By-Email

Ref.No.: MGM/P&E/ 371 /2020 Date: 01/ 12/ 2020

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

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

Reference:
1) MoEF Letter Ref No: J-11015/87/2004-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-11015/87/2004-IA. II(M) DATED 17th Nov 2005** in respect of Tiringpahar Manganese Mine of M/s TATA Steel Ltd. for the period from April'20 to Sep'20 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-11015/87/2004-IA. II(M) DATED 17.11.2005)

Period: April'20 to September'20

Submitted By:

Tiringpahar Iron & Manganese Mine

M/s. Tata Steel Limited

At/Po:Guruda, Via-Joda

District- Keonjhar, Odisha -758034

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Compliance to the Environment Clearance Letter No: -11015/87/2004-IA. II(M) DATED 17.11.2005 in respect of Expansion of the Tiringpahar Manganese Mine of M/s Tata Steel Limited for the enhancement of production capacity from 0.43LTPA to 0.85 LTPA in villages Guruda, Plasha, Khondbond, Jaribahal, Tehsil Barbil, District-Keonjhar, Odisha.

Table. A. Specific Condition:

Sl. No	Specific Condition	Compliance Status (Oct'19 to March'20)
(i)	Mining shall not be undertaken in areas of forestland within the lease for which forestry clearance has not been obtained.	**Complied.** The mine has obtained forest clearance for 52.348 ha of forest land vide MoEF's letter No 8-80/2004-FC dt 28.03.2007. Forest diversion proposal over an area of 80.826 ha (Sabik forest + Balance forest) has been applied on 19.06.2016; which is under process. The mining operation and allied activities are confined within the approved diverted area only.
(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.	**Complied.** Topsoil generated during mining operation is concurrently used in the development and maintenance of the greenbelt activities.
(iii)	OB and other wastes should be stacked at earmarked sites only and should not be kept active for long periods of time. Plantation should be taken up for soil stabilisation 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.	**Complied.** Overburden dumping is ensured as per the mining plan approved by Indian Bureau of Mines (IBM). The dumps are terraced properly and slope is maintained well within 28^0. The dumps are stabilized by plantation of native varieties of forestry saplings such as Sal, Karanj, Neem, Mahaneem, Gambhari, Sisam, etc. The retaining wall and garland drain with sedimentation pit supported with toe wall along the periphery of the OB dump has been constructed to arrest the silt and sediments from surging into the natural stream along with the runoff.
(iv)	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, 0B 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	**Complied.** Existing catch drains and garland drains are covering the entire dump slope at low lying part. The catch drains and sedimentation pits are periodically de-silted and maintained properly. Garland drains along the periphery of the dumps have been constructed supported with retention wall/gabion wall to arrest the silt from the runoff.

Sl. No	Specific Condition	Compliance Status (Oct'19 to March'20)
	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.	
(v)	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.	**Complied.** To prevent the siltation and check the run-off, retaining wall and garland drain are provided with the dimension as follows: Dimension of the Retaining Wall : Height – 1 to 1.2 mtr. Width – 1 mtr. Dimension of the Garland Drain : 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.
(vi)	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.	**Complied.** Environmental monitoring was ensured till June'20.
(vii)	Mineral and OB transportation shall be in trucks/dumpers covered with tarpaulins. Vehicular emissions should be kept under control and regularly monitored. Suitable measures should be taken to check fugitive emissions from haulage roads & transfer points, etc.	**Complied.** All the trucks dispatching mineral from the mine lease are covered with tarpaulin. OB is being transported by shovel – dumper combination from mine face to dumps located near the quarry itself within 1.5 Km. Covering tarpaulins for OB within the mine boundary is not in practice considering the safety aspects on account especially due to frequent manual intervention during unloading. All the trucks are regulated by "Pollution under Control" certificate. Regular water sprinkling by mobile water sprinklers to suppress fugitive emission from haul roads and other potential area like OB dump and stack yard is ensured. Environmental monitoring was ensured till June'20.
(viii)	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 *I* Agriculture Department. The density of the trees should be not less than 2500 plants per ha.	**Complied.** During April'20 to Sep'20, around 1100 Nos of saplings of native forestry varieties and Vertiber slips have been planted for the slope stabilization. However, we shall ensure plantation of around 12000Nos by the end of Fy 2020-21.

Sl. No	Specific Condition	Compliance Status (Oct'19 to March'20)
(ix)	Groundwater shall not be used for mine operations. Prior approval of CGWA shall be obtained for using groundwater.	**Complied.** The ground water table has not been intersected so far thus no ground water is being used for mining operation.
(x)	Mining will not intersect groundwater. Prior permission of the MOEF and CGWA shall be taken to mine below water table.	**Complied.** Mining is not intersecting the ground water as the Ground water being at lower level in comparison to existing maximum quarry depth.
(xi)	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 Ministry of Environment & Forests and the Central Ground Water Authority quarterly.	**Complied.** Ground water table is much below the existing mine workings because of mining operations are confined at hilly topography only. Environmental monitoring was ensured till June'20.
(xii)	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.	**Complied.** Environmental monitoring was ensured till June'20.
(xiii)	"Consent to Operate" should be obtained from SPCB before expanding mining activities.	**Complied.** "Consent to operate" has been obtained from State Pollution Control Board, Orissa vide Order no.115 issued by letter no. 8915 / IND-I-CON-190 dated 29.08.2019 & it is valid up to 31.03.2021.
(xiv)	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 reported to	**Complied.** We have deposited Rs.25,20,385/- on 14.12.2005 vide SBI DD No -062994 being the contribution towards implementation of Wild Life Management Plan prepared for Bonai & Keonjhar division. Further, as per subsequent demand raised by the forest department, additional amount of Rs. 859615.00 on 27.03.2013 vide SBI DD No.657488 and Rs 38,87,000.00 through RTGS bearing UTR No. HDFCR52015073005436903 on dated 30.07.2015 towards differential payment for implementation of regional Wildlife Management Plan prepared for Bonai & Keonjhar division and the same has been intimated to the DFO, Keonjhar.

