



HALF YEARLY COMPLIANCE REPORT

Of

Environmental Clearance

(Period from April 2022 TO September 2022)

For

55,000 TPA High Carbon Ferro-Chrome Plant,

Of

M/s Tata Steel Limited

At- Gopalpur, Tehsil- Chhatrapur, District- Ganjam, Odisha

Half-Yearly Compliance Report (April 2022 to September 2022) of Environment Clearance Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014 from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam, Odisha by TATA Steel Limited

| Sl. No. | Specific Conditions | Compliance/Status |
|---------|---|---|
| 1 | The proponent shall obtain necessary CRZ clearance under the provision of CRZ Notification, 2010 | We have been granted CRZ Clearance under the provision of CRZ Notification, 2011 on 18.03.2013 vide letter no. F No. 11-63/2012-IA.III from MoEF & CC (IA Division). |
| 2 | No Charcoal shall be used as fuel. Pet Coal should be used as fuel instead of charcoal from unknown sources. | No Charcoal is used as fuel for plant operations. |
| 3 | Continuous monitoring facilities for all the stacks and sufficient air pollution control equipment viz. fume extraction system with bag filters, ID fan and stack of adequate height to submerged arc furnace shall be provided to control emission below 50 mg/Nm ³ | <ul style="list-style-type: none"> • Installation of Continuous monitoring of SPM for process stack is in progress. • Fume Extraction System with bag filters and ID fan has been installed to control emission. • Adequate stack height is maintained in submerged arc furnace. • Dust extraction system also installed. |
| 4 | The National Ambient Air Quality Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16 th November 2009 shall be followed. | NAAQ Standards have been referred for air quality monitoring and is being complied. |
| 5 | Secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines / Code of Practice issued by the CPCB shall be followed. | Water sprinkling on roads/operating areas is being carried out on a regular basis to control the fugitive emissions. |
| 6 | The total water requirement shall not exceed 5.5 ML.D. 'Zero' effluent discharge shall be strictly followed, and no wastewater should be discharged outside the premises. | The water requirement for 55,000 TPA of Ferro Chrome Plant is 2000 KLD approx. The ETP and STP have been installed and no wastewater is discharged outside the premises. |
| 7 | Efforts shall be made to make use of rainwater harvested. If needed, capacity of the reservoir should be enhanced to meet the maximum water requirement. Only balance water requirement should be met from other sources. | The water reservoir of 6.5 lakhs KL capacity is also used to store the rainwater during the monsoon. Rainwater post treatment is used to meet the water requirement. |
| 8 | Regular monitoring of influent and effluent surface, sub-surface and ground water shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or described under the Environment (Protection) Act whichever are more stringent. Leachate study for the effluent generated and analysis should also be regularly carried out and report submitted to the Ministry' Regional Office at Bhubaneswar, SPCB and CPCB. | <ul style="list-style-type: none"> • Surface water quality monitoring is being carried out regularly around the project site by third party registered and NABL accredited labs. • Upstream and downstream surface water is being carried out every month. Ground & Surface Water monitoring results is attached in Annexure-1. |
| 9 | All the Ferro chrome slag shall be used for land filling inside the plant or used as building material only after passing through Toxic Chemical Leachability Potential (TCLP) Test. Otherwise, hazardous substances shall be recovered from the slag and output waste and be disposed in secured landfill as per CPCB guidelines. | Ferro Chrome Slag testing for Toxic Chemical Leachability Potential (TCLP) has been done from IMMT. No hazardous substances found. The same can be used for landfill in low lying areas inside our plant premise. |

A Ramchandra
29/11/22

Dr. Nishu

Half-Yearly Compliance Report (April 2022 to September 2022) of Environment Clearance Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014 from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam, Odisha by TATA Steel Limited

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|----|--|--|
| 10 | Risk and Disaster Management Plan along with the mitigation measures should be prepared and a copy submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB within 3 months of issue of environment clearance letter. | Risk and Disaster Management Plan along with the mitigation measures have been submitted to the MoEF vide letter no. OP-Env/C-04/52/2012 dated 12.11.2012 along with a copy to Eastern Regional Office, MoEF and Odisha State Pollution Control Board, Bhubaneswar. Additionally, an onsite emergency plan approved by Directorate of Factories & Boilers is also in place. |
| 11 | All the commitments made to the public during the Public Hearing / Public Consultation meeting held on 20th September 2011 should be satisfactorily implemented and a separate budget for implementing the same should be allocated and information submitted to the Ministry's Regional Office at Bhubaneswar. | Commitments made to the public during Public hearing is being regularly implemented and monitored by Tata Steel Rural Development Society (TSRDS) within the allocated budget. |
| 12 | As proposed green belt should be developed in at least 33% of the project area. Selection of plant species shall be as per the CPCB guidelines in consultation with the DFO. | Green belt has been development has been taken up in phase wise manner. We planted over 52000 saplings with an average survival rate greater than 95%. |
| 13 | At least 5% of the total cost of the project should be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan should be prepared and submitted to the Ministry's Office at Bhubaneswar. Implementation of such program shall be ensured accordingly in a time bound manner. | <ul style="list-style-type: none"> Separate budget has been earmarked for the CSR activities, community as well as peripheral development activities such as Health, drinking water, Education, Environment etc. and is being done by our Tata Steel Rural Development Society wing. Rupees 189.52 lacs have been spent towards the above-mentioned activities till sep'2022. (Refer Annexure-2) |
| 14 | The Company shall provide housing for construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project. | Necessary infrastructure & facilities for the construction labors was provided during the construction Work. |
| 15 | The Company shall submit within three months their policy towards Corporate Environment Responsibility which should inter-alia address (i) Standard operating process / procedure to being into focus any infringement/deviation/violation of environmental or forest norms/conditions, (ii) Hierarchical system or administrative order of the Company to deal with environmental issues and ensuring compliance to environmental clearance conditions and (iii) System of reporting of noncompliance/violation environmental norms to the Board of Directors of the company and/or stakeholders or shareholders. | The Corporate Environment Policy is in place and has been submitted to the MoEF & CC vide letter no. OP-Env /C-04/52/2012 dated 12.11.2012 with a copy to Regional Office, OSPB. |

