2020	5/6/2020	5/7/2020	5/8/2020	5/9/2020	5/10/2020	5/11/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	Permissible Limit No Relaxation	7.66	7.62	7.61	7.64	7.58	7.66	7.71	7.72	7.70	7.74	7.76
2	Turbidity in NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	1	ND	ND									

Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012		5/12/2020	5/13/2020	5/14/2020	5/15/2020	5/16/2020	5/17/2020	5/18/2020	5/19/2020	5/20/2020	5/21/2020	5/22/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	Desirable Limit 6.5 - 8.5	7.78	7.66	7.64	7.65	7.66	7.62	7.58	7.55	7.56	7.58	7.56
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND										

Sl No	Test Parameters	Analysis Results											
		Norms as per IS: 10500-2012		5/23/2020	5/24/2020	5/25/2020	5/26/2020	5/27/2020	5/28/2020	5/29/2020	5/30/2020	5/31/2020	
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	Desirable Limit 6.5 - 8.5	7.55	7.58	7.62	7.66	7.68	7.66	7.64	7.61	7.66	
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND									

Date: 01/06/2020





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008

ISO 14001 : 2015

OHSAS 45001 : 2018

Ref: EnvLab/20/R-0499

Date: 01/06/2020

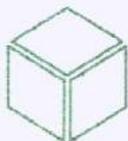
SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-2020

- Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
- Sampling location : SW-1: Confluence Point at Kassia Nalla
SW-2: Intake Pint at Tindharia
- Date of Analysis : 20.02.2020 TO 26.02.2020
- Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class -'C'	Analysis Results	
					19.02.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	-6.2	6.8
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	160	180
4	pH Value	APHA 4500H ⁺ B	--	6.0-9.0	7.58	7.62
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	184	172
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.02	<0.02
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.34	0.4
9	Chloride (max)	APHA 4500Cl ⁻ B	mg/l	600	66	70
10	Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	4.6	5.4
11	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	3.4	4.6
12	Fluoride as F (max)	APHA 4500F ⁻ C	mg/l	1.5	0.028	0.034
13	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
14	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
15	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
16	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.004	<0.004
17	Cyanide as CN (max)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
18	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
19	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
20	Hexa Chromium as Cr ⁺⁶	APHA 3500Cr B	mg/l	0.05	<0.01	<0.01
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2

Note: ND: Not Detected





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: EnvLab/20/R-0500

Date: 01/06/2020

DOMESTIC EFFLUENT WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-20

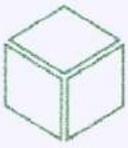
1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sampling Location : STPW-1: STP-Inlet
STPW-2: STP-Outlet
3. Date of sampling : 06.05.2020
4. Date of analysis : 07.05.2020 TO 12.05.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results	
					STPW-1	STPW-2
1	Colour & Odour	APHA 2120 B, C & APHA 2150 B	Hazen	Colourless/Odourless as far as practicable	<5 & pungent smell	<5 & U/O
2	Suspended Solids	APHA 2540 C	mg/l	100	88	46
3	Particulate size of SS	APHA 2540 C		Shall pass 850 micron IS Sieve	< 850	< 850
4	pH Value	APHA 4500H ⁺ B	--	5.5-9.0	6.92	7.28
5	Temperature	APHA 2550-B	°C	Shall not exceed 5°C above the receiving water temperature	34	34
6	Oil & Grease(max)	APHA 5520 B	mg/l	10	3.8	ND
7	Total Residual Chlorine	APHA 4500Cl ₂ B	mg/l	1	ND	ND
8	Ammonical Nitrogen (as N)	APHA 4500-NH ₃ C	mg/l	50	8.6	2.1
9	Total Kjeldahl nitrogen (as NH ₃)	APHA 4500-N _{org} C	mg/l	100	13.8	7.8
10	Free ammonia (as NH ₃)	APHA 4500-NH ₃ F	mg/l	5	ND	ND
11	BOD(3 days at 27°C (max)	IS 3025 (P-44) 1993 RA 2003	mg/l	30	28.8	6.2
12	Chemical Oxygen Demand as COD	APHA 5220-C	mg/l	250	196	42
13	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
14	Mercury (Hg)	APHA 3500 Hg	mg/l	0.01	<0.001	<0.001
15	Lead as Pb(max)	APHA 3111 B, C	mg/l	0.1	<0.01	<0.01
16	Cadmium as Cd (max)	APHA 3111 B, C	mg/l	2	<0.001	<0.001
17	Hexavalent Chromium as Cr ^{VI}	APHA 3500Cr B	mg/l	0.1	<0.05	<0.05
18	Total Chromium (Cr)	APHA3500-Cr, B	mg/l	2	<0.05	<0.05
19	Copper as Cu (max)	APHA 3111 B, C	mg/l	3	<0.05	<0.05
20	Zinc as Zn(max)	APHA 3111 B, C	mg/l	5	0.68	<0.05
21	Selenium (Se) (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
22	Nickel (Ni)	APHA 3500-Ni	mg/l	3	<0.001	<0.001
23	Cyanide as CN (max)	APHA 4500 CN- C, D	mg/l	0.2	ND	ND
24	Fluoride as F (max)	APHA 4500F- C	mg/l	2	0.42	0.038
25	Dissolved Phosphates (P)	APHA4500-P D	mg/l	5	0.056	<0.05
26	Sulphide (S)	APHA 4500-S ₂ -D	mg/l	2	< 0.1	< 0.1
27	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B, D	mg/l	1	<0.001	<0.001
28	Bio-assay test	APHA 8910-C		90% survival of fish after 96 hours in 100% effluent	94% survival of fishes	98% survival of fishes
29	Manganese (Mn)	APHA 3500-Mn, B	mg/l	2	0.041	<0.005
30	Iron as Fe (max)	APHA3500-Fe, B	mg/l	3	1.88	0.62
31	Vanadium (V)	APHA 3500-V	mg/l	0.2	<0.001	<0.001
32	Nitrate Nitrogen	APHA 4500-NO ₃ E	mg/l	10	5.8	2.1