Sl. No	Specific Condition	Compliance Status (Oct'19 to March'20)
	the Ministry of Environment & forests, RO, Bhubaneshwar.	Further, Site Specific Wildlife Management Plan has been approved as per the new guidelines vide Memo No. 7724 /1 WL-SSP-94/2015 dated 03.08.2015. Further, we have deposited an amount of Rs. 2,40,47,000/- dated 09.03.2018 in respect of Tiringpahar Iron & Mn. Mine through NEFT mode towards SSWLCP in Odisha CAMPA vide Ref. No. SBINR5201803900004322.
(xv)	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.	**Complied.** The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests in advance of final mine closure for approval.

Table. B General Conditions

Sl. No	General Condition	Compliance Status (April'20 to Sep'20)
i.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	**Complied.** 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, Forest & Climate Change.
ii.	No change in the calendar plan including excavation, quantum of manganese ore and waste should be made.	**Complied.** Production and excavation volume is regulated vide Mine plan approved by Indian Bureau of Mines.
iii.	Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM. SPM, SO2, NOx. 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, SO2 & NOx.) should be regularly submitted to the Ministry including its Regional office at Bhubaneshwar and the State Pollution Control Board *I* Central Pollution Control Board once in	**Complied.** Environmental monitoring was ensured till June'20.

	six months.	
iv.	Drills should be wet operated or with dust extractors and controlled blasting should be practiced.	**Complied.** Wet drilling concept is already in place. Controlled blasting technique with NONEL is being practiced where ever required.
v.	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.	**Complied.** Effective water sprinkling by mobile water tanker is being done on haul roads. Environmental monitoring was ensured till June'20.
vi.	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, etc should be provided with ear plugs/ muffs.	**Complied.** Environmental monitoring was ensured till June'20.
vii.	In 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 19 th May, 1993 and 31 st December 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	**Complied.** No infrastructural facility has been installed for equipment/ vehicle within the lease hold area. The equipment and vehicles deployed in the mine are maintained at Bamebari Mn. Mines which is under same management control. The oil separation system has been provided at workshop at Bamebari and working effectively.
viii.	Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.	**Complied.** Environmental monitoring was ensured till June'20.
ix.	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.	**Complied.** Suitable dust masks are being provided to employees (departmental & contractual) engaged in dusty operations. It is also ensured that they use the same. Employees are undergoing Periodical Medical Examination which is inclusive of lungs function test and audiometry. All the personnel are trained on safety in work place and continuous awareness program are being conducted for all employees to avert manganese poisoning. Periodical Medical Examination of employees (departmental & contractual) are conducted as per prescribed norms of Mines Rule, 1955. The initial and periodical examination includes blood haematology, blood pressure, detailed cardiovascular assessment, neurological examination etc. All chest radiographs are being classified for detection of pneumoconiosis, diagnosis and documentation made in accordance to ILO classifications.

x.	A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the Organization.	**Complied.** A centralised environmental Management cell has been constituted and one environmental manager is deployed at site supported with the monitoring agency for the implementation of environmental management plan and reporting the progress to the chief Environment, who finally 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 Bhubaneshwar.	**Complied.** Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose and the fund allocated for environmental expenditure is earmarked with a specific cost centre maintained for the purpose.
xii.	The Regional Office of this Ministry located at Bhubaneshwar 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 *I* information/ monitoring reports.	**Complied.** We shall extend to full co-operation to the officers of the Regional Office by furnishing the requisite date/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.	**Complied.** Copy of the clearance letter marked to Sarpanch, Gram Panchayat, Jajang 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.	This is applicable to State Pollution Control Board, Orissa.
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.	**Complied.** A detail of Environmental Clearance with regard to Tiringpahar Manganese Mine was published in Oriya News Papers Anupam Bharat & Aam Khabar dated 10.01.2006.

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 (Apr'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.	The best scientific method of mining is in practice at Tiringpahar Iron and Manganese Mine. Garland grain and Retaining wall are provided at the toe of the overburden dumps. Settling ponds are done at intervals along the garland drain.
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 go down below the pre-mining period. In case of any water scarcity in the area, the project authorities have to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well.	Agreed. No water bodies disturbed due to mining activities. The ground water table is being monitored regularly from the open well and tube well of nearby villages.
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.	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.
iv.	The project Authority shall make necessary alternative arrangement, where required, in consultation with state Government to provide alternative 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.	Not Applicable. There is no grazing land within the Mine Lease (ML) area.

Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
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 building or inhabited sites except with prior permission from the competent Authority.	Deep hole drilling and controlled blasting technique has been adopted in the mine. Vibration study has been done with the help of CIMFR and vibration limit (ppv) found within the limit. Provision for monitoring each blast has been established to ascertain the blast induced vibration (ppv) limit at different distances from the centre of blasting.
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.	The main haulage road, mineral stacking area overburden dumping areas are regularly sprinkled with water by using water tankers and Fixed sprinklers.
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.	Not Applicable. There is no crop land nearby the M.L. area.
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.	Not Applicable
ix.	Transportation of minerals by road passing through the village shall not be allowed. A "bypass" road should be constructed (say leaving a gap of at least 200 m) for the purpose of transportation of minerals so that the impact of sound, dust and accidents could be mitigated. The PP shall bear the cost towards the widening and strengthening of existing public road network in case same is proposed to be used for the project. No road movement	There is no transportation road passing through any village.

Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
	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.	Not Applicable
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 plan, 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 programmes 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.	Tata Steel has taken up many social initiatives for the upliftment of the education, health and other socio-economic development of the neighbouring villages. TSRDS (Tata Steel Rural Development Society) has been pioneering the initiatives through CSR activities. R&R policy has not been applicable for the PP till now.

Agent & Head,
Manganese group of Mines **Date:**
Ferro Alloys Mineral Division
(Tiringpahar Iron & Mn.Mine)
M/s Tata Steel Limited

Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
	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. The PP shall bear the cost towards the widening and strengthening of existing public road 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	
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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 plan, 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 programmes 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.	Tata Steel has taken up many social initiatives for the upliftment of the education, health and other socio-economic development of the neighbouring villages. TSRDS (Tata Steel Rural Development Society) has been pioneering the initiatives through CSR activities. R&R policy has not been applicable for the PP till now.

Amit

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

Date: 01/12/2020

Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)

ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/094 Date**: 03.05.2020**

AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : **Tiringipahar 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:**Purunapani
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)	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)	Benzene (µg/m^3)	Benzo(a) pyrene (ng/m^3)	Mn (µg/m^3)
1	02.04.2020	65.2	39.12	8.8	14.8	7.8	0.42	24.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
2	06.04.2020	68.8	41.28	9.1	15.2	8.4	0.44	25.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
3	09.04.2020	68.2	40.92	9.4	15.6	8.2	0.42	24.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
4	13.04.2020	66.2	39.72	9.2	14.8	8.1	0.41	24.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
5	16.04.2020	65.6	39.36	9.6	14.6	7.8	0.44	25.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
6	20.04.2020	64.8	38.88	9.2	14.2	7.6	0.42	25.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
7	23.04.2020	65.2	39.12	9	15.6	7.2	0.41	24.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
8	27.04.2020	64.4	38.64	8.8	15.2	7.2	0.46	24.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
9	30.04.2020	66.1	39.66	9.2	14.8	8.1	0.44	25.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Average		**66.06**	**39.63**	**9.14**	**14.98**	**7.82**	**0.43**	**24.98**	**< 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 , 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: SO_2< 4 µg/m^3, NO_X< 9 µg/m^3, O_3<4 µg/m^3, NH3<20 µg/m^3, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 µg/m^3, BaP<0.002 ng/m^3, Pb<0.001 µg/m^3, CO-<0.1 mg/m^3, Mn<0.001 µg/m^3

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/095 Date**: 03.05.2020**

AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : **Tiringipahar 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:**Guruda Pit
4. Sample collected by : VCSPL representative in presence of TATA representative.

Sl. No.	Date of Monitoring	Concentration of Pollutants												
		PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	Benzene ($\mu g/m^3$)	Benzo(a) pyrene (ng/m^3)	Mn ($\mu g/m^3$)
1	**02.04.2020**	61.8	37.08	8.8	11.6	8.2	0.46	21.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
2	**06.04.2020**	62.8	37.68	8.4	12.2	8.2	0.41	20.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
3	**09.04.2020**	64.2	38.52	8.6	12.8	8.4	0.42	21.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
4	**13.04.2020**	64.8	38.88	8.2	12.4	9.1	0.44	21.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
5	**16.04.2020**	63.2	37.92	8.4	13.2	9.2	0.46	24.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
6	**20.04.2020**	62.8	37.68	7.8	13.6	9.6	0.51	23.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
7	**23.04.2020**	60.2	36.12	7.9	13.2	9.2	0.52	23.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
8	**27.04.2020**	60.8	36.48	8.2	13.1	8.8	0.48	21.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
9	**30.04.2020**	61.2	36.72	8.1	12.6	8.9	0.44	21.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	< 0.001
Average		**62.42**	**37.45**	**8.27**	**12.74**	**8.84**	**0.46**	**22.16**	**< 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 , 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: SO_2< 4 µg/m^3, NO_X< 9 µg/m^3, O_3<4 µg/m^3, NH3<20 µg/m^3, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 µg/m^3, BaP<0.002 ng/m^3, Pb<0.001 µg/m^3, CO-<0.1 mg/m^3, Mn<0.001 µg/m^3

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/096 Date**: 03.05.2020**

AAQ MONITORING REPORT FOR APRIL-2020 (BUFFER ZONE)