ARambhadr
29/11/22

BKwaha

Half-Yearly Compliance Report (April 2022 to September 2022) of Environment Clearance Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014 from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam, Odisha by TATA Steel Limited

| Sl. No. | General Conditions | Compliance/Status |
|---------|--|--|
| 1 | The project authorities must strictly adhere to the stipulations made by the Orissa State Pollution Control Board and the State Government. | Stipulations as made by the State & Central Govt. are being adhered to from time to time. |
| 2 | No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. | Amendment to Environmental Clearance was granted by MoEF & CC vide File no. J-11011/55/2011-IA II(I) on 08.08.2014. |
| 3 | The gaseous emissions from various process units shall conform to the load/mass-based standards notified by the Ministry on 19th May 1993 and standards prescribed from time to time. The State Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location. | The Process units have the gaseous emissions under control and below the prescribed limits. |
| 4 | At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM ₁₀ , SO ₂ and NOX are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months. | Four ambient Air Quality & fugitive Emission monitoring stations installed. The ground level concentration of PM ₁₀ , SO ₂ and NOX etc. are as per the anticipation of SPCB. The Air Quality, Fugitive emission and Stack monitoring result is attached in Annexure-3 . |
| 5 | Industrial wastewater shall 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. The treated wastewater shall be utilized for plantation purpose. | Industrial wastewater generated has been treated in Effluent Treatment Plant conforming to the standards and treated wastewater is recycled and re-used for green belt development, water sprinkling on roads, metal cooling activity etc. |
| 6 | The overall noise levels in and around the plant area shall be kept well within the standards (85dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime). | Ambient Noise monitoring is continuously monitored. Plant area is maintained within the standards. Noise Quality monitoring results is attached in Annexure-4 . |
| 7 | Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act. | Health Records of the workers are being maintained as per Factories Act. Pre-Employment Medical check-up prior to the issue of their gate pass to work inside the site and Periodic Medical Check-up for the workers is being done. |
| 8 | The company shall develop surface water harvesting structures to harvest the rainwater for utilization in the lean season besides recharging the ground water table. | A water reservoir of 6.5 lakhs liter capacity is in place to store the rainwater post monsoon which will be used for plant operation post requisite treatment. |

A. B. Mishra
29/11/22

B. K. Mishra

Half-Yearly Compliance Report (April 2022 to September 2022) of Environment Clearance Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014 from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam, Odisha by TATA Steel Limited

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|----|---|--|
| 9 | <p>The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programs, educational programs, drinking water supply and health care etc.</p> | <ul style="list-style-type: none"> • Environmental Protection measures as indicated in the EIA and EMP report has been implemented. • Socio-economic developmental activities in Health, Education, Sports, agriculture, and infrastructure development are being carried out in the surrounding and periphery villages. |
| 10 | <p>Requisite amount shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.</p> | <p>Separate budget has been earmarked towards capital and operating environment expenditure. Environment Annual Budget – Approx. Rs. 28,27,967/-</p> |
| 11 | <p>A copy of clearance letter shall be sent by the proponent to concern Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.</p> | <ul style="list-style-type: none"> • Environment Clearance copy has been submitted to the concerned Govt. /Private Bodies in Aug 2012. • Environment Clearance letter has been uploaded on the Tata Steel website, www.tatasteel.com |
| 12 | <p>The project proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent the Regional Office of the MoEF at Bhubaneswar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM₁₀, SO₂, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.</p> | <ul style="list-style-type: none"> • Last six-monthly compliance reports have been uploaded to the company's website www.tatasteel.com. • Electronic multi-line display board installed to display the criteria pollutant levels namely; PM₁₀, SO₂, NO_x or critical sectoral parameters, indicated for the projects at main gate of the company for the public domain. • The compliance reports are being sent to the Regional Office, MoEF and the respective zonal office of CPCB and SPCB. |
| 13 | <p>The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar/ CPCB/ SPCB shall monitor the stipulated conditions.</p> | <p>Last Six-Monthly Compliance report for the period October'2021 to March'2022 was submitted to MoEF/OSPCB Regional Office both in hard as well as soft copy in June 2022.</p> |