N

ote: U/O:Unobjectionable, ND:Not Detected.





Ref: EnvLab/20/R-0501

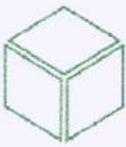
Date: 01/06/2020

AMBIENT NOISE MONITORING REPORT FOR MAY-20

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitored by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Monitoring Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	23.05.2020	Town ship	dB (A)	68	75	56	70
2		Hospital		43.6	50	36.8	40
3		Mines Area		64	75	52	70





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008

ISO 14001 : 2015

OHSAS 45001 : 2018

Ref: EnvLab/20/R-0502

Date: 01/06/2020

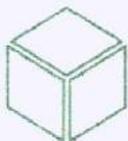
PERSONAL DUST SAMPLING ANALYSIS REPORT FOR THE MONTH OF MAY-20

Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)

Sample collected by : VCSPL representative in presence of TATA representative.

Sl.No	Date of sampling	Name of the Person	Personal Number	Standard	Particulate matter as PM (mg/m ³)
1	23.05.2020	Bigneswari Malakut	BMM-236	5 mg/m ³	4.4
2		Johan Hembram	MW0719167159		4.3
3		Shradhanjali Maharana	MW0719167124		4.1
4		Bhaina Hembram	MW0719166713		4.4
5		lalatendu Lohar	TSP/798688/0919		4.2
6		Santana Munda	TSP/753276/0819		4.5
7		Saraswati Tanti	MW0719166977		4.2
8		Parinda Munda	MW0719167743		4.8





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001:2008

ISO 14001:2015

OHSAS 45001:2018

Ref: EnvLab/20/R-0503

Date: 01/06/2020

FUGITIVE EMISSION ANALYSIS REPORT FOR THE MONTH OF MAY-20

Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)

Sample collected by : VCSPL representative in presence of TATA representative.

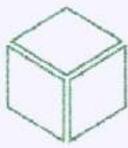
	Sampling Location			Feb-20
L-1	Near Sorting Yard (Joribar Block)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement		09.05.2020	
SPM	Gravimetric method	1200($\mu\text{g}/\text{m}^3$)		716.8
L-2	Near Stack Yard(Joribar Block)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement		09.05.2020	
SPM	Gravimetric method	1200($\mu\text{g}/\text{m}^3$)		574.2
L-3	Near Haul Road (Joribar Block)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement		10.05.2020	
SPM	Gravimetric method	1200($\mu\text{g}/\text{m}^3$)		533.8

Prepared By



Verified By





Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: EnvLab/20/R-0504

Date: 01/06/2020

OIL SEPARATION PIT WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-20

- | | | |
|------------------------|---|---|
| 1. Name of Industry | : | Bamebari Manganese Mines (M/s TATA Steel Limited) |
| 2. Sampling Location | : | WW-1: Workshop Water |
| 3. Date of sampling | : | 22.05.2020 |
| 4. Date of analysis | : | 23.05.2020 to 28.05.2020 |
| 5. Sample collected by | : | VCSPL Representative in presence of TATA Representative |