1. Name of Industry : **Tiringipahar 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} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	Benzene ($\mu g/m^3$)	Benzo(a) pyrene (ng/m^3)	HC ($\mu g/m^3$)
10.04.2020 BZ1: Joribahal	58	34.8	5.6	11.8	<4	0.69	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
10.04.2020 BZ2: Balada	62.8	37.68	6.8	11.2	<4	0.74	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
11.04.2020 BZ3: Palsa	64	38.4	6.1	10.2	11.4	0.64	<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 , 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: SO_2< 4 µg/m^3, NO_X< 9 µg/m^3, O_3<4 µg/m^3, NH3<20 µg/m^3, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 µg/m^3, BaP<0.002 ng/m^3, Pb<0.001 µg/m^3, CO-<0.1 mg/m^3,HC<0.001 µg/m^3

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/097 Date**: 03.05.2020**

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

1. Name of Industry : **Tiringipahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Kundra Nallah Entering Tiringpahar**
   SW-2:Kundra Nallah Leaving Tiringpahar
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**	6.2	6.8
2	BOD (3) days at 27^0C (max)	APHA 5210 B	mg/l	**3**	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/ 100 ml	**5000**	194	210
4	pH Value	APHA 4500H^+ B	--	**6.0-9.0**	7.56	7.62
5	Colour (max)	APHA 2120 B, C	Hazen	**300**	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	**1500**	146	158
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**	0.46	0.51
9	Chloride (max)	APHA 4500Cl^- B	mg/l	**600**	43.2	60.8
10	Sulphates (SO_4) (max)	APHA 4500 $SO4^{2-}$ E	mg/l	**400**	6.6	7.4
11	Nitrate as NO_3 (max)	APHA 4500 NO_3^- E	mg/l	**50**	4.4	4.6
12	Fluoride as F (max)	APHA 4500F^- C	mg/l	**1.5**	0.068	0.072
13	Phenolic Compounds as C_6H_5OH (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

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Ref: Envlab/20/098 Date**: 03.05.2020**

FUGITIVE DUST ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : **Tiringipahar 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 (Guruda Block)**	**Prescribed Standard**	**Monitoring Date**	**08.04.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		421
L-2	**Near Stack Yard (Guruda Block)**	**Prescribed Standard**	**Monitoring Date**	**08.04.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		412
L-3	**Near Haul Road (Guruda Block -Mine Pit)**	**Prescribed Standard**	**Monitoring Date**	**08.04.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		490
L-4	**Near Screening Plant**	**Prescribed Standard**	**Monitoring Date**	**08.04.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		602

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/099 Date**: 03.05.2020**

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **DW-1: Near Office**
3. Date of sampling : 20.04.2020
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
					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 25^0C	APHA 4500H^+ B	NTU	**6.5-8.5**	**No Relaxation**	7.58
5	Turbidity	APHA 2130 B	--	**1**	**5**	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	**500**	**2000**	116
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**	56
11	Chloride (as Cl)	APHA 4500Cl^- B	mg/l	**250**	**1000**	51.4
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**	0.42
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	**30**	**100**	36
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	**0.1**	**0.3**	<0.05
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**	0.71
20	Phenolic Compounds (as C_6H_5OH)	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)	APHA 4500 SO42- E	mg/l	**200**	**400**	3.6
23	Alkalinity (as $CaCO_3$)	APHA 2320 B	mg/l	**200**	**600**	74
24	Total Hardness(as $CaCO_3$)	APHA 2340 C	mg/l	**200**	**600**	81.2
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

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Ref: Envlab/20/100 Date**: 03.05.2020**

AMBIENT NOISE MONITORING REPORT FOR APRIL-2020

1. Name of Industry : **Tiringpahar 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 Result	Standard As per CPCB	Night time Equivalent Result	Standard As per CPCB
1	**27.04.2020**	Town ship	**dB (A)**	68	**75**	54	**70**

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Verified by

Ref: Envlab/20/101 Date**: 03.05.2020**

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

Name of Industry : **Tiringipahar 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**	Sudhir Kumar Karun	TSP/809982/0919	5 mg/m^3	4.6
2		Naresh Singh	TSP/751501/0819		4.4
3		Krushna Lohar	TSP/811500/0919		4.1
4		Tamina Bai	MWO719164188		4.2
5		Cham Munda	MW1216072525		4
6		Silibanti Munda	MWO719164349		4.2
7		Amit Dungdung	MO0719164536		4.4
8		Jenaram Pingua	MW1216072560		4.5