BK nishu

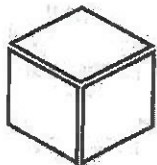
ARambhady
29/11/22
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Half-Yearly Compliance Report (April 2022 to September 2022) of Environment Clearance Vide letter No. J-11011/55/2011-IA-II(I) dated 14.08.2012 and amendment of EC dated 08.08.2014 from MoEF for 55,000 TPA High Carbon Ferro Chrome Plant at Tehsil Chhatrapur, Ganjam, Odisha by TATA Steel Limited

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|----|---|--|
| 14 | The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MoEF at Bhubaneswar by e-mail. | The environmental statement has been submitted every year and the same has been uploaded on company's website www.tatasteel.com . |
| 15 | The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional Office at Bhubaneswar. | Complied. Paper advertisement details are as follows; a. Odia: SAMBAD, Page No. 9 b. English: The New Indian Express, Page no. 5 Advertisement details have been submitted to the MoEF Eastern Regional Office at Bhubaneswar on 19.08.12 and were also attached with the 1 st Half Yearly Compliance Report. |
| 16 | Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work. | <ul style="list-style-type: none"> • Project received final approval from Tata Steel Board in August 2010 and is being funded through internal accruals. • Ground leveling activities was started on 04.05.2013 and the same was being intimated to the board vide letter no PG-Env/C-01/03/2013 & PG-Env/C-01/04/2013, dated 10th May 2013. However, frequent strikes by the local people have deferred the plant operation. |

A. Ramdas
29/11/22

B. K. Nupur



Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

Certified for : ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017

Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

● Infrastructure Engineering
● Water Resource Management
● Environmental & Social Study

● Surface & Sub-Surface Investigation
● Quality Control & Project Management
● Renewable Energy

● Agricultural Development
● Information Technology
● Public Health Engineering

● Mine Planning & Design
● Mineral/Sub-Soil Exploration
● Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

Ref: VCSPL/22/R-9422

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) SURFACE WATER QUALITY ANALYSIS REPORT

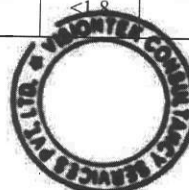
1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : SW1: Khara Nallah Upstream

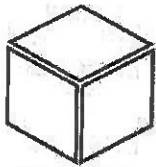
| Sl. No. | Parameter | Testing Methods | Unit | Standards as per IS-2296:1992 Class - 'C' | Analysis Results | | | | | | Average |
|---------|--|---|------------|---|------------------|--------|---------|---------|--------|---------|---------|
| | | | | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| 1 | Colour (max) | Visual Comparison Method APHA 23 RD Ed.2017 : 2120 B, C | Hazen | 300 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2 | pH at 25°C | pH Meter APHA 23 RD Ed.2017 : 4500H ⁺ B | -- | 6.0-9.0 | 7.82 | 7.95 | 7.98 | 7.91 | 6.92 | 7.34 | 7.62 |
| 3 | Dissolved Oxygen (minimum) | Modified Winkler Method APHA 23 RD Ed.2017 : 2540 C | mg/l | 4.0 | 6 | 6.1 | 5.8 | 6.1 | 6.2 | 6.1 | 6.05 |
| 4 | Chloride (max) | Titrimetric Method APHA 23 RD Ed.2017: 4500Cl ⁻ B | mg/l | 600 | 18 | 17 | 18 | 16 | 15 | 17 | 17 |
| 5 | Total Dissolved Solids | Gravimetric Method APHA 23 RD Ed.2017: 2540 C | mg/l | 1500 | 142 | 138 | 150 | 138 | 133 | 151 | 142 |
| 6 | BOD (3) days at 27°C (max) | IS 3025(P-44) : 1993 RA 2003 | mg/l | 3.0 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 7 | Arsenic as As | By AAS Method APHA 23 RD Ed.2017: 3114 B | mg/l | 0.2 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 8 | Lead as Pb(max) | By AAS Method APHA 23 RD Ed.2017 3111 B | mg/l | 0.1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 9 | Cadmium as Cd (max) | By AAS Method APHA 23 RD Ed.2017: 3111 B | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 10 | Hexa Chromium as Cr ⁺⁶ | Diphenyl Carbazide Method APHA 23 RD Ed.2017: 3500Cr B | mg/l | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11 | Copper as Cu (max) | By AAS Method APHA 23 RD Ed.2017: 3111 B | mg/l | 1.5 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 12 | Zinc as Zn(max) | By AAS Method APHA 23 RD Ed.2017: 3111 B | mg/l | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 13 | Selenium as Se (max) | By AAS Method APHA 23 RD Ed.2017: 3500 Se C | mg/l | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 14 | Cyanide as CN (max) | Distillation followed by Spectrophotometric Method APHA 23 RD Ed.2017: 4500 CN ⁻ C,D | mg/l | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 15 | Fluoride as F (max) | Distillation followed by Spectrophotometric Method APHA 23 RD Ed.2017: 4500F ⁻ C | mg/l | 1.5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 16 | Sulphates (SO ₄) (max) | Turbidimetric Method APHA 23 RD Ed.2017: 4500 SO ₄ ²⁻ E | mg/l | 400 | 103.2 | 107.9 | 112.6 | 98.8 | 28.9 | 27.3 | 79.8 |
| 17 | Phenolic Compounds as C ₆ H ₅ OH (max) | Chloroform Extraction By Colorimetric Method APHA 23 RD Ed.2017: 5530 B,D | mg/l | 0.005 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 18 | Iron as Fe (max) | By AAS Method APHA 23 RD Ed.2017: 3500Fe, B | mg/l | 0.5 | 1.02 | 1.06 | 1.12 | 1.08 | 0.14 | 0.24 | 0.8 |
| 19 | Nitrate as NO ₃ (max) | By UV-Screen Method APHA 23 RD Ed.2017: 4500 NO ₃ ⁻ E | mg/l | 50 | 12.8 | 13.2 | 13.8 | 13.6 | 10.86 | 10.8 | 12.5 |
| 20 | Anionic Detergents (max) | Anionic Surfactants as MBAS APHA 23 RD Ed.2017: 5540 C | mg/l | 1.0 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 21 | Total Coli form | By Multiple Tube Fermentation Technique APHA 23 RD Ed.2017: 9221 B | MPN/100 ml | 5000 | 1240 | 1260 | 1240 | 1180 | 1100 | 920 | 1156.7 |
| 22 | Cadmium | By AAS Method APHA 23 RD Ed.2017: 3111 B,C | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 23 | Zinc as Zn | By AAS Method APHA 23 RD Ed.2017: 3111 B,C | mg/l | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 24 | Oil & Grease | By Solvent Extraction Method APHA 23 RD Ed.2017: 5220 B | mg/l | 0.1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 25 | Fecal Coliform | By Multiple Tube Fermentation Technique APHA 23 RD Ed.2017: 9221 E | MPN/100 ml | - | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 |

