To,
The Additional Director
Ministry of Environment and Forests
Eastern Regional Office,
A/3, Chandrasekharpur
Bhubaneswar- 751023

Ref No: MGM/P&E/992 /2018
Date: 28.05.2018

Sub: **Submission of Six monthly compliance report on implementation of environmental safeguards of Malda Manganese Mine for the period from October' 17 to March'18.**

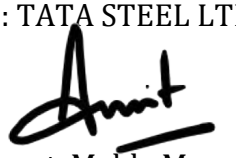
Dear Sir,

We are herewith submitting the six-monthly compliance report in respect of the stipulated environmental clearance conditions of Malda Manganese Mine for the period from October' 17 to March'18 as per EIA Notification, 2006.

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

Thanking you,

Yours faithfully
F: TATA STEEL LTD.



Agent, Malda Manganese Mine &
Head (Manganese Group of Mines), Joda

CC: Zonal Office Kolkata, Central Pollution Control Board

Encl: As above

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

COMPLIANCE REPORT PERIOD : October 17 to March 18

ENVIRONMENTAL CLEARANCE TO MALDA MANGANESE MINE OF TATA STEEL LIMITED VIDE MoEF's LETTER NO. J-11015/103/2006-1A.II(M) DATED 13.04.2007 COMPLIANCES SUBMITTED TO THE MINISTRY OF ENVIRONMENT & FORESTS, GOVERNMENT OF INDIA

Present Status of the Project:-

The Scheme of Mining and Progressive Mine Closure Plan for Malda Manganese Mine over an area of 822 ha was submitted under Rule No.12, MCDR 1988 for the period 2015-16 to 2019-20 and was approved by IBM vide letter no. MS/OTFM/33-ORI/BHU/2014-15 dated 06.04.2015.

Sl. No	A : Specific conditions	Compliance status
(i)	The Env. Clearance is subject to grant of forest clearance. The project proponent shall obtain necessary forestry clearance under the forest (Conservation)act ,1980 for the diversion of 239.408 ha forest land before starting mining operation in that area.	4th renewal forest diversion proposal was submitted on 17.07.2008 over an area of 555.066 ha. It was scrutinized by CCF, Nodal, O/o PCCF, Orissa. CCF, Nodal asked to comply the deficiencies vide Letter. no.30/9F(MG)-58/2008, dt.02.01.2009. In response, we have re-submitted the 3rd forest diversion proposal over an area of 541.425 ha and subsequently allotted with State Sl.No.327/09, dt.08.07.2009. We have submitted 4th renewal forest diversion proposal on 06.08.2009 over an area of 541.425 ha. as per clause no. 4.17 of the Guidelines and clarification issued by MoEF under FC Act & Rules. Stage I clearance over an area of 77.241 ha has been granted by MoEF vide letter no. F.NO .8-37/1996-FC dated 21st June 2012. We have also submitted compliance of stage I to DFO, Bonai vide our letter no. MMM/F-68/37/14 dated 26.12.2014. Mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05.2014.
(ii)	Mining will not intersect groundwater. Prior permission of the MOEF and CGWA shall be taken to mine below water table.	Mining is not intersecting the ground water as the Ground water being at lower level in comparison to existing maximum quarry depth.

(iii)	The project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operations.	As per field observation, Sona River passes 715m to west from Block - I, 158m to west from Block-II and 818m east from Block - III. Similarly, a small perennial nallah passes 258m east from Block - V. There are no natural water courses that are passing within or near to the safety zone of the present mine workings.
(iv)	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.	No Topsoil has been generated during the 2017-18. The top soil generated prior to this period has already been used for plantation in the inactive dump slopes and within lease.
(v)	The OB shall be stacked at earmarked dump sites only and should not be kept active for long periods of time. The Maximum height of the dump should not exceed 30 mtrs having 3 terraces of 10 mtrs. each. The overall slope angle shall not exceed 27°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion & surface run-off. In critical areas , use of Geo textiles shall be undertaken for the stabilization of the dump .Monitoring & management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the MoEF & its regional office located at Bhubaneswar on six monthly basis.	Mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05.2014. The inactive portion of OB dumps area being stabilized by plantation of local species. During the year 2017-18, we have planted 10,200 nos. of tree sapling of local species (Gambhari, Chakunda, Mahanimba, Kala Sirs, Sisu etc) in passive dumps. The overall slope angles of OB dumps are maintained within the natural angle of repose of the waste. As such, there are no presences of critical areas at OB dumps, so conventional plantation is being done for stabilization of dumps. The retaining wall and garland drain with sedimentation pit at corners near toe of OB dump. Their dimensions are matching the requirements to arrest effectively the run off.
(vi)	The void left unfilled in an area of 110.045ha shall be converted into water body. The higher benches of excavated void/mining pit shall be terraced and plantation done to stabilize the slopes. The slope of higher benches shall be made gentler for easy accessibility by local people to use the water body. Peripheral fencing shall be carried out along the excavated area.	The proposal for confirmatory exploration has been planned over the broken up area of 77.241 Ha to ensure the area is entirely barren. In case of occurrence of any ore body, the same shall be excavated prior to the reclamation and rehabilitation of the area. Stage –I approval under FC Act, 1980 has been granted over the 77.241 Ha area to carry out the above mentioned activities. Further proposal for development of the water body as a reclamation measure shall be taken up after the completion of the above

		mentioned planned activities.
(vii)	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working, soil, OB dumps and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly. Garland drain (size, gradient and length) shall be constructed for both mine pit and OB dumps and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.	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. Size, gradient and length of the drains will be adequate to take care of the peak flow.
(viii)	Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.	In order to prevent the siltation and to check the run-off it is proposed that toe walls and garland drains are being provided. <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.
(ix)	Plantation shall be raised in an area of 396.62 ha including a green belt of adequate width by planting the native species around ML area, OB dumps, roads, etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 2000 plants per ha.	Plantation programme have been drawn regularly in consultation with the local DFO and OSPCB. We have planted 3,27,649 nos. of saplings of local species over an area of 95.02 ha in passive dump and as avenue plantation till 2017-18. During the year 2017-18, we have planted around 10,200 nos. of forest variety saplings over an area of 0.6 ha. Tree density is maintained at the rate of approximately 2800 saplings per ha. by considering the rate of survival.