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/102 Date**: 03.05.2020**

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **GW-1: Palsa Village OW**
   GW-2: Sandhya Guta BW
3. Date of sampling : 09.04.2020
4. Date of analysis : 10.04.2020 TO 16.04.2020
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**	1.32	1.66
5	pH Value	APHA 4500H+ B	--	**6.5-8.5**	7.52	7.64
6	Total Hardness (as $CaCO_3$)	APHA 2540 C	mg/l	**300**	110.0	112.0
7	Iron (as Fe)	APHA 3500Al B	mg/l	**0.3**	0.26	0.22
8	Chloride (as Cl)	APHA 5540 C	mg/l	**250**	52.0	48.0
9	Residual, free Chlorine	APHA 4500B, B	mg/l	**0.2**	ND	ND
10	Dissolved Solids	APHA 3500Ca B	mg/l	**500**	148.0	151.0
11	Calcium (as Ca)	APHA 4500Cl- B	mg/l	**75**	40.0	42.8
12	Magnesium (as Mg)	APHA 3111 B,C	mg/l	**30**	16.8	18.0
13	Copper (as Cu)	APHA 4500F- C	mg/l	**0.05**	<0.05	<0.05
14	Manganese (as Mn)	APHA 4500Cl, B	mg/l	**0.1**	0.032	0.041
15	Sulphate (as SO_4)	APHA 3500Fe, B	mg/l	**200**	4.8	4.4
16	Nitrate (as NO_3)	APHA 3500Mg B	mg/l	**45**	0.28	0.22
17	Fluoride (as F)	APHA 3500Mn B	mg/l	**1**	0.018	0.022
18	Phenolic Compounds (as C_6H_5OH)	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**	1.26	1.32
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		<0.05	<0.05
28	Mineral Oil	APHA 3500 Hg	mg/l	**0.01**	<0.01	<0.01
29	Alkalinity	APHA 3114 B	mg/l	**200**	126.0	138.0
30	Aluminium as(Al)	APHA 3111 B,C	mg/l	**0.03**	<0.01	<0.01
31	Boron (as B)	APHA 3500Cr B	mg/l	**0.5**	<0.5	<0.5
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

Prepared by

Verified by

Ref: Envlab/20/103 Date**: 03.05.2020**

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **GWL-1: Palsa Village OW**
   GWL-2: Sandhya Guta BW
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	Palsa Village OW	9.3
2	Sandhy Guta BW	10.2

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Envlab/20/104 Date**: 03.05.2020**

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Date of sampling : 09.04.2020
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 Sandhya Guta	GW-2: Palsa Village O/W
1	Iron (as Fe)	APHA 3500Fe, B	mg/l	**1**	0.22	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**	0.032	0.032
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**	<0.05	<0.05

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Ref: Envlab/20/R-0505

Date: 01/06/2020

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

1. Name of Industry : **Tiringpahar 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: Purunapani**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS												
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)	Mn $\mu g/m^3$)
04.05.2020	70.2	42.1	9.6	14.8	9.1	0.46	23.8	BDL	BDL	BDL	BDL	BDL	BDL
07.05.2020	71.4	43.1	9.8	14.6	8.6	0.44	24.4	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2020	71.6	43.2	10.2	15.2	8.8	0.41	25.2	BDL	BDL	BDL	BDL	BDL	BDL
14.05.2020	68.8	41.4	10.6	15.4	8.9	0.46	25.8	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2020	68.2	41.1	11.2	15.6	9.2	0.44	26.2	BDL	BDL	BDL	BDL	BDL	BDL
21.05.2020	66.8	40.1	11.4	16.2	8.4	0.42	26.8	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2020	70.4	42.2	10.8	16.8	8.8	0.41	27.2	BDL	BDL	BDL	BDL	BDL	BDL
28.05.2020	70.8	42.6	10.2	17.2	8.4	0.42	27.8	BDL	BDL	BDL	BDL	BDL	BDL
Average	**69.8**	**42.0**	**10.5**	**15.7**	**8.8**	**0.4**	**25.9**	**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 : SO_2< 4 $\mu g/m^3$, NO_X< 9 $\mu g/m^3$, O_3<4 $\mu g/m^3$, NH_3<20 $\mu g/m^3$, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 $\mu g/m^3$, BaP<0.002 ng/m^3, Pb<0.001 $\mu g/m^3$, CO-<0.1 mg/m^3, Mn<0.001 $\mu g/m^3$

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Ref: EnvLab/20/R-0506

Date: 01/06/2020

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

1. Name of Industry : **Tiringpahar 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: Guruda Pit**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS												
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)	Mn $\mu g/m^3$)
04.05.2020	63.4	38.8	9.6	12.2	9.2	0.39	22.8	BDL	BDL	BDL	BDL	BDL	BDL
07.05.2020	63.6	38.2	9.8	12.8	9.6	0.44	22.6	BDL	BDL	BDL	BDL	BDL	BDL
11.05.2020	63.4	38.4	10.2	13.2	9.8	0.46	23.8	BDL	BDL	BDL	BDL	BDL	BDL
14.05.2020	64.2	37.8	10.6	13.4	10.2	0.48	24.2	BDL	BDL	BDL	BDL	BDL	BDL
18.05.2020	64.8	39.2	11.4	13.6	10.4	0.51	24.6	BDL	BDL	BDL	BDL	BDL	BDL
21.05.2020	65.8	39.4	11.8	12.8	10.8	0.44	25.2	BDL	BDL	BDL	BDL	BDL	BDL
25.05.2020	67.4	40.6	12.1	12.6	11.2	0.42	25.8	BDL	BDL	BDL	BDL	BDL	BDL
28.05.2020	68.8	41.4	11.6	12.4	10.8	0.44	26.6	BDL	BDL	BDL	BDL	BDL	BDL
Averages	**65.2**	**39.2**	**10.9**	**12.9**	**10.3**	**0.4**	**24.5**	**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: SO_2< 4 $\mu g/m^3$, NO_X< 9 $\mu g/m^3$, O_3<4 $\mu g/m^3$, NH3<20 $\mu g/m^3$, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 $\mu g/m^3$, BaP<0.002 ng/m^3, Pb<0.001 $\mu g/m^3$, CO-<0.1 mg/m^3, Mn<0.001 $\mu g/m^3$