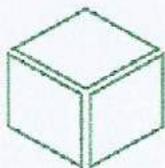
Sl.	Parameters	Unit	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
				May-20
1	Colour	Hazen	5	CL
2	Odour	-	Unobjectionable	U/O
3	pH at 25 degree C	-	5.5-9.0	7.62
4	Total Dissolved Solids	mg/l	-	152
5	Copper as Cu	mg/l	3.0	<0.02
6	Fluoride as F	mg/l	2.0	0.044
7	Total Residual Chlorine	mg/l	1.0	ND
8	Iron as Fe	mg/l	3.0	0.68
9	Manganese as Mn	mg/l	2.0	1.48
10	Nitrate as NO3	mg/l	10.0	5.8
11	Phenolic Compounds as C6H5OH	mg/l	1.0	<0.05
12	Selenium as Se	mg/l	0.05	<0.001
13	Cadmium as Cd	mg/l	2.0	<0.001
14	Cyanide as CN	mg/l	0.2	ND
15	Lead as Pb	mg/l	0.1	<0.01
16	Mercury as Hg	mg/l	0.01	<0.001
17	Nickel as Ni	mg/l	3.0	<0.05
18	Arsenic as As	mg/l	0.2	<0.004
19	Total Chromium as Cr	mg/l	2.0	<0.05
20	Zinc as Zn	mg/l	5.0	<0.05
21	Hexavalent Chromium as Cr ⁺⁶	mg/l	0.1	<0.01
22	Vanadium as V	mg/l	0.2	<0.001
23	Total Suspended Solids	mg/l	100	68
24	Temperature	0C	shall not exceed 5 ⁰ C above the receiving water temperature	34
25	Dissolved Oxygen	mg/l	-	7.1
26	BOD at 27 ⁰ C for 3 days	mg/l	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	250	40
28	Oil & Grease	mg/l	10	ND
29	Ammonical Nitrogen as N	mg/l	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	100	3.8
31	Sulphide as S	mg/l	2.0	ND
32	Free Ammonia as NH ₃	mg/l	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	850 μm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	90% survival in 100% effluent	96% survival in 100% effluent
35	Dissolved Phosphates as PO ₄	mg/l	5.0	<0.05



Plot No.-M-22&23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel: 752017905

E-mail : visiontek@vcspl.org, visiontekin@gmail.com, visiontekin@yahoo.co.in, Visit us at: www.vcspl.org

Committed For Better Environment



Ref.: Kamlab/20/R-1430

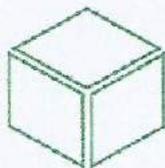
Date: 02/07/20

METEOROLOGICAL DATA FOR JUNE 2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sampling Location : Mines Office
3. Sample collected by : VCSPL representative in presence of TATA representative.

Date	Temperature(°C)		Relative Humidity (%)		Wind Speed m/sec		Wind Direction	Rain fall (mm)
	Max	Min	Max	Min	Max	Min		
1-Jun-20	38.2	26.6	90.2	56.4	4.4	2.8	S	0.6
2-Jun-20	36.2	25.2	80.8	49.6	2.8	1.4	SSW	1.3
3-Jun-20	36.4	24.4	81.2	46.6	2.9	1.6	S	0.9
4-Jun-20	35.2	28.1	78.8	52.3	3.4	0.9	SSW	3.3
5-Jun-20	36.8	27.2	84.4	41.6	6.6	2.1	SSW	1.3
6-Jun-20	37.4	28.8	73.1	40.8	4.4	1.8	WSW	0.2
7-Jun-20	36.6	28.2	69.2	42.6	2.8	1.4	SSW	0.3
8-Jun-20	37.4	25.2	73.8	44.2	4.4	0.7	SSW	8.9
9-Jun-20	38.2	24.4	71.4	42.2	4.2	0.7	SE	0.1
10-Jun-20	38.8	28.2	77.2	51.2	4.1	0.7	SE	0.9
11-Jun-20	34.2	27.2	84.8	55.2	4.4	0.8	SE	11.9
12-Jun-20	32.8	26.2	90.2	59.6	4.9	1.2	SE	16.8
13-Jun-20	34.6	27.1	89.6	57.2	3.8	1.2	SE	7.8
14-Jun-20	35.21	26.8	89.2	58.8	3.2	1.5	WSW	5.3
15-Jun-20	36.6	27.2	88.2	54.4	2.6	1.3	SW	13.6
16-Jun-20	40.2	28.2	90.6	61.2	4.4	2.1	SW	10
17-Jun-20	30.2	23.2	91.2	61.4	6.6	2.4	SW	9.3
18-Jun-20	35.2	26.2	88.2	56.2	4.9	2.6	SW	1.3
19-Jun-20	35.6	23.8	85.2	55.2	4.4	2.9	WSW	2.4
20-Jun-20	34.2	27.1	85.8	57.4	2.9	1.9	WSW	9.9
21-Jun-20	32.8	24.8	89.2	56.8	4.1	1.4	WSW	5.2
22-Jun-20	34.6	26.2	90.6	59.6	5.6	2.1	WSW	6.2
23-Jun-20	37.2	26.8	85.2	59.8	4.8	1	WSW	2.5
24-Jun-20	40.2	28.8	83.8	56.6	5.2	1.4	WSW	6
25-Jun-20	38.1	26.9	84.8	55.2	5.1	1.2	WSW	10.9
26-Jun-20	37.2	27.2	79.6	51.2	4	1.8	SW	3.1
27-Jun-20	39.2	27.3	79.2	51.8	5.3	1.8	SW	2.2
28-Jun-20	40.2	29.6	78.8	50.6	4.9	0.9	SE	3.6
29-Jun-20	38.2	27.2	80.2	50.8	3.4	2.6	WSW	4.8
30-Jun-20	39.4	27.8	80.6	53.4	4.2	1.8	S	5.9