(x)	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	Mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05.2014. Mining is not intersecting the ground water as the Ground water being at lower level in comparison to existing maximum quarry depth, Whenever the ground water will have encountered in course of mining activity, there shall be earmarked area available for implementing the conservation measures to augment the ground water resources in consultation with the Regional Director, Central Ground Water Board.
(xi)	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year - pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MoEF and its regional office, CGWA and Regional Director, CGWB.	Presently, there is discontinuation of development of the mine and dispatch of ore since 27th Feb'2011 due to want of Forest Clearance. However, ground water level, ground water quality and trace metals in ground water at lower elevations is being monitored at existing tube well and open well. The monitoring results are enclosed as **Annexure I, II, III** respectively. Similarly, surface water quality is being monitored on monthly basis and abstract of the same is enclosed as **Annexure – IV**.
(xii)	Appropriate mitigative measures should be taken to prevent pollution of Suna river in consultation with the State Pollution Control Board.	Toe Wall and garland drains have been provided along the waste dump to prevent the pollution of Sona river due to direct flow of wash-off.
(xiii)	Permission from the competent authority should be obtained for drawl of water from Suna river and also ground water, if any, required for the project.	Application for allocation of water is in process and pending with water allocation committee. Water drawl charge is being paid regularly as per demand of irrigation department. The ground water is not being used for mining and its allied activities. Presently, there is discontinuation of development of the mine and dispatch of ore since 27th Feb'2011 due to want of Forest Clearance.
(xiv)	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in	Rainwater harvesting is being affected due to more geological disturbance. However, trials

	consultation with Regional Director, Central Ground Water Board.	shall be carried out for rainwater harvesting in association with R & D group of company.
(xv)	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.	Mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05. 2014.The mining equipment's have been shifted to other units for its utilization. As a practice, the trucks were covered with tarpaulin during dispatch of manganese ore from mine to Ferro Alloys Plant and Railway Siding located at Joda. OB was being transported by dumper from mine face to dumps located near the quarry itself within 1.5 Km. So, it was not in practice to cover the OB transportation trucks with tarpaulin. As a practice, all the trucks meant for transportation of mineral from mine to our captive plant & Railway Siding at Joda were bearing the "Pollution under Control' certificate. The emissions are under control. Provision of water sprinkling by mobile water sprinklers to suppress fugitive emission from haul roads. The processed manganese ore was being transferred manually; hence there was no fugitive emission during transfer of ore.
(xvi)	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be Implemented.	Mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05.2014. But the practice is that: However, as a practice the blasting, is restricted during day hours only and is carried out with the optimum blasting parameters based on the actual geo-mining conditions. This gives the measures to control over the ground vibrations and to arrest fly rocks and boulders. Controlled blasting technique with bottom initiation pattern is being practiced.
(xvii)	Drills shall either be operated with dust extractors or equipped with water Injection system	The said condition would be strictly adhered to after resumption of mining operation.
(xviii)	Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests	In pursuance to the Circular No 02/2010, Dt.06.04.2010 passed by Indian Bureau of Mines, Govt. of Odisha has authorized Orissa Remote Sensing Application Centre (ORSAC) to carry out the DGPS survey work for its compliance. Accordingly, we have requested

	and its Regional Office, Bhubaneshwar.	ORSAC to conduct the survey work of mine lease boundary for super imposition over the vectorised village map & Cartosat-2 and LISS-IV (Scale-1:5,000) satellite image. In the meantime, the DGPS survey of lease boundary has been completed and we had further requested ORSAC for preparation of land use map on 11.10.2011 to comply this condition. The proposed survey work has been completed by ORSAC and the plan has been submitted by 30th June'13 to Ministry of Environment and Forest and its regional office. It may please be noted that, no further land degradation due to discontinuation of development of the mine since 27.02.2011, hence the land use within the lease area of 822 ha submitted on 11.10.2011 is same as of now.
(xix)	Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.	"Consent to operate" Order No.118 vide letter No. 8006 / IND-I-CON-191 Dt 11.05.2011 valid up to 31.03.2016. We had applied application for CTO renewal on time vides our online application no. 410153. However State Pollution Control Board, Odisha has directed us to re-approach SPCB, Odisha after grant of Forest Clearance.
(xx)	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated during mining operation.	Sanitary sewage generated from staff quarters, offices & canteen waste water will continue to be discharged to septic tank/ soak pit. The service vehicles are being maintained at workshop of Joda West Mn. Mine, where effluents are channelized to oil separation pit & the oil free water is being recycled.
(xxi)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant, leopard, Indian python etc. spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for	3rd and 4th renewal forest diversion proposal has been submitted to State Govt. On receipt of demand from DFO, Bonai Division, we have paid Rs. 3,53,46,000/- towards implementation of Regional Wild Life Management Plan as prepared for Bonai & Keonjhar Forest Division. Further, Site specific wildlife management plan has been prepared and approved by