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Ref: ENVLab/20/R-0507

Date: 01/06/2020

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

1. Name of Industry : **Tiringipahar 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} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)	HC (ng/m^3)
Joribahal 20.05.2020	61.2	36.8	5.8	12.2	<4	0.74	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Balada 20.05.2020	66.8	40.1	7.4	11.6	<4	0.78	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Palsa 22.05.2020	68.8	41.4	6.8	10.6	12.2	0.68	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: SO_2< 4 $\mu g/m^3$, NO_X< 9 $\mu g/m^3$, O_3<4 $\mu g/m^3$, NH3<20 $\mu g/m^3$, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 $\mu g/m^3$, BaP<0.002 ng/m^3, Pb<0.001 $\mu g/m^3$, CO-<0.1 mg/m^3, HC<0.001 $\mu g/m^3$

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Ref: EnvLab/20/R-0508

Date: 01/06/2020

FUGITIVE EMISSION REPORT FOR THE MONTH OF MAY-2020

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

	Sampling Location			May-20
L-1	**Near Sorting Yard (Guruda Block)**	**Prescribed Standard**	**Monitoring Date**	**22.05.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		432.6
L-2	**Near Stack Yard (Guruda Block)**	**Prescribed Standard**	**Monitoring Date**	**22.05.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		421.2
L-3	**Near Haul Road (Guruda Block -Mine Pit)**	**Prescribed Standard**	**Monitoring Date**	**22.05.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		508.2
L-4	**Near Screening Plant**	**Prescribed Standard**	**Monitoring Date**	**16.05.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(µg/m³)		631.8

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OHSAS 45001: 2018

Ref: EnvLab/20/R-0509 *Date:* 01/06/2020

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **DW-1: Near Office**
3. Date of sampling : 12.05.2020
4. Date of analysis : 13.05.2020 TO 18.05.2020
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 DW-1
Microbiological Analysis					
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	**Shall not be detectable in any 100ml sample**	<1.1
2	Fecal Coli forms	APHA9221-E	MPN/100ml		<1.1
3	E. Coli	APHA9221-F	MPN/100ml	**Shall not be detectable in any 100ml sample**	Absent

Chemical Analysis

Sl. No	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results DW-1
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 250C	APHA 4500H$^+$ B	NTU	**6.5-8.5**	**No Relaxation**	7.64
5	Turbidity	APHA 2130 B	--	**1**	**5**	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	**500**	**2000**	124
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**	62
11	Chloride (as Cl)	APHA 4500Cl$^-$ B	mg/l	**250**	**1000**	53.2
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**	0.48
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	**30**	**100**	39.6
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	**0.1**	**0.3**	<0.05
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**	0.78
20	Phenolic Compounds (as C_6H_5OH)	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)	APHA 4500 SO42- E	mg/l	**200**	**400**	3.8
23	Alkalinity (as $CaCO_3$)	APHA 2320 B	mg/l	**200**	**600**	86
24	Total Hardness(as $CaCO_3$)	APHA 2340 C	mg/l	**200**	**600**	90.4
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

Note:CL:Colourless, ND: Not Detected

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Plot No.-M-22&23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel.: 7752017905
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Ref: EnvLab/20/R-0510 *Date:* 01/06/2020

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Kundra Nallah entering Tiringpahar**
   SW-2:Kundra Nallah leaving Tiringpahar
3. Date of Analysis : 18.05.2020 TO 22.05.2020
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 17.05.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.6	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	150	160
4	pH Value	APHA 4500H^+ B	--	6.0-9.0	7.66	7.66
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	194	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	0.34	0.42
9	Chloride (max)	APHA 4500Cl^- B	mg/l	600	64	72
10	Sulphates (SO_4) (max)	APHA 4500 $SO4^{2-}$ E	mg/l	400	4.8	5.4
11	Nitrate as NO_3 (max)	APHA 4500 NO_3^- E	mg/l	50	3.8	4.2
12	Fluoride as F (max)	APHA 4500F^- C	mg/l	1.5	0.031	0.036
13	Phenolic Compounds as C_6H_5OH (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.

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Ref: EnvLab/20/R-0511 *Date:* 01/06/2020

NOISE MONITORING REPORT FOR MAY-2020

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Date of Recording : 30.05.2020
3. Monitored by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Date	Name of Location	Unit	Day time Equivalent Result	Standard As per CPCB	Night time Equivalent Result	Standard As per CPCB
1	**30.05.2020**	Township	**dB**	66.0	**75**	52.0	**70**

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ISO 14001: 2015
OHSAS 45001: 2018

Ref: Env Lab/20/ R-0512 *Date:* 01/06/2020

PERSONAL DUST SAMPLING ANLYSIS REPORT FOR THE MONTH OF MAY-2020

Name of Industry : **Tiringpahar 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	26.02.2020	Laxmi Munda	TSP/775944/0819	5 mg/m^3	4.3
2		Jema Patra	TSP/775945/0819		4.4
3		Rajesh Patra	TSP/785783/0819		4.6
4		Sitara Hessa	TSP/770136/0819		4.8
5		Ajay Das	TSP/770126/0819		4.6
6		Sarjen Kulei	TSP/770178/0819		4.4
7		Suresh Naik	TSP/801522/0919		4.2
8		Kumari Patra	TSP/801276/0919		4.1

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Ref.: Envlab/20/R-1448 Date: 08/07/20