Ref: Envlab/2019-1481

Date: 06/07/20

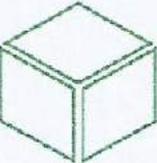
AMBIENT AIR QUALITY MONITORING REPORT FOR JUNE 2020 (CORE ZONE)

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : AAQMS-I:H- Quarry
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS												
	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	O ₃ ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)	NH ₃ ($\mu\text{g}/\text{m}^3$)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	As (ng/m^3)	C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Mn ($\mu\text{g}/\text{m}^3$)
01.06.2020	62.8	37.7	7.4	11.8	7.4	0.46	25.8	BDL	BDL	BDL	BDL	BDL	BDL
04.06.2020	63.4	38.0	7.8	12.2	8.1	0.48	25.6	BDL	BDL	BDL	BDL	BDL	BDL
08.06.2020	64.4	38.6	8.4	12.8	7.8	0.51	24.8	BDL	BDL	BDL	BDL	BDL	BDL
11.06.2020	65.6	39.4	8.6	13.2	7.6	0.54	23.6	BDL	BDL	BDL	BDL	BDL	BDL
15.06.2020	64.8	38.9	8.8	13.4	7.2	0.49	24.2	BDL	BDL	BDL	BDL	BDL	BDL
18.06.2020	64.2	38.5	8.1	12.6	7.3	0.51	24.4	BDL	BDL	BDL	BDL	BDL	BDL
22.06.2020	63.8	38.3	7.6	13.1	7.2	0.54	24.2	BDL	BDL	BDL	BDL	BDL	BDL
Average	64.14	38.49	8.10	12.73	7.51	0.50	24.66	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part-23)-2099	USEPA CFR-40, Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-2074	IS 5182: Part.10-2099	Air Sampling, 3rd Edn. By James F. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114 C	IS 5182: Part. 11	IS 5182: Part. 12	EPA IO-3.2

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$, O₃ < 4 $\mu\text{g}/\text{m}^3$, NH₃ < 20 $\mu\text{g}/\text{m}^3$, Ni < 0.01 ng/m^3 , As < 0.001 ng/m^3 , C₆H₆ < 0.001 $\mu\text{g}/\text{m}^3$, Pb < 0.002 ng/m^3 , Mn < 0.001 $\mu\text{g}/\text{m}^3$





Ref.: Envu/ab/20/R-1433

Date: 08/07/20

AMBIENT AIR QUALITY MONITORING REPORT FOR JUNE 2020 (CORE ZONE)

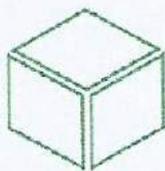
1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitoring Instruments : **RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler**
3. Sampling Location : **AAQMS-3: Weigh Bridge**
4. Sample collected by : **VCSPL representative in presence of TATA representative.**

Date	PARAMETERS												
	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	O ₃ ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)	NH ₃ ($\mu\text{g}/\text{m}^3$)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	As (ng/m^3)	C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	Mn ($\mu\text{g}/\text{m}^3$)
02.06.2020	63.8	38.3	7.8	15.8	7.8	0.56	24.8	BDL	BDL	BDL	BDL	BDL	BDL
05.06.2020	64.4	38.6	7.2	15.4	8.1	0.58	25.2	BDL	BDL	BDL	BDL	BDL	BDL
09.06.2020	64.8	38.9	7.7	16.2	8.2	0.62	24.8	BDL	BDL	BDL	BDL	BDL	BDL
12.06.2020	65.2	39.1	7.2	16.6	8.4	0.66	24.4	BDL	BDL	BDL	BDL	BDL	BDL
16.06.2020	65.8	39.5	8.1	15.9	8.8	0.61	24.2	BDL	BDL	BDL	BDL	BDL	BDL
19.06.2020	66.4	39.8	8.4	15.2	8.2	0.56	24.8	BDL	BDL	BDL	BDL	BDL	BDL
23.06.2020	64.8	38.9	8.2	16.1	8.1	0.52	25.2	BDL	BDL	BDL	BDL	BDL	BDL
Average	65.03	39.02	7.80	15.89	8.23	0.59	24.77	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	--
Sampling and Analysis done according to	IS: 5182(Part-23)-2009	USEPA CFR-40, Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-2074	IS 5182: Part-10-2099	Air Sampling, 3rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114 C	IS 5182: Part-11	IS 5182: Part-12	EPA IO-3.2



BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$, O₃ < 4 $\mu\text{g}/\text{m}^3$, NH₃ < 20 $\mu\text{g}/\text{m}^3$, Ni < 0.01 ng/m^3 , As < 0.001 ng/m^3 , C₆H₆ < 0.001 $\mu\text{g}/\text{m}^3$, BaP < 0.002 ng/m^3 , Mn < 0.001 $\mu\text{g}/\text{m}^3$





Ref.: Envlab/2019R-1434

Date: 08/07/20

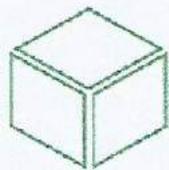
AMBIENT AIR QUALITY MONITORING REPORT FOR JUNE 2020 (BUFFER ZONE)

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Monitoring Instruments : **RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer**
3. Sample Collected by : **VCSPL Representative in presence of TATA Representative**

Date	PARAMETERS												
	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NOx ($\mu\text{g}/\text{m}^3$)	O ₃ ($\mu\text{g}/\text{m}^3$)	CO (ng/m^3)	NH ₃ ($\mu\text{g}/\text{m}^3$)	Pb ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	As (ng/m^3)	C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)	BaP (ng/m^3)	HC (ng/m^3)
Jaganathpur 10.06.2020	64.8	38.9	7.2	13.2	11.8	0.81	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bandhubaria 10.06.2020	69.2	41.5	7.8	12.4	12.1	0.92	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Raikara 13.06.2020	72.8	43.7	8.2	11.2	9.4	0.91	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part -23)-2099	USEPA CFR- 40,Part- 50, Appendix- L	IS: 5182 (Part-2)- 2001	IS: 5182 (Part-6)- 2006	IS: 5182 (Part-9)- 2074	IS 5182 : Part.10- 2099	Air Sampling, 3rd Edn. By James P. Lodge (Method- 401)	EPA 10- 3.2	EPA IO- 3.2	APHA 22nd- 3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	---

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NOx < 9 $\mu\text{g}/\text{m}^3$, O₃ < 9 $\mu\text{g}/\text{m}^3$, NH₃ < 20 $\mu\text{g}/\text{m}^3$, As < 0.001 ng/m^3 , Ni < 0.01 ng/m^3 , C₆H₆ < 0.001 $\mu\text{g}/\text{m}^3$, BaP < 0.002 ng/m^3 , Pb < 0.001 $\mu\text{g}/\text{m}^3$, CO < 0.1 mg/m^3 , HC < 0.001 $\mu\text{g}/\text{m}^3$





Ref: *Enviro/2019 R-1435*

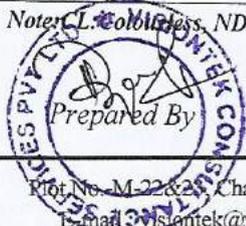
Date: *06/07/20*

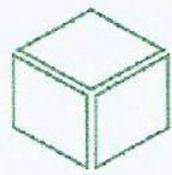
DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **DW-1: Near Canteen**
3. Date of sampling : **17.06.2020**
4. Date of analysis : **18.06.2020 to 24.06.2020**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Parameter	Testing Methods	Unit	Norms as per IS:10500-2012 Amended on 2015 & 2018	Analysis Results	
Microbiological Analysis						
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100 ml sample	<1.1	
2	Fecal Coliforms	APHA9221-E	MPN/100ml		<1.1	
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100 ml sample	Absent	
Chemical Analysis						
	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
1	Colour	APHA 2120 B ₁	Hazen	5	15	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	pH value at 25°C	APHA 4500H ⁺ B	NTU	6.5-8.5	No Relaxation	7.62
5	Turbidity	APHA 2130 B	--	1	5	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	500	2000	121
7	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	0.2	<0.001
8	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	1	<0.2
9	Boron (as B)	APHA 4500B ₁ , B ₂	mg/l	0.5	2.4	<0.01
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	200	54
11	Chloride (as Cl)	APHA 4500Cl ⁻ B	mg/l	250	1000	60
12	Copper (as Cu)	APHA 3111 B	mg/l	0.05	1.5	<0.05
13	Fluoride (as F ⁻)	APHA 4500F ⁻ D	mg/l	0.05	1.5	<0.01
14	Residual Free Chlorine	APHA 4500Cl ₂ B	mg/l	0.2	1	ND
15	Iron (as Fe)	APHA 3500Fe ₁ , B ₂	mg/l	1.0	No Relaxation	0.28
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	34
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.005
18	Mineral Oil	APHA 5220 B	mg/l	0.5	No Relaxation	<0.01
19	Nitrate (as NO ₃ ⁻)	APHA 4500 NO ₃ ⁻ E	mg/l	45	No Relaxation	4.2
20	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	0.002	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	No Relaxation	<0.001
22	Sulphate (as SO ₄ ²⁻)	APHA 4500 SO ₄ ²⁻ E	mg/l	200	400	5.6
23	Alkalinity (as CaCO ₃)	APHA 2320 B	mg/l	200	600	60
24	Total Hardness (as CaCO ₃)	APHA 2340 C	mg/l	200	600	70
25	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	No Relaxation	<0.001
26	Cyanide (as CN ⁻)	APHA 4500 CN ⁻ C,D	mg/l	0.05	No Relaxation	ND
27	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	No Relaxation	<0.01
28	Mercury (as Hg)	APHA 3500 Hg B	mg/l	0.001	No Relaxation	<0.001
29	Arsenic (as As)	APHA 3114 B	mg/l	0.01	0.05	<0.001
30	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	15	<0.05
31	Chromium (as Cr ⁶⁺)	APHA 3500Cr B	mg/l	--	--	<0.05
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	ug/l	0.0001	No Relaxation	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	--	No Relaxation	Absent