	implementation of the conservation plan and/or Regional Wildlife Management Plan of the State Government shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office within 3 months.	Principal Chief Conservator of Forest (WL) & Chief Wildlife Warden, Odisha. vide letter no-2375/1 WL-SSP-70/2015 dated- 11th March 2015.
(xxii)	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.	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. A progressive mine closure plan along with Scheme of Mining & Mining Plan has been approved by IBM. Implementation of same is being carried out as per plan.
Sl.No.	**B : General conditions**	**Compliance Status**
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	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 MoEF.
(ii)	No change in the calendar plan including excavation, quantum of mineral manganese ore and waste should be made.	Plan for production of Manganese Ore and excavation of waste has been prepared and it will be strictly adhered after resumption of mining operation.
(iii)	Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM, SPM, S02, NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Five ambient air quality monitoring stations have been established out of which 2 nos. in core zone (Near Dispensary close proximity to residential and mining area at Block-I Pit) and 3 nos. in buffer zone (at Chormalda, Kundrapani and Kolha Roida). Ambient Air samples are being drawn at a regular interval for analysis of PM_{10}, $PM_{2.5}$, $S0_2$, NOx.
(iv)	Data on ambient air quality (RPM, SPM, S02, NOx) should be regularly submitted to the Ministry including its Regional office located at Bhubneshwar and the State Pollution Control Board / Central Pollution Control Board once in six months.	Samples are drawn twice in a week in core zone and once in a quarter in buffer zone to ascertain the 24 hour monitoring average for PM_{10}, $PM_{2.5}$, SO_2 & NOx, CO & Mn. Data on ambient air quality monitoring for every month is being submitted to State Pollution Control Board. Abstract of the monthly monitoring data on ambient air quality is enclosed as **Annexure – V.** It was observed that: a) PM_{10} varied from 40.4 µg/m3 (Oct-17) to

		73.4 µg/m3 (Jan-18) in Dispensary area. b) PM_{10} varied from 45.6 µg/m3 (Oct-17) to 78.6 µg/m3 (Jan-18) in Pit area. c) $PM_{2.5}$ varied from 18.9 µg/m3 (Oct-17) to 36.9 µg/m3 (Jan-18) in Dispensary area. d) $PM_{2.5}$ varied from 22.3 µg/m3 (Oct-17) to 39.9 µg/m3 (Jan-18) in Pit area. e) $S0_2$ varied from 4.0 µg/m3 (Oct-17) to 5.2 µg/m3 (Jan-18) in dispensary area. f) $S0_2$ varied from 4.2 µg/m3 (Oct-17) to 5.8 µg/m3 (Jan-18) in pit area. g) NO_x varied from 9.7 µg/m3 (Oct-17) to 15.2 µg/m3 (Jar-18) in Dispensary area. h) NO_x varied from 10.4 µg/m3 (Oct-17) to 15.36 µg/m3 (Dec-17) in pit area. i) CO varied from 0.15 mg/m3 (Oct-17) to 0.37 mg/m3 (Jan-18) in dispensary area. j) CO varied from 0.18 mg/m3 (Oct-17) to 0.42 mg/m3 (Feb-18) in pit area. The dust fall and Soil quality result is enclosed as **Annexure-VI (Dust Fall) & VII (Soil)**
(v)	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	No fugitive dust monitoring has been carried out during the period October'17 to March'18 as the mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05.2014.
(vi)	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with earplugs / muffs.	Mining operation and allied activities were discontinued since 17th May 2014 in pursuance Supreme Court verdict 16.05.2014. Noise monitoring done during the period October 17 to March 18 is attached in **Annexure VIII**
(vii)	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.	The services vehicles deployed in the mine are being maintained at Joda West Mn.Mines which is under same management control. The oil separation system has been provided at workshop at Joda West and working effectively.
(viii)	Personnel working in dusty areas should wear protective respiratory devices and they should also be	As a practice, suitable dust masks are being provided to employees (departmental & contractual) engaged in dusty operations. It

	provided with adequate training and information on safety and health aspects.	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 programs are being conducted for all employees to avert manganese poisoning.
	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.	Periodical Medical Examination of employees (departmental & contractual) are conducted as per prescribed norms of Mines Rule, 1955. The initial and periodical examination includes blood hematology, 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. During the calendar year 2017, 103 employees underwent There are no findings of pneumoconiosis and manganese poisoning which is classified as occupational disease.
(ix)	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.	The department is in place and the Head of the department is reporting to General Manager of the division. The organizational structure in place is enclosed as **Annexure-X.**
(x)	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.	Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. The utilization budget for environment management for the period 2017-18, for the construction of parapet wall/ retaining wall at toe of dump Rs 4,30,000 and Rs 5,50,000 for construction of settling ponds no fund was spend as mining activity was suspended and dumps were not extended. Rs 3,78,125 was allotted for Afforestation of dumps Rs 77,337 was spent. The amount was less due to unavailability of mature dumps. The budget kept for Environmental Monitoring was Rs. 1,70,000 out of which Rs. 7,32,625 was spent. The cost incurred in environment monitoring is less as rise in the price of environment monitoring was less than expected. We are doing the environment