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

1. Name of Industry : **Tiringpahar 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: Purunapani**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS												
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)	Mn $\mu g/m^3$)
01.06.2020	70.2	42.1	8.9	14.8	8.8	0.46	24.4	BDL	BDL	BDL	BDL	BDL	BDL
04.06.2020	70.8	42.5	8.8	14.4	8.4	0.44	24.2	BDL	BDL	BDL	BDL	BDL	BDL
08.06.2020	68.8	41.3	9.1	15.2	8.2	0.45	23.8	BDL	BDL	BDL	BDL	BDL	BDL
11.06.2020	66.6	40.0	9.2	15.6	8.1	0.48	23.4	BDL	BDL	BDL	BDL	BDL	BDL
15.06.2020	64.8	38.9	9.4	15.4	7.8	0.51	22.8	BDL	BDL	BDL	BDL	BDL	BDL
18.06.2020	65.6	39.4	9.2	15.6	7.4	0.52	22.9	BDL	BDL	BDL	BDL	BDL	BDL
22.06.2020	65.2	39.1	9.1	16.2	8.1	0.48	23.2	BDL	BDL	BDL	BDL	BDL	BDL
Average	**67.43**	**40.5**	**9.10**	**15.31**	**8.11**	**0.48**	**23.53**	**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 : SO_2< 4 $\mu g/m^3$, NO_X< 9 $\mu g/m^3$, O_3<4 $\mu g/m^3$, NH_3<20 $\mu g/m^3$, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 $\mu g/m^3$, BaP<0.002 ng/m^3, Pb<0.001 $\mu g/m^3$, CO-<0.1 mg/m^3, Mn<0.001 $\mu g/m^3$

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Ref.: Envlab/20/R-1447

Date: 06/07/20

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

1. Name of Industry : **Tiringpahar 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: Guruda Pit**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS												
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)	Mn $\mu g/m^3$)
01.06.2020	63.8	38.3	8.9	12.6	8.1	0.46	21.6	BDL	BDL	BDL	BDL	BDL	BDL
04.06.2020	64.4	38.6	9.2	12.8	8.4	0.48	22.8	BDL	BDL	BDL	BDL	BDL	BDL
08.06.2020	66.2	39.7	9.4	13.2	8.2	0.52	23.4	BDL	BDL	BDL	BDL	BDL	BDL
11.06.2020	66.8	40.1	9.6	13.8	8.8	0.55	23.8	BDL	BDL	BDL	BDL	BDL	BDL
15.06.2020	67.4	40.4	9.2	14.4	8.9	0.56	24.2	BDL	BDL	BDL	BDL	BDL	BDL
18.06.2020	67.8	40.7	8.9	14.8	9.1	0.62	23.6	BDL	BDL	BDL	BDL	BDL	BDL
22.06.2020	69.2	41.5	8.8	15.1	9.4	0.66	23.8	BDL	BDL	BDL	BDL	BDL	BDL
Averages	**66.51**	**39.9**	**9.14**	**13.81**	**8.70**	**0.55**	**23.31**	**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: SO_2< 4 $\mu g/m^3$, NO_X< 9 $\mu g/m^3$, O_3<4 $\mu g/m^3$, NH3<20 $\mu g/m^3$, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 $\mu g/m^3$, BaP<0.002 ng/m^3, Pb<0.001 $\mu g/m^3$, CO-<0.1 mg/m^3, Mn<0.001 $\mu g/m^3$

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Plot No.-M-22&23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel.: 7752017905
E-mail : visiontek@vcspl.org, visiontekin@gmail.com, visiontekin@yahoo.co.in, Visit us at: www.vcspl.org

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Ref.: Envlab/20/R-1448

Date: 06/07/20

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

1. Name of Industry : **Tiringipahar 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} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)	HC (ng/m^3)
Joribahal 03.06.2020	64	38.4	6.2	12.1	<4	0.71	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Balada 03.06.2020	63.4	38.04	7.2	11.8	<4	0.81	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Palsa 03.06.2020	**66**	**39.6**	**6.6**	**10.8**	**12.1**	**0.69**	**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 2Znd-3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	--

BDL Values: SO_2< 4 $\mu g/m^3$, NO_X< 9 $\mu g/m^3$, O_3<4 $\mu g/m^3$, NH3<20 $\mu g/m^3$, Ni<0.01 ng/m^3, As < 0.001 ng/m^3, C_6H_6<0.001 $\mu g/m^3$, BaP<0.002 ng/m^3, Pb<0.001 $\mu g/m^3$, CO-<0.1 mg/m^3, HC<0.001 $\mu g/m^3$

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Plot No.-M-22&23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel.: 7752017905 ,
E-mail : visiontek@vcspl.org, visiontekin@gmail.com, visiontekin@yahoo.co.in, Visit us at: www.vcspl.org

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Ref.: Ror/lab/20/R-1449

Date: 06/07/20

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **DW-1: Near Office**
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. No	Parameter	Testing Methods	Unit	Norms as per IS: 10500-2012 Amended on 2015 & 2018	Analysis Results
					DW-1
Microbiological Analysis					
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100ml sample	<1.1
2	Fecal Coli forms	APHA9221-E	MPN/100ml		<1.1
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100ml sample	Absent