Note: *CL: Coliforms*, ND: Not Detected.





Ref.:

Envlab/20/R-1438

DAILY DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

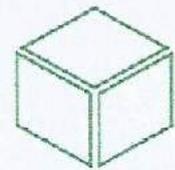
- Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
- Sampling location : DW-1: Water Treatment Plant
- Sample collected by : VCSPL Representative in presence of TATA Representative

Date: 08/07/20



Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012			6/1/2020	6/2/2020	6/3/2020	6/4/2020	6/5/2020	6/6/2020	6/7/2020	6/8/2020	6/9/2020	6/10/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	Permissible Limit No Relaxation	7.66	7.61	7.66	7.58	7.55	7.54	7.56	7.58	7.61	7.66	7.62
2	Turbidity in NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012			6/12/2020	6/13/2020	6/14/2020	6/15/2020	6/16/2020	6/17/2020	6/18/2020	6/19/2020	6/20/2020	6/21/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	0.2(Min.)	7.64	7.62	7.59	7.61	7.6	7.61	7.6	7.63	7.59	7.58	7.61
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012			6/23/2020	6/24/2020	6/25/2020	6/26/2020	6/27/2020	6/28/2020	6/29/2020	6/30/2020		
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	0.2(Min.)	7.62	7.63	7.64	7.66	7.69	7.7	7.71	7.72			
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1			
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND	ND	ND	ND	ND	ND	ND			





Ref.: *Envlab/20/R-1437*

Date: *08/07/20*

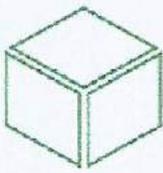
SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Kundra Nallah Entering H. Quarry
SW-2:Kundra Nallah Leaving H.Quarry**
3. Date of Analysis : **10.06.2020 TO 16.06.2020**
4. Sample collected by : **VC SPL Representative in presence of TATA Representative**

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class - 'C'	Analysis Results	
					09.06.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.4	6.8
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	<1.8	<1.8
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	180	110
4	pH Value	APHA 4500H* B	--	6.0-9.0	7.59	7.62
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	184	180
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.02	<0.05
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.46	0.48
9	Chloride (max)	APHA 4500Cl ⁻ B	mg/l	600	54	58
10	Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	6	6.4
11	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	4	4.8
12	Fluoride as F (max)	APHA 4500F ⁻ C	mg/l	1.5	0.021	0.026
13	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
14	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
15	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
16	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.004	<0.004
17	Cyanide as CN (max)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
18	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
19	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
20	Hexa Chromium as Cr ⁺⁺	APHA 3500Cr B	mg/l	0.05	<0.01	<0.01
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2

Note: ND: Not Detected.





Ref.: *Env/lab/20/R-1438*

Date: *06/07/20*

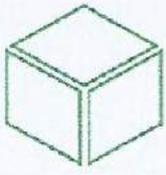
DOMESTIC EFFLUENT WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **STPW-1: STP-Inlet
STPW-2: STP-Outlet**
3. Date of Sampling : **17.06.2020**
4. Date of Analysis : **18.06.2020 to 24.06.2020**
5. Sample Collected By : **VCSPL Representative in presence of TATA Representative**