		monitoring as per guidelines.
(xi)	The project authorities should Inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	The date of financial closure will be intimated to the Regional Office located at Bhubaneswar prior to date of closure of this project.
(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 *I* information / monitoring reports.	We shall extend to full co-operation to the officers of the Regional Office by furnishing the requisite data / information / monitoring reports.
(xiii)	The project proponent shall submit six monthly report on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar,. Central Pollution Control Board and State Pollution Control Board.	Half yearly compliance status for the specific and general conditions pertaining to the Environment Clearance is being submitted to Regional Office, MoEF, Bhubaneswar within scheduled time and uploaded in company website : http://www.tatasteelindia.com/corporate-citizen/environment-compliance-reports.asp
(xiv)	A copy of clearance letter will be marked to concerned Panchayat /local NGO, if any, from whom suggestion / representation has been received while processing the proposal.	Copy of the clearance letter marked to Sarpanch, Malda gram Panchayat on 12.06.2007.
(xv)	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.
(xvi)	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the Issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at **http://envfor.nic.in** and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubneshwar.	Details of Env. Clearance with regard to Malda Manganese mines published in the below mentioned newspapers - New Indian express (Daily English) dated 22nd Apr'07 & - Samaja (Daily Odiya) dated 22nd Apr'07

3	The Ministry or any other competent-authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.	Noted.
4	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted.
5	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under.	Noted

Yours faithfully
F: TATA STEEL LTD.

Agent, Malda Mn. Mine &
Head (Manganese Group of Mines), Joda

Annexure – I Ground Water Level Monitoring

Visiontek Consultancy Services Pvt.Ltd.
(An Enviro Engineering Consulting Cell)
ISO 14001:2004
ISO 9001: 2008
OHSAS 18001:2007

Ref.: VCSPL/17/R-3137 Date: 04.12.2017

GROUND WATER (LEVEL) QUALITY ANALYSIS REPORT FOR THE MONTH OF NOV-2017

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **GW-1:** Ranishal , **GW-2:** Kolaroida
3. Level measured by : VCSPL Representative in presence of TATA Representative

Sl. No	Date of Sampling	Name of Village	Unit	Result
1	10.11.2017	Ranishal	Mt./bgl	3.7
2	10.11.2017	Kolaroida	Mt./bgl	3.4

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

*For **Visiontek Consultancy Services Pvt. Ltd.***

Plot No-108,District Centre,Chandrasekharpur,Bhubaneswar-16,Tel-91-674-2744594, 3250790
Email:visiontekin@gmail.com,visiontekin@yahoo.co.in,visiontek@vcspl.org, Visit us at: www.vcspl.org
"Committed For The Better Environment"

Ref.: Env Lab/18/R-494 *Date:* 08.03.2018

GROUND WATER (LEVEL) QUALITY ANALYSIS REPORT FOR THE MONTH OF FEB-2018

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **GW-1:** Ranishal , **GW-2:** Kolaroida
3. Level measured by : VCSPL Representative in presence of TATA Representative

Sl. No	Date of Sampling	Name of Village	Unit	Result
1	**02.02.2018**	Ranishal	Mt./bgl	11.9
2	**23.02.2018**	Kolaroida	Mt./bgl	12.2

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

*For **Visiontek Consultancy Services Pvt. Ltd.***

Annexure – II: Ground Water Quality Monitoring

Visiontek Consultancy Services Pvt.Ltd.
(An Enviro Engineering Consulting Cell)
ISO 14001:2004
ISO 9001: 2008
OHSAS 18001:2007

Ref.: VCSPL/171R-3256 Date.: 04.12.2017

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF NOV-2017

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **GW-1: T/W Malda Camp**
   GW-2: O/W Near Ranisha
3. Date of sampling : 10.11.2017
4. Date of analysis : 11.11.2017 to 17.11.2017
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS -10500:1991	Analysis Results	
					GW-1	GW-2
Essential Characteristics						
1	Colour	APHA 2120 B, C	Hazen	**5**	CL	CL
2	Odour	APHA 2150 B	--	**U/O**	U/O	U/O
3	Taste	APHA 2160 C	--	**Agreeable**	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	**5**	<0.2	<0.2
5	pH Value	APHA 4500H^+ B	--	**6.5-8.5**	7.18	7.24
6	Total Hardness (as $CaCO_3$)	APHA 2340 C	mg/l	**300**	144.0	133.0
7	Iron (as Fe)	APHA 3500Fe, B	mg/l	**0.3**	0.29	0.26
8	Chloride (as Cl)	APHA 4500Cl^- B	mg/l	**250**	35.0	31.0
9	Residual, free Chlorine	APHA 4500Cl, B	mg/l	**0.2**	ND	ND
Desirable Characteristics						
10	Dissolved Solids	APHA 2540 C	mg/l	**500**	218.0	200.0
11	Calcium (as Ca)	APHA 3500Ca B	mg/l	**75**	39.3	36.9
12	Magnesium (as Mg)	APHA 3500Mg B	mg/l	**30**	11.2	10.0
13	Copper (as Cu)	APHA 3111 B,C	mg/l	**0.05**	<0.05	<0.05
14	Manganese (as Mn)	APHA 3500Mn B	mg/l	**0.1**	0.012	0.01
15	Sulphate (as SO_4)	APHA 4500 SO_4^{2-} E	mg/l	**200**	4.9	5.2
16	Nitrate (as NO_3)	APHA 4500 NO_3^- E	mg/l	**45**	2.1	2.14
17	Fluoride (as F)	APHA 4500F^- C	mg/l	**1.0**	0.014	0.016
18	Phenolic Compounds (as C_6H_5OH)	APHA 5530 B,D	mg/l	**0.001**	<0.001	<0.001
19	Mercury (as Hg)	APHA 3500 Hg	mg/l	**0.001**	<0.001	<0.001
20	Cadmium (as Cd)	APHA 3111 B,C	mg/l	**0.01**	<0.001	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	**0.01**	<0.001	<0.001
22	Arsenic (as As)	APHA 3114 B	mg/l	**0.05**	<0.001	<0.001
23	Cyanide (as CN)	APHA 4500 CN^- C,D	mg/l	**0.05**	ND	ND
24	Lead (as Pb)	APHA 3111 B,C	mg/l	**0.05**	<0.001	<0.001
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	**5**	<0.05	<0.05
26	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	**0.2**	<0.2	<0.2
27	Chromium (as Cr^{+6})	APHA 3500Cr B	mg/l	**0.05**	<0.05	<0.05
28	Mineral Oil	APHA 5220 B	mg/l	**0.01**	<0.01	<0.01
29	Alkalinity	APHA 2320 B	mg/l	**200**	130.0	120.0
30	Aluminium as(Al)	APHA 3500Al B	mg/l	**0.03**	<0.001	<0.001
31	Boron (as B)	APHA 4500B, B	mg/l	**1**	<0.01	<0.01
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	--	<0.001	<0.001
33	Pesticide	APHA 6630 B,C	mg/l	**Absent**	Absent	Absent