Reviewed by:



Approved by:





Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

Certified for : ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017

Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

- Infrastructure Engineering
- Water Resource Management
- Environmental & Social Study

- Surface & Sub-Surface Investigation
- Quality Control & Project Management
- Renewable Energy

- Agricultural Development
- Information Technology
- Public Health Engineering

- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

Ref: VCSPL/22/R-9423

Date: 28.11.2022

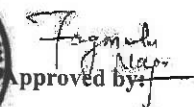
SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) SURFACE WATER QUALITY ANALYSIS REPORT

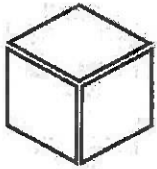
1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : SW2: Khara Nallah Downstream

| Sl. No. | Parameter | Testing Methods | Unit | Standards as per IS-2296:1992 Class - 'C' | Analysis Results | | | | | | Average |
|---------|--|---|------------|---|------------------|--------|---------|---------|--------|---------|---------|
| | | | | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| 1 | Colour (max) | Visual Comparison Method APHA 23 RD Ed.2017 : 2120 B, C | Hazen | 300 | SW-2 | SW-2 | SW-2 | SW-2 | SW-2 | SW-2 | |
| 2 | pH at 25°C | pH Meter APHA 23 RD Ed.2017 : 4500H ⁺ B | -- | 6.0-9.0 | 8.32 | 8.43 | 8.44 | 8.32 | 7 | 7.62 | 8.0 |
| 3 | Dissolved Oxygen (minimum) | Modified Winkler Method APHA 23 RD Ed.2017 : 2540 C | mg/l | 4.0 | 6.2 | 6.6 | 6.2 | 6.3 | 6.4 | 6.5 | 6.4 |
| 4 | Chloride (max) | Titrimetric Method APHA 23 RD Ed.2017: 4500Cl ⁻ B | mg/l | 600 | 46.8 | 45.3 | 54 | 52 | 16 | 18 | 37.1 |
| 5 | Total Dissolved Solids | Gravimetric Method APHA 23 RD Ed.2017: 2540 C | mg/l | 1500 | 410 | 400 | 388 | 376 | 138 | 162 | 292.8 |
| 6 | BOD (3) days at 27°C (max) | IS 3025(P-44) : 1993 RA 2003 | mg/l | 3.0 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 7 | Arsenic as As | By AAS Method APHA 23 RD Ed.2017: 3114 B | mg/l | 0.2 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 8 | Lead as Pb(max) | By AAS Method APHA 23 RD Ed.2017 3111 B | mg/l | 0.1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 9 | Cadmium as Cd (max) | By AAS Method APHA 23 RD Ed.2017: 3111 B | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 10 | Hexa Chromium as Cr ⁺⁶ | Diphenyl Carbazide Method APHA 23 RD Ed.2017: 3500Cr B | mg/l | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11 | Copper as Cu (max) | By AAS Method APHA 23 RD Ed.2017: 3111 B | mg/l | 1.5 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 12 | Zinc as Zn(max) | By AAS Method APHA 23 RD Ed.2017: 3111 B | mg/l | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 13 | Selenium as Se (max) | By AAS Method APHA 23 RD Ed.2017: 3500 Se C | mg/l | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 14 | Cyanide as CN (max) | Distillation followed by Spectrophotometric Method APHA 23 RD Ed.2017: 4500 CN ⁻ C,D | mg/l | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 15 | Fluoride as F (max) | Distillation followed by Spectrophotometric Method APHA 23 RD Ed.2017: 4500F ⁻ C | mg/l | 1.5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 16 | Sulphates (SO ₄) (max) | Turbidimetric Method APHA 23 RD Ed.2017: 4500 SO ₄ ²⁻ E | mg/l | 400 | 22.9 | 21.4 | 24.2 | 21.6 | 21.5 | 28.2 | 23.4 |
| 17 | Phenolic Compounds as C ₆ H ₅ OH (max) | Chloroform Extraction By Colorimetric Method APHA 23 RD Ed.2017: 5530 B,D | mg/l | 0.005 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 18 | Iron as Fe (max) | By AAS Method APHA 23 RD Ed.2017: 3500Fe, B | mg/l | 0.5 | 0.76 | 0.78 | 0.81 | 0.74 | 0.45 | 0.38 | 0.6 |
| 19 | Nitrate as NO ₃ (max) | By UV-Screen Method APHA 23 RD Ed.2017: 4500 NO ₃ ⁻ E | mg/l | 50 | 8.12 | 8.05 | 8.4 | 8.9 | 13.86 | 12.9 | 10.4 |
| 20 | Anionic Detergents (max) | Anionic Surfactants as MBAS APHA 23 RD Ed.2017: 5540 C | mg/l | 1.0 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 21 | Total Coli form | By Multiple Tube Fermentation Technique APHA 23 RD Ed.2017: 9221 B | MPN/100 ml | 5000 | 1160 | 1180 | 1160 | 1080 | 1100 | 920 | 1088 |
| 22 | Cadmium | By AAS Method APHA 23 RD Ed.2017: 3111 B,C | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 23 | Zinc as Zn | By AAS Method APHA 23 RD Ed.2017: 3111 B,C | mg/l | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 24 | Oil & Grease | By Solvent Extraction Method APHA 23 RD Ed.2017: 5220 B | mg/l | 0.1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 25 | Fecal Coliform | By Multiple Tube Fermentation Technique APHA 23 RD Ed.2017: 9221 E | MPN/100 ml | -- | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 |

Reviewed by: 



Approved by: 



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● Public Health Engineering

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Ref: VCSPL/22/R- 9424

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) SURFACE WATER QUALITY ANALYSIS REPORT

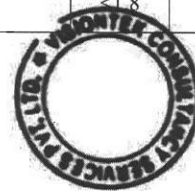
1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : SW3: Reservoir