Sl. No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results	
					STPW-1	STPW-2
1	Colour & Odour	APHA 2120 B, C & APHA 2150 B	Hazen	Colourless/Odourless as far as practicable	<10 & pungent smell	<5 & U/O
2	Suspended Solids	APHA 2540 C	mg/l	100	92	44
3	Particulate size of SS	APHA 2540 C		Shall pass 850 micron IS Sieve	< 850	< 850
4	pH Value	APHA 4500H ⁺ B	--	5.5-9.0	6.89	7.21
5	Temperature	APHA 2550-B	°C	Shall not exceed 5°C above the receiving water temperature	28	28
6	Oil & Grease(max)	APHA 5520 B	mg/l	10	4.2	ND
7	Total Residual Chlorine	APHA 4500Cl, B	mg/l	1	ND	ND
8	Ammonical Nitrogen (as N)	APHA 4500-NH ₃ C	mg/l	50	8.8	2.4
9	Total Kjeldahl nitrogen (as NH ₃)	APHA 4500-N _{org} C	mg/l	100	14.2	8.1
10	Free ammonia (as NH ₃)	APHA 4500-NH ₃ F	mg/l	5	ND	ND
11	BOD(3 days at 27°C (max)	IS 3025 (P-44) 1993 RA 2003	mg/l	30	32.8	8
12	Chemical Oxygen Demand as COD	APHA 5220-C	mg/l	250	210	40
13	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
14	Mercury (Hg)	APHA 3500 Hg	mg/l	0.01	<0.001	<0.001
15	Lead as Pb(max)	APHA 3111 B, C	mg/l	0.1	<0.01	<0.01
16	Cadmium as Cd (max)	APHA 3111 B, C	mg/l	2	<0.001	<0.001
17	Hexavalent Chromium as Cr ⁺⁶	APHA 3500Cr B	mg/l	0.1	<0.05	<0.05
18	Total Chromium (Cr)	APHA3500-Cr, B	mg/l	2	<0.05	<0.05
19	Copper as Cu (max)	APHA 3111 B, C	mg/l	3	<0.05	<0.05
20	Zinc as Zn(max)	APHA 3111 B, C	mg/l	5	0.58	<0.05
21	Selenium (Se) (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
22	Nickel (Ni)	APHA 3500-Ni	mg/l	3	<0.001	<0.001
23	Cyanide as CN (max)	APHA 4500 CN- C,D	mg/l	0.2	ND	ND
24	Fluoride as F (max)	APHA 4500F- C	mg/l	2	0.44	0.028
25	Dissolved Phosphates (P)	APHA4500-P D	mg/l	5	0.061	<0.05
26	Sulphide (S)	APHA 4500-S ₂ -D	mg/l	2	< 0.1	< 0.1
27	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B, D	mg/l	1	<0.001	<0.001
28	Bio-assay test	APHA 8910-C		90% survival of fish after 96 hours in 100% effluent	90% survival of fishes	96% survival of fishes
29	Manganese (Mn)	APHA 3500-Mn, B	mg/l	2	0.048	<0.005
30	Iron as Fe (max)	APHA3500-Fe, B	mg/l	3	1.91	0.64
31	Vanadium (V)	APHA 3500-V	mg/l	0.2	<0.001	<0.001
32	Nitrate Nitrogen	APHA 4500-NO ₃ E	mg/l	10	6.4	2.1

Note : ND:Not Detected.





Ref.: *Emulab/20/R-1439*

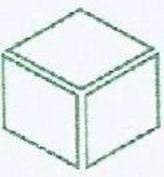
Date: *06/07/20*

AMBIENT NOISE MONITORING REPORT FOR JUNE 2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Monitored by : VCSPL Representative in presence of TATA Representative

Sl. No	Monitoring Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	21.06.2020	Town ship	dB (A)	68	75	52	70
2		Hospital		44	50	36	40
3		Mines Area		70	75	64	70





Ref.: Konlab/20/R-1440

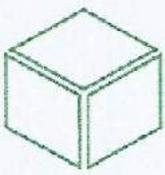
Date: 06/07/20

PERSONAL DUST SAMPLING ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
Sample collected by : VCSPL representative in presence of TATA representative.

Sl.No	Date of sampling	Name of the Person	Personal Number	Standard	Particulate matter as PM (mg/m ³)
1	22.06.2020	Ialatendu Lohar	TSP/798688/0919	5 mg/m ³	4.4
2		Santana Munda	TSP/753276/0819		4.3
3		Bigneswari Malakut	BMM-236		4.4
4		Johan Hembram	MW0719167159		4.5
5		Saraswati Tanti	MWO719166977		4.4
6		Shradhanjali Maharana	MWO719167124		4.8
7		Bhaina Hembram	MWO719166713		4.9
8		Parinda Munda	MWO719167743		4.1





Ref.: Konlab/201 R-1441

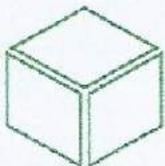
Date: 06/07/20

FUGITIVE EMISSION ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2.Sample Collected By : VCSPL Representative in presence of TATA Representative