Note: CL : Colourless, AL: Agreeable, U/O : Unobjectionable, ND:Not Detected.

*For **Visiontek Consultancy Services Pvt. Ltd.***

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Ref.: Env Lab/18/R- 492 Date: 03.03.2018

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF FEB-2018

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **GW-1: T/W Malda Camp**
   GW-2: O/W Near Ranisha
3. Date of sampling : 15.02.2018
4. Date of analysis : 16.02.2018 to 22.02.2018
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS -10500:1991	Analysis Results	
					GW-1	GW-2
Essential Characteristics						
1	Colour	APHA 2120 B, C	Hazen	**5**	CL	CL
2	Odour	APHA 2150 B	--	**U/O**	U/O	U/O
3	Taste	APHA 2160 C	--	**Agreeable**	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	**5**	<0.2	<0.2
5	pH Value	APHA 4500H$^+$ B	--	**6.5-8.5**	7.28	7.32
6	Total Hardness (as $CaCO_3$)	APHA 2340 C	mg/l	**300**	150.0	146.0
7	Iron (as Fe)	APHA 3500Fe, B	mg/l	**0.3**	0.3	0.22
8	Chloride (as Cl)	APHA 4500Cl$^-$ B	mg/l	**250**	39.0	33.0
9	Residual, free Chlorine	APHA 4500Cl, B	mg/l	**0.2**	ND	ND
Desirable Characteristics						
10	Dissolved Solids	APHA 2540 C	mg/l	**500**	232.0	216.0
11	Calcium (as Ca)	APHA 3500Ca B	mg/l	**75**	41.7	40.9
12	Magnesium (as Mg)	APHA 3500Mg B	mg/l	**30**	11.2	10.7
13	Copper (as Cu)	APHA 3111 B,C	mg/l	**0.05**	<0.05	<0.05
14	Manganese (as Mn)	APHA 3500Mn B	mg/l	**0.1**	0.013	0.009
15	Sulphate (as SO_4)	APHA 4500 SO_4^{2-} E	mg/l	**200**	5.3	4.9
16	Nitrate (as NO_3)	APHA 4500 NO_3^- E	mg/l	**45**	1.96	1.88
17	Fluoride (as F)	APHA 4500F$^-$ C	mg/l	**1.0**	0.016	0.015
18	Phenolic Compounds (as C_6H_5OH)	APHA 5530 B,D	mg/l	**0.001**	<0.001	<0.001
19	Mercury (as Hg)	APHA 3500 Hg	mg/l	**0.001**	<0.001	<0.001
20	Cadmium (as Cd)	APHA 3111 B,C	mg/l	**0.01**	<0.001	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	**0.01**	<0.001	<0.001
22	Arsenic (as As)	APHA 3114 B	mg/l	**0.05**	<0.001	<0.001
23	Cyanide (as CN)	APHA 4500 CN$^-$ C,D	mg/l	**0.05**	ND	ND
24	Lead (as Pb)	APHA 3111 B,C	mg/l	**0.05**	<0.001	<0.001
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	**5**	<0.05	<0.05
26	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	**0.2**	<0.2	<0.2
27	Chromium (as Cr^{+6})	APHA 3500Cr B	mg/l	**0.05**	<0.05	<0.05
28	Mineral Oil	APHA 5220 B	mg/l	**0.01**	<0.01	<0.01
29	Alkalinity	APHA 2320 B	mg/l	**200**	138.0	132.0
30	Aluminium as(Al)	APHA 3500Al B	mg/l	**0.03**	<0.001	<0.001
31	Boron (as B)	APHA 4500B, B	mg/l	**1**	<0.01	<0.01
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	--	<0.001	<0.001
33	Pesticide	APHA 6630 B,C	mg/l	**Absent**	Absent	Absent

Note: CL : Colourless, AL: Agreeable, U/O : Unobjectionable, ND:Not Detected.

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For Visiontek Consultancy Services Pvt. Ltd.