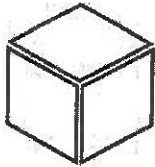
| Sl. No. | Parameter | Testing Methods | Unit | Standards as per IS-2296:1992 Class-'C' | Analysis Results | | | | | | Average | |
|---------|--|---|------------|---|------------------|--------|---------|---------|--------|---------|---------|--------|
| | | | | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | | |
| 1 | Colour (max) | Visual Comparison Method APHA 23 RD Ed,2017: 2120 B, C | Hazen | 300 | SW-3 | SW-3 | SW-3 | SW-3 | SW-3 | SW-3 | <5 | <5 |
| 2 | pH at 25°C | pH Meter APHA 23 RD Ed,2017: 4500H ¹ B | - | 6.0-9.0 | 8.32 | 8.43 | 8.45 | 8.39 | 7.63 | 7.22 | 8.1 | 8.1 |
| 3 | Dissolved Oxygen (minimum) | Modified Winkler Method APHA 23 RD Ed,2017: 2540 C | mg/l | 4.0 | 6.5 | 6.2 | 6.8 | 6.2 | 6.8 | 6.3 | 6.5 | 6.5 |
| 4 | Chloride (max) | Titrimetric Method APHA 23 RD Ed,2017: 4500Cl ¹ B | mg/l | 600 | 23.4 | 21.7 | 20.8 | 21.8 | 24 | 22 | 22.3 | 22.3 |
| 5 | Total Dissolved Solids | Gravimetric Method APHA 23 RD Ed,2017: 2540 C | mg/l | 1500 | 218 | 201 | 212 | 208 | 196 | 188 | 203.8 | 203.8 |
| 6 | BOD (3) days at 27°C (max) | IS 3025(P-44): 1993 RA 2003 | mg/l | 3.0 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 7 | Arsenic as As | By AAS Method APHA 23 RD Ed,2017: 3114 B | mg/l | 0.2 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 8 | Lead as Pb(max) | By AAS Method APHA 23 RD Ed,2017 3111 B | mg/l | 0.1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 9 | Cadmium as Cd (max) | By AAS Method APHA 23 RD Ed,2017: 3111 B | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 10 | Hexa Chromium as Cr ⁺⁶ | Diphenyl Carbazide Method APHA 23 RD Ed,2017: 3500Cr B | mg/l | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 11 | Copper as Cu (max) | By AAS Method APHA 23 RD Ed,2017: 3111 B | mg/l | 1.5 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 12 | Zinc as Zn(max) | By AAS Method APHA 23 RD Ed,2017: 3111 B | mg/l | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 13 | Selenium as Se (max) | By AAS Method APHA 23 RD Ed,2017: 3500 Se C | mg/l | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 14 | Cyanide as CN (max) | Distillation followed by Spectrophotometric Method APHA 23 RD Ed,2017: 4500 CN ¹ C,D | mg/l | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 15 | Fluoride as F (max) | Distillation followed by Spectrophotometric Method APHA 23 RD Ed,2017: 4500F ¹ C | mg/l | 1.5 | 1.28 | 1.38 | 1.44 | 1.32 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Sulphates (SO ₄) (max) | Turbidimetric Method APHA 23 RD Ed,2017: 4500 SO ₄ ²⁻ E | mg/l | 400 | 11.7 | 11.3 | 12.1 | 11.8 | 13.4 | 21.3 | 13.6 | 13.6 |
| 17 | Phenolic Compounds as C ₆ H ₅ OH (max) | Chloroform Extraction By Colorimetric Method APHA 23 RD Ed,2017: 5530 B,D | mg/l | 0.005 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 18 | Iron as Fe (max) | By AAS Method APHA 23 RD Ed,2017: 3500Fe, B | mg/l | 0.5 | 0.34 | 0.37 | 0.38 | 0.31 | 0.09 | 0.12 | 0.27 | 0.27 |
| 19 | Nitrate as NO ₃ (max) | By UV-Screen Method APHA 23 RD Ed,2017: 4500 NO ₃ ⁻ E | mg/l | 50 | 4.10 | 4.03 | 4.12 | 4.6 | 2.81 | 3.4 | 3.84 | 3.84 |
| 20 | Anionic Detergents (max) | Anionic Surfactants as MBAS APHA 23 RD Ed,2017: 5540 C | mg/l | 1.0 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 21 | Total Coli form | By Multiple Tube Fermentation Technique APHA 23 RD Ed,2017: 9221 B | MPN/100 ml | 5000 | 1470 | 1460 | 1470 | 1420 | 920 | 1100 | 1307 | 1307 |
| 22 | Cadmium | By AAS Method APHA 23 RD Ed,2017: 3111 B,C | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 23 | Zinc as Zn | By AAS Method APHA 23 RD Ed,2017: 3111 B,C | mg/l | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 24 | Oil & Grease | By Solvent Extraction Method APHA 23 RD Ed,2017: 5220 B | mg/l | 0.1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 25 | Fecal Coliform | By Multiple Tube Fermentation Technique APHA 23 RD Ed,2017: 9221 E | MPN/100 ml | - | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 |

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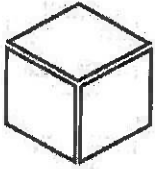
Ref: VCSPL/22/R- 9425

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) DRINKING WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : DW1: Drinking Water from WTP