Chemical Analysis						
Sl. No	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
						DW-1
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 250C	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	124
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	62
11	Chloride (as Cl)	APHA 4500Cl$^-$B	mg/l	250	1000	58
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	0.41
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	41
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.05
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	0.66
20	Phenolic Compounds (as C_6H_5OH)	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)	APHA 4500 SO42- E	mg/l	200	400	4.2
23	Alkalinity (as $CaCO_3$)	APHA 2320 B	mg/l	200	600	68
24	Total Hardness(as $CaCO_3$)	APHA 2340 C	mg/l	200	600	78
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

Note: CL- Colourless, ND- Not Detected

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Ref.: Envlab/20/R-1450 Date: 06/07/20

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

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Kundra Nallah entering Tiringpahar**
   SW-2:Kundra Nallah leaving Tiringpahar
3. Date of Analysis : 10.06.2020 TO 16.06.2020
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	
					09.06.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.1	6.9
2	BOD (3) days at 27^{0}C (max)	APHA 5210 B	mg/l	3	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/ 100 ml	5000	160	210
4	pH Value	APHA 4500H^+ B	--	6.0-9.0	7.59	7.71
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	192	220
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	0.38	0.44
9	Chloride (max)	APHA 4500Cl^- B	mg/l	600	70	74
10	Sulphates (SO_4) (max)	APHA 4500 $SO4^{2-}$ E	mg/l	400	5	5.8
11	Nitrate as NO_3 (max)	APHA 4500 NO_3^- E	mg/l	50	4	4.6
12	Fluoride as F (max)	APHA 4500F^- C	mg/l	1.5	0.03	0.036
13	Phenolic Compounds as C_6H_5OH (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.

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Ref.: Envlab/20/R-1451 Date: 06/07/20

NOISE MONITORING REPORT FOR JUNE-2020

1. Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
2. Date of Recording : 19.06.2020
3. Monitored by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Date	Name of Location	Unit	Day time Equivalent Result	Standard As per CPCB	Night time Equivalent Result	Standard As per CPCB
1	**19.06.2020**	Township	**dB**	71	**75**	62	**70**

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Ref.: Envlab/20/R-1452 Date: 06/07/20

PERSONAL DUST SAMPLING ANLYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : **Tiringpahar 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	16.06.2020	Suresh Naik	TSP/801522/0919	5 mg/m^3	4.3
2		Kumari Patra	TSP/801276/0919		4.4
3		Laxmi Munda	TSP/775944/0819		4.5
4		Jema Patra	TSP/775945/0819		4.6
5		Rajesh Patra	TSP/785783/0819		4.1
6		Sitara Hessa	TSP/770136/0819		4.8
7		Ajay Das	TSP/770126/0819		4.6
8		Sarjen Kulei	TSP/770178/0819		4.7

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Ref.: Envlab/20/R-1453 Date: 06/07/20

STACK ANLYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : **Tiringpahar Manganese Mines (M/s TATA Steel Limited)**
Monitoring Instruments : **ST1**: 15 KvA Purnapani DG set
Sample collected by : VCSPL representative in presence of TATA representative.

SL.No	Parameters Analyzed	Unit	CPCB LIMIT	Result 20.06.2020
1	Stack Temperature	^0C	.....	140
2	Velocity	m/Sec	.....	16.1
3	Concentration Of Particulate Matter As PM	mg/Nm^3	**50**	42
4	Oxides of Nitrogen as Nox	mg/Nm^3	**400**	74
5	Carbon Monoxide as CO	mg/Nm^3	**150**	36
6	Non Methyl Hydrocarbon as C	mg/Nm^3	....	7.2

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Ref.: Ecwfab/20/R-1454

Date: 06/07/20

SOIL ANLYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : **Bamebari Manganese Mines (M/s TATA Steel Limited)**
Monitoring Location : **S1**: Mines Area
Sample collected by : VCSPL representative in presence of TATA representative.

Sl No.	Parameters	Unit	Analysis Results 19.06.2020
			S1
1	Cobalt as Co	%	0.049
2	Nickel as Ni	%	0.062
3	Mercury as Hg	%	<0.000002
4	Arsenic as As	%	<0.000002

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Ref.: Kanlab/20/R-1455 Date: 06/07/20

DUST FALLANLYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : **Tiringipahar Manganese Mines (M/s TATA Steel Limited)**
Monitoring Location : S1: Mines Area
Sample collected by : VCSPL representative in presence of TATA representative.

Date of Sampling	Total Dust Fall (t/km2/month)	Analysis Result			
		Co (%)	Ni(%)	Hg(%)	As (%)
01.12.2019 TO 31.12.2019	0.6	<0.001	<0.001	<0.001	<0.001

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Ref.: EnvLab/20/R-1456 Date: 06/07/20

FUGITIVE EMISSION ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Tiringipahar 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 (Guruda Block)**	**Prescribed Standard**	**Monitoring Date**	**20.06.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(mg/m³)		448
L-2	**Near Stack Yard (Guruda Block)**	**Prescribed Standard**	**Monitoring Date**	**20.06.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(mg/m³)		432
L-3	**Near Haul Road (Guruda Block -Mine Pit)**	**Prescribed Standard**	**Monitoring Date**	**21.06.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(mg/m³)		510

L-4	**Near Screening Plant**	**Prescribed Standard**	**Monitoring Date**	**21.06.2020**
Parameters	**Method of Measurement**			
SPM	Gravimetric method	1200(mg/m³)		588

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