Annexure III – Analysis of Trace Metal Ground Water

Visiontek Consultancy Services Pvt.Ltd.
(An Enviro Engineering Consulting Cell)
ISO 14001:2004
ISO 9001: 2008
OHSAS 18001:2007

Ref.: VCSPL/17/R-3257 Date.: 04.12.2017

GROUND WATER (TRACE METAL) QUALITY ANALYSIS REPORT FOR THE MONTH OF NOV-2017

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **GW-1: T/W Malda Camp**
3. Date of sampling : 10.11.2017
4. Date of analysis : 11.11.2017 to 16.11.2017
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS -10500:1991	Analysis Results
					GW-1
1	Iron (as Fe)	APHA 3500Fe, B	mg/l	**0.3**	0.24
2	Copper (as Cu)	APHA 3111 B,C	mg/l	**0.05**	< 0.05
3	Manganese (as Mn)	APHA 3500Mn B	mg/l	**0.1**	0.01
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
6	Cadmium (as Cd)	APHA 3111 B,C	mg/l	**0.01**	< 0.01
7	Selenium (as Se)	APHA 3114 B	mg/l	**0.01**	< 0.001
8	Arsenic (as As)	APHA 3114 B	mg/l	**0.05**	< 0.001
9	Lead (as Pb)	APHA 3111 B,C	mg/l	**0.05**	< 0.01
10	Zinc (as Zn)	APHA 3111 B,C	mg/l	**5**	<0.05

For Visiontek Consultancy Services Pvt. Ltd.

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

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Ref.: Envlab/18/R-493 Date: 03.03.2018

GROUND WATER (TRACE METAL) QUALITY ANALYSIS REPORT FOR THE MONTH OF FEB-2018

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **GW-1: T/W Malda Camp**
3. Date of sampling : 15.02.2018
4. Date of analysis : 16.02.2018 to 22.02.2018
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS -10500:1991	Analysis Results
					GW-1
1	Iron (as Fe)	APHA 3500Fe, B	mg/l	**0.3**	0.28
2	Copper (as Cu)	APHA 3111 B,C	mg/l	**0.05**	< 0.05
3	Manganese (as Mn)	APHA 3500Mn B	mg/l	**0.1**	0.014
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
6	Cadmium (as Cd)	APHA 3111 B,C	mg/l	**0.01**	< 0.01
7	Selenium (as Se)	APHA 3114 B	mg/l	**0.01**	< 0.001
8	Arsenic (as As)	APHA 3114 B	mg/l	**0.05**	< 0.001
9	Lead (as Pb)	APHA 3111 B,C	mg/l	**0.05**	< 0.01
10	Zinc (as Zn)	APHA 3111 B,C	mg/l	**5**	<0.05

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For Visiontek Consultancy Services Pvt. Ltd.

Annexure – IV

Malda Mn Mines, M/s Tata Steel limited.

Abstract of Surface Water Quality Monitoring Report

SURFACE WATER QUALITY ANALYSIS REPORT OCT 17 TO MARCH 18										
Sampling Location:SW-1: Kundra Nallah entering Malda										
Sl. No	**Parameter**	**Unit**	**Standard as per IS:2296:1992, Class'C'**	Oct		Nov	Dec	Jan	Feb	March
1	Dissolved Oxygen (minimum)	mg/l	**4**	6.1	5.8	5.7	5.8	5.5	5.2	4.9
2	BOD (3) days at 270C (max)	mg/l	**3**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
3	Total Coli form	MPN/100 ml	**5000**	370	900	370	270	350	370	270
4	pH Value		**6.0-9.0**	7.24	7.2	7.24	7.26	7.28	7.32	7.4
5	Colour (max)	Hazen	**300**	4	6	1	CL	CL	CL	CL
6	Total Dissolved Solids	mg/l	**1500**	109	116	120	125	125	137	133.0
7	Copper as Cu (max)	mg/l	**1.5**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8	Iron as Fe (max)	mg/l	**0.5**	0.45	0.48	0.42	0.44	0.49	0.48	0.47
9	Chloride (max)	mg/l	**600**	18	19	21	24	25	28	30.0
10	Sulphates (SO4) (max)	mg/l	**400**	3.6	4.1	4.3	4.6	4.8	4.9	4.6
11	Nitrate as NO3 (max)	mg/l	**50**	1.3	1.6	1.7	1.6	1.8	1.8	1.68
12	Fluoride as F (max)	mg/l	**1.5**	0.013	0.014	0.012	0.011	0.012	0.02	0.015
13	Phenolic Compounds as C6H5OH (max)	mg/l	**0.005**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Cadmium as Cd (max)	mg/l	**0.01**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
15	Selenium as Se (max)	mg/l	**0.05**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Arsenic as As	mg/l	**0.2**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Cyanide as CN (max)	mg/l	**0.05**	ND	ND	ND	ND	ND	ND	ND
18	Lead as Pb(max)	mg/l	**0.1**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Zinc as Zn(max)	mg/l	**15**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Hexa Chromium as Cr +6	mg/l	**0.05**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Anionic Detergents (max)	mg/l	**1**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