| Sl. No | Parameter | Method of Testing | Unit of Measurement | Standards as per IS-10500: 2012 | | Analysis Results | | | | | | Average |
|--------|-------------------------------|---|---------------------|---------------------------------|-------------------|------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | | Amended on 2015 & 2018 | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| | | | | Acceptable Limit | Permissible Limit | DW-1 | DW-1 | DW-1 | DW-1 | DW-1 | DW-1 | |
| 01 | Colour | APHA 2120 B; 23 rd Edition, 2017 | Hazen | 5 | 15 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 02 | Odour | APHA 2150 B; 23 rd Edition, 2017 | -- | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 03 | Taste | APHA 2160 C; 23 rd Edition, 2017 | mg/l | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 04 | Turbidity | APHA 2540 D; 23 rd Edition, 2017 | mg/l | 1 | 5 | 3.6 | 3.4 | 3.8 | 3.6 | 3.2 | 23.1 | 6.8 |
| 05 | Total Dissolved Solids as TDS | APHA 2540 C; 23 rd Edition, 2017 | mg/l | 500 | 2000 | 212 | 208 | 218 | 211 | 200 | 186 | 205.8 |
| 06 | pH at 25°C | APHA 4500 H B; 23 rd Edition, 2017 | -- | 6.5 - 8.5 | No Relaxation | 7.59 | 7.68 | 7.62 | 7.58 | 6.81 | 7.43 | 7.45 |
| 07 | Aluminium (as Al) | APHA 3111 C; 23 rd Edition, 2017 | mg/l | 0.5 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 08 | Ammonia (as total ammonia-N) | APHA 4500 NH ₃ C; 23 rd Edition, 2017 | mg/l | 0.2 | -- | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 09 | Anionic Detergents | APHA 5540 C; 23 rd Edition, 2017 | mg/l | 0.2 | 1.0 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 10 | Barium as Ba | APHA 3500 Ba; 23 rd Edition, 2017 | mg/l | 0.7 | No Relaxation | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 11 | Boron as B | APHA 3500 B; 23 rd Edition, 2017 | mg/l | 2.4 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 12 | Calcium as Ca | APHA 3500 Ca.B; 23 rd Edition, 2017 | mg/l | 75 | 200 | 23.2 | 22.1 | 23.4 | 21.8 | 25 | 23.9 | 23.2 |
| 13 | Chloride as Cl | APHA 4500 Cl. B; 23 rd Edition, 2017 | mg/l | 250 | 1000 | 25.4 | 24.5 | 26.6 | 25.4 | 24 | 41 | 27.8 |
| 14 | Copper as Cu | APHA 3111 B,C ; 23 rd Edition, 2017 | mg/l | 0.05 | 1.5 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 15 | Fluoride as F | APHA 4500 F C,D; 23 rd Edition, 2017 | mg/l | 1.0 | 1.5 | 2.64 | 2.76 | 2.82 | 2.66 | <0.01 | 0.47 | 2.27 |
| 16 | Free Residual Chlorine | APHA 4500 Cl. B; 23 rd Edition, 2017 | mg/l | 0.1 | 0.3 | 0.23 | 0.21 | 0.24 | 0.21 | 0.21 | 0.22 | 0.22 |
| 17 | Iron as Fe | APHA 3111 B; 23 rd Edition, 2017 | mg/l | 1 | No Relaxation | 0.25 | 0.24 | 0.28 | 0.24 | 0.49 | 0.47 | 0.33 |
| 18 | Magnesium as Mg | APHA 3500 Mg.B; 23 rd Edition, 2017 | mg/l | 30 | 100 | 7.82 | 8.06 | 8.18 | 8.08 | 8 | 8.5 | 8.11 |
| 19 | Manganese as Mn | APHA 3111 B; ; 23 rd Edition, 2017 | mg/l | 200 | 600 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 20 | Mineral Oil | APHA 5220 B; ; 23 rd Edition, 2017 | mg/l | 0.5 | No Relaxation | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 21 | Nitrate as NO ₃ | APHA 4500 NO ₃ E; ; 23 rd Edition, 2017 | mg/l | 45 | No Relaxation | <1 | <1 | <1 | <1 | 2.72 | 3.84 | 3.28 |