	Sampling Location			Jun-20
L-1	Near Sorting Yard (Joribar Block)	Prescribed Standard	Monitoring Date	13.06.2020
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m ³)		731
L-2	Near Stack Yard(Joribar Block)	Prescribed Standard	Monitoring Date	13.06.2020
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m ³)		578
L-3	Near Haul Road (Joribar Block)	Prescribed Standard	Monitoring Date	14.06.2020
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m ³)		538





Ref.: Enulab/201R-1442

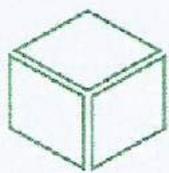
Date: 06/07/20

DG STACK REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Bamebari Manganese Mines (M/s TATA Steel Limited)
2. Sampling location : ST1: 100 KvA DG Set
3. Date of Analysis : 20.06.2020
4. Sample collected by : VCSPL Representative in presence of TATA Representative

SL.No	Parameters Analyzed	Unit	CPCB LIMIT	Result
1	Stack Temperature	$^{\circ}\text{C}$	132
2	Velocity	m/Sec	11.6
3	Concentration Of Particulate Matter As PM	mg/Nm^3	50	48
4	Oxides of Nitrogen as Nox	mg/Nm^3	400	70
5	Carbon Monoxide as CO	mg/Nm^3	150	71.4
6	Non Methyl Hydrocarbon as C	mg/Nm^3	8.1





Ref.: *Envr/ab/20/R-1443*

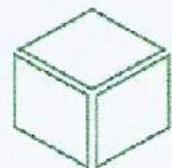
Date: *06/07/20*

DUSTFALL ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **DF1: Mines Area**
3. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Date of Sampling	Total Dust Fall (t/km ² /month)	Analysis Result			
		Co (%)	Ni(%)	Hg(%)	As (%)
01.06.2020 TO 30.06.2020	0.71	<0.001	<0.001	<0.001	<0.001





Ref.: *Envilab/20/R-1444*

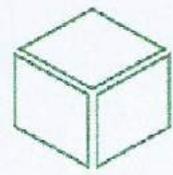
Date: *06/07/20*

SOIL ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **S1: Mines Area**
3. Sample collected by : **VC SPL Representative in presence of TATA Representative**

Date of Sampling	Co (%)	Ni(%)	Hg(%)	As (%)
20.06.2020	0.048	0.062	<0.000002	<0.000002





Ref: *Konlab/2019R-1442*

Date: *08/07/20*

OIL SEPARATION PIT REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **WW1: Workshop Water**
3. Date of Sampling : **19.06.2020**
4. Date of Analysis : **20.06.2020 to 26.06.2020**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl.	Parameters	Unit	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report June 2020
1	Colour	Hazen	5	CL
2	Odour	-	Unobjectionable	U/O
3	pH at 25 degree C	-	5.5-9.0	7.52
4	Total Dissolved Solids	mg/l	-	144
5	Copper as Cu	mg/l	3.0	<0.02
6	Fluoride as F	mg/l	2.0	0.041
7	Total Residual Chlorine	mg/l	1.0	ND
8	Iron as Fe	mg/l	3.0	0.68
9	Manganese as Mn	mg/l	2.0	1.54
10	Nitrate as NO ₃	mg/l	10.0	5.6
11	Phenolic Compounds as C ₆ H ₅ OH	mg/l	1.0	<0.05
12	Selenium as Se	mg/l	0.05	<0.001
13	Cadmium as Cd	mg/l	2.0	<0.001
14	Cyanide as CN	mg/l	0.2	ND
15	Lead as Pb	mg/l	0.1	<0.01
16	Mercury as Hg	mg/l	0.01	<0.001
17	Nickel as Ni	mg/l	3.0	<0.05
18	Arsenic as As	mg/l	0.2	<0.004
19	Total Chromium as Cr	mg/l	2.0	<0.05
20	Zinc as Zn	mg/l	5.0	<0.05
21	Hexavalent Chromium as Cr ⁺⁶	mg/l	0.1	<0.01
22	Vanadium as V	mg/l	0.2	<0.001
23	Total Suspended Solids	mg/l	100	66
24	Temperature	0C	shall not exceed 5 ^o C above the receiving water temperature	34
25	Dissolved Oxygen	mg/l	-	6.6
26	BOD at 27 ^o C for 3 days	mg/l	30	<1.8
27	COD	mg/l	250	40
28	Oil & Grease	mg/l	10	ND
29	Ammonical Nitrogen as N	mg/l	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	100	3.9
31	Sulphide as S	mg/l	2.0	ND
32	Free Ammonia as NH ₃	mg/l	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	90% survival in 100% effluent	98% survival in 96 HRS effluent
35	Dissolved Phosphates as PO ₄	mg/l	5.0	<0.05

Prepared By
[Signature]
VISIONTEK CONSULTANCY SERVICES LTD.

Verified By
[Signature]
VISIONTEK CONSULTANCY SERVICES LTD.