SURFACE WATER QUALITY ANALYSIS REPORT OCT 17 TO MARCH 18										
Sampling Location:SW-2 : Kundra Nallah leaving Malda										
Sl. No	**Parameter**	**Unit**	**Standard as per IS:2296:1992, Class'C'**	Oct		Nov	Dec	Jan	Feb	March
1	Dissolved Oxygen (minimum)	mg/l	**4**	5.9	5.7	5.9	5.6	5.3	5.7	5.2
2	BOD (3) days at 270C (max)	mg/l	**3**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
3	Total Coli form	MPN/100 ml	**5000**	410	450	410	310	310	310	170
4	pH Value		**6.0-9.0**	7.22	7.26	7.22	7.28	7.24	7.36	7.36
5	Colour (max)	Hazen	**300**	4	6	1	CL	CL	CL	CL
6	Total Dissolved Solids	mg/l	**1500**	114	122	118	126	131	136	138.0
7	Copper as Cu (max)	mg/l	**1.5**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8	Iron as Fe (max)	mg/l	**0.5**	0.46	0.49	0.45	0.46	0.51	0.45	0.46
9	Chloride (max)	mg/l	**600**	19	21	24	25	28	28	32.0
10	Sulphates (SO4) (max)	mg/l	**400**	3.8	4.3	4.5	4.8	4.9	4.7	4.9
11	Nitrate as NO3 (max)	mg/l	**50**	1.5	1.7	1.6	1.7	1.9	1.7	1.78
12	Fluoride as F (max)	mg/l	**1.5**	0.015	0.013	0.014	0.012	0.013	0.022	0.018
13	Phenolic Compounds as C6H5OH (max)	mg/l	**0.005**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
14	Cadmium as Cd (max)	mg/l	**0.01**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
15	Selenium as Se (max)	mg/l	**0.05**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16	Arsenic as As	mg/l	**0.2**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
17	Cyanide as CN (max)	mg/l	**0.05**	ND	ND	ND	ND	ND	ND	ND
18	Lead as Pb(max)	mg/l	**0.1**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Zinc as Zn(max)	mg/l	**15**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Hexa Chromium as Cr +6	mg/l	**0.05**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Anionic Detergents (max)	mg/l	**1**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Annexure – V

Malda Mn Mines, M/s Tata Steel limited.

Abstract of Air Quality Monitoring Report**.**

MMM (Mine Pit)													
Monthly Average	**PM_{10} (µg/m³)**	**$PM_{2.5}$ (µg/m³)**	**SO_2 (µg/m³)**	**NOx (µg/m³)**	**O_3 (µg/m³)**	**CO (mg/m³)**	**NH_3 (µg/m³)**	**Pb (µg/m³)**	**Ni (ng/m³)**	**As (ng/m³)**	**Benzene (µg/m³)**	**Benzo(a) pyrene (ng/m³)**	**Mn (µg/m3)**
Oct-17	45.6	22.3	<4.2	<10.4	<4.0	0.18	<20.0	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Nov-17	57.9	28.9	<4.5	12.4	<4.8	0.28	<21.1	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Dec-17	73.63	38.34	5.42	15.36	7.77	0.38	27.93	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Jan-18	78.6	39.9	5.8	16.1	8.6	0.4	28.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Feb-18	70.6	35.3	5.2	15.3	9.3	0.42	25.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Mar-18	64.76	32.24	4.41	12.96	6.87	0.35	21	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
AVERAGE	**65.18**	**32.83**	**5.21**	**14.42**	**8.14**	**0.34**	**25.78**	**< 0.001**	**< 0.01**	**< 0.001**	**< 0.001**	**< 0.002**	**<0.001**

MMM (Dispensary)													
Monthly Average	**PM_{10} (µg/m³)**	**$PM_{2.5}$ (µg/m³)**	**SO_2 (µg/m³)**	**NOx (µg/m³)**	**O_3 (µg/m³)**	**CO (mg/m³)**	**NH_3 (µg/m³)**	**Pb (µg/m³)**	**Ni (ng/m³)**	**As (ng/m³)**	**Benzene (µg/m³)**	**Benzo(a) pyrene (ng/m³)**	**Mn (µg/m3)**
Oct-17	40.4	18.9	<4.0	<9.7	<4.0	0.15	< 20.0	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Nov-17	52	25.4	<4.3	11.3	<4.2	0.25	<20.5	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Dec-17	42.90	20.04	4.55	11.07	6.05	0.22	<20.0	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Jan-18	73.4	36.9	5.2	15.2	7.7	0.37	25	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Feb-18	64.7	32.8	4.7	14.4	8.2	0.36	22.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Mar-18	61.02	29.64	4.18	11.67	5.43	0.33	<20.0	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
AVERAGE	**55.74**	**27.28**	**4.66**	**12.73**	**6.85**	**0.28**	**23.90**	**< 0.001**	**< 0.01**	**< 0.001**	**< 0.001**	**< 0.002**	**<0.001**

Visiontek Consultancy Services Pvt.Ltd.
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ISO 14001:2004
ISO 9001: 2008
OHSAS 18001:2007

Ref.: VCSPL/17/R - 3138 Date: 04.12.2017

DUST FALL MONITORING REPORT FOR THE MONTH OF NOV-2017

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

Sl No.	Parameters	Unit	Analysis Results
			DF-1
1.	Cobalt as Co	%	<0.001
2.	Nickel as Ni	%	<0.001
3.	Mercury as Hg	%	<0.001
4.	Arsenic as As	%	<0.001

Total Dust fall for the month of Nov-2017=0.498 t/km^2/month

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

*For **Visiontek Consultancy Services Pvt. Ltd.***

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Ref.: Env Lab/18/R - 495 Date: 03.03.2018

DUST FALL MONITORING REPORT FOR THE MONTH OF FEB-2018

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

Sl No.	Parameters	Unit	Analysis Results
			DF-1
1.	Cobalt as Co	%	<0.001
2.	Nickel as Ni	%	<0.001
3.	Mercury as Hg	%	<0.001
4.	Arsenic as As	%	<0.001

Total Dust fall for the month of Feb-2018=0.948 t/km^2/month

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For Visiontek Consultancy Services Pvt. Ltd.