| 22 | Phenolic Compound | APHA 5530B,D; ; 23 rd Edition, 2017 | mg/l | 0.001 | 0.002 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 23 | Selenium as Se | APHA 3114 B; ; 23 rd Edition, 2017 | mg/l | 0.01 | No Relaxation | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 24 | Silver as Ag | APHA 3111 B; ; 23 rd Edition, 2017 | mg/l | 0.1 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 25 | Sulphate as SO ₄ | APHA 4500 SO ₄ E; 23 rd Edition, 2017 | mg/l | 200 | 400 | 32.8 | 33.8 | 34.6 | 31.2 | 36.4 | 28.9 | 33.0 |



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 &
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- Surface & Sub-Surface Investigation
- Quality Control & Project Management
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- Information Technology
- Public Health Engineering

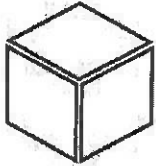
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- Waste Management Services

| | | | | | | | | | | | | |
|----|---------------------------------------|---|-------------|--|---------------|---------|---------|---------|---------|---------|---------|---------|
| 26 | Sulphide | APHA 4500 S ² F; 23 rd Edition, 2017 | mg/l | 0.05 | No Relaxation | 2.2 | 2.1 | 2.4 | 2.2 | 0.04 | <0.05 | 1.8 |
| 27 | Total alkalinity as CaCO ₃ | APHA 2320 B; ; 23 rd Edition, 2017 | mg/l | 0.02 | No Relaxation | 106 | 101 | 108.2 | 106.6 | 108 | 98.2 | 104.7 |
| 28 | Total Hardness | APHA 2340 C; 23 rd Edition, 2017 | mg/l | 200 | 600 | 91.2 | 88 | 90.8 | 91.2 | 96 | 94.7 | 92.0 |
| 29 | Zinc as Zn | APHA 3111 B,C; 23 rd Edition, 2017 | mg/l | 5 | 15 | 2.2 | 2.1 | 2.4 | 2.2 | 2.2 | <0.03 | 2.2 |
| 30 | Cadmium as Cd | APHA 3111 B,C; 23 rd Edition, 2017 | mg/l | 0.003 | No Relaxation | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 31 | Cyanide as CN | APHA 4500 CN ⁻ C,D; 23 rd Edition, 2017 | mg/l | 0.05 | No Relaxation | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 32 | Lead as Pb | APHA 3111 B,C; 23 rd Edition, 2017 | mg/l | 0.01 | No Relaxation | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 33 | Mercury as Hg | APHA 3500 Hg; 23 rd Edition, 2017 | mg/l | 0.001 | No Relaxation | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 34 | Molybdenum as Mo | APHA 3111 D; 23 rd Edition, 2017 | mg/l | 0.07 | No Relaxation | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 35 | Nickel (as Ni) | APHA 3111 B; ; 23 rd Edition, 2017 | mg/l | 0.02 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 36 | Pesticide | APHA 6630 B,C; 23 rd Edition, 2017 | mg/l | - | - | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 37 | Poly aromatic Hydrocarbon as PAH | APHA 6420 B; 23 rd Edition, 2017 | mg/l | 0.0001 | No Relaxation | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| 38 | Arsenic as As | APHA 3114B; ; 23 rd Edition, 2017 | mg/l | 0.01 | 0.05 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 39 | Total Chromium as Cr | APHA 3111 C; 23 rd Edition, 2017 | mg/l | 0.05 | No Relaxation | 0.015 | 0.012 | 0.018 | 0.012 | 0.013 | 0.012 | 0.014 |
| 40 | Total Coliform | APHA 9221 B; 23 rd Edition, 2017 | MPN /100 ml | Shall not be detectable in any 100 ml Sample | - | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 |