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ISO 9001: 2008
OHSAS 18001:2007

Ref.: VCSPL/17/R-3139 Date: 04.12.2017

SOIL QUALITY ANALYSIS REPORT FOR THE MONTH OF NOV-2017

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **S-1: Near Block-I**
3. Date of Sampling : 10.11.2017
4. Date of Analysis : 11.11.2017 to 16.11.2017
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl No.	Parameters	Unit	Analysis Results
			S-1
1.	Cobalt as Co	%	0.0019
2.	Nickel as Ni	%	0.048
3.	Mercury as Hg	%	<0.000002
4.	Arsenic as As	%	<0.000002

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

*For **Visiontek Consultancy Services Pvt. Ltd.***

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"Committed For The Better Environment"

Ref.: Env Lab/18/R-496 *Date:* 03.03.2018

SOIL QUALITY ANALYSIS REPORT FOR THE MONTH OF FEB-2018

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Sampling Location : **S-1: Near Block-I**
3. Date of Sampling : 15.02.2018
4. Date of Analysis : 16.02.2018 to 22.02.2018
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl No.	Parameters	Unit	Analysis Results
			S-1
1.	Cobalt as Co	%	0.0021
2.	Nickel as Ni	%	0.044
3.	Mercury as Hg	%	<0.000002
4.	Arsenic as As	%	<0.000002

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

For Visiontek Consultancy Services Pvt. Ltd.

Visiontek Consultancy Services Pvt.Ltd.
(An Enviro Engineering Consulting Cell)
ISO 14001:2004
ISO 9001: 2008
OHSAS 18001:2007

Ref.: VCSPL/17/R - 3140

Date.: 04.12.2017

NOISE MONITORING REPORT FOR THE MONTH OF NOV-2017

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Recorded By : VCSPL Representative in presence of TATA Representative

AAQ				Day Time	Night Time
Sl. No	Date	Name of Location	Unit	Result	
1	10.11.2017	Township	db	50.8	30.5
2		Hospital		46.9	30.2
3		Office Area		56.2	26.2
4		Mines Area		62.8	34.1
CPCB Standard				**75**	**70**

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

*For **Visiontek Consultancy Services Pvt. Ltd.***

Plot No-108,District Centre,Chandrasekharpur,Bhubaneswar-16,Tel-91-674-2744594, 3250790
Email:visiontekin@gmail.com,visiontekin@yahoo.co.in,visiontek@vcspl.org, Visit us at: www.vcspl.org

"Committed For The Better Environment"

Ref.: Env lab/18/R - 497 *Date:* 03.03.2018

NOISE MONITORING REPORT FOR THE MONTH OF FEB-2018

1. Name of Industry : **Malda Manganese Mines (M/s TATA Steel Limited)**
2. Recorded By : VCSPL Representative in presence of TATA Representative

AAQ				Day Time	Night Time
Sl. No	**Date**	**Name of Location**	**Unit**	**Result**	
1	15.02.2018	Township	db	52.5	38.9
2		Hospital		46.1	34.4
3		Office Area		54.8	39.8
4		Mines Area		60.4	36.1
CPCB Standard				**75**	**70**

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For Visiontek Consultancy Services Pvt. Ltd.

Annexure – IX :LIST OF ENVIRONMENTAL MONITORING EQUIPMENT

LIST OF ENVIRONMENTAL MONITORING EQUIPMENT		
Ambient Air Quality		
Sl.No.	**Name of the Instrument**	**Parameter**
1	Respirable Dust sampler	PM_{10}
2	Fine Particulate Sampler	$PM_{2.5}$
3	Spectrophotometer UV-Visible range	SO_2,NO_x,NH_3,O_3,
4	NDIR	CO
5	AAS	As, Ni, Pb ,Mn
6	GC	C_6H_6,Bap
Other Paraphernalia for analysis of air quality are also available in the laboratory.		
Water Quality		
Sl.No.	**Name of the Instrument**	**Parameter**
1	Analytical weighing Balance	Used for weighing the chemicals
2	Micro Balance	Used for weighing CRMs
3	AAS with VGA and Hallow cathode lamps	All Heavy metals (Arsenic, Mercury, Selenium, Cadmium, Copper,Lead,Zinc, Aluminium, etc..)
4	Spectrophotometer UV-Visible range	Nitrate,Nitrite,Sulphate, Chromium(VI),Fluoride, Cyanide,Boron,Iron, Phenolic compounds
5	Gas Chromatography	PAH,Pesticide
6	Flame Photometer	Sodium ,Potassium
7	BOD Incubator	BOD
8	COD Digester	COD
9	Muffle Furnace	Total volatile solids, Fixed solids
10	Hot Air Oven	Total Suspended Solids, Total Dissolved Solids
11	pH meter	pH
12	Conductivity meter	Conductivity
13	Turbidity Meter	Turbidity
14	Bacteriological Incubator	Total coli form and fecal coli form
15	Autoclave	sterilization
16	Microscope	Bacteriological colony count
17	Magnetic stirrer	Stirring purpose
18	Vacuum filtration unit	Rapid filtration
19	Water Bath	Boiling and evaporation purpose
20	Cadmium reduction column	Nitrate
21	Kjeldal Equipment	Ammonia and Organic Nitrogen
22	Hot Plate	Digestion
23	Pizometer	Water level monitoring
24	Aquarium	Bio assay test
Other Paraphernalia for analysis of Water quality are also available in the laboratory.		

Annexure – X

Organizational Structure