Reviewed by:



Approved by:



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Laboratory Services
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 Soil Lab
 Mineral Lab
 &
 Microbiology Lab

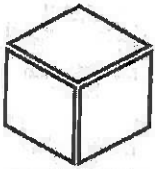
Ref: VCSPL/22/R-9426

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) DRINKING WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
 2. Sampling Location : DW2 : Drinking Water From ARSS

| Sl. No | Parameter | Method of Testing | Unit of Measurement | Standards as per IS-10500: 2012 | | Analysis Results | | | | | | Average |
|--------|-------------------------------|--|---------------------|---------------------------------|-------------------|------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | | Amended on 2015 & 2018 | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| | | | | Acceptable Limit | Permissible Limit | DW-2 | DW-2 | DW-2 | DW-2 | DW-2 | DW-2 | |
| 01 | Colour | APHA 2120 B; 23 rd Edition, 2017 | Hazen | 5 | 15 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 02 | Odour | APHA 2150 B; 23 rd Edition, 2017 | -- | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 03 | Taste | APHA 2160 C; 23 rd Edition, 2017 | mg/l | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 04 | Turbidity | APHA 2540 D; 23 rd Edition, 2017 | mg/l | 1 | 5 | 2.8 | 2.6 | 3.1 | 2.4 | 2.4 | 7.4 | 3.5 |
| 05 | Total Dissolved Solids as TDS | APHA 2540 C; 23 rd Edition, 2017 | mg/l | 500 | 2000 | 238 | 220 | 224 | 218 | 204 | 182 | 214.3 |
| 06 | pH at 25°C | APHA 4500 H'B; 23 rd Edition, 2017 | -- | 6.5 - 8.5 | No Relaxation | 7.72 | 7.75 | 7.81 | 7.74 | 7.53 | 7.53 | 7.7 |
| 07 | Aluminium (as Al) | APHA 3111 C; 23 rd Edition, 2017 | mg/l | 0.5 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 08 | Ammonia (as total ammonia-N) | APHA 4500 NH ₃ C; 23 rd Edition, 2017 | mg/l | 0.2 | -- | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 09 | Anionic Detergents | APHA 5540 C; 23 rd Edition, 2017 | mg/l | 0.2 | 1.0 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 10 | Barium as Ba | APHA 3500 Ba; 23 rd Edition, 2017 | mg/l | 0.7 | No Relaxation | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 11 | Boron as B | APHA 3500 B; 23 rd Edition, 2017 | mg/l | 2.4 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 12 | Calcium as Ca | APHA 3500 Ca.B; 23 rd Edition, 2017 | mg/l | 75 | 200 | 22.6 | 20.7 | 20.8 | 20.6 | 22 | 22.6 | 21.6 |
| 13 | Chloride as Cl | APHA 4500 Cl. B; 23 rd Edition, 2017 | mg/l | 250 | 1000 | 23.4 | 21.7 | 22.4 | 23.2 | 25 | 25 | 23.5 |
| 14 | Copper as Cu | APHA 3111 B,C ; 23 rd Edition, 2017 | mg/l | 0.05 | 1.5 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 15 | Fluoride as F | APHA 4500 F C,D; 23 rd Edition, 2017 | mg/l | 1.0 | 1.5 | 1.11 | 1.14 | 1.24 | 1.18 | 0.26 | 0.49 | 0.90 |
| 16 | Free Residual Chlorine | APHA 4500 Cl. B; 23 rd Edition, 2017 | mg/l | 0.1 | 0.3 | 0.23 | 0.21 | 0.28 | 0.21 | 0.21 | 0.28 | 0.24 |
| 17 | Iron as Fe | APHA 3111 B; 23 rd Edition, 2017 | mg/l | 1 | No Relaxation | 0.1 | 0.11 | 0.16 | 0.18 | 0.05 | 0.49 | 0.18 |
| 18 | Magnesium as Mg | APHA 3500 Mg.B; 23 rd Edition, 2017 | mg/l | 30 | 100 | 8.12 | 8.06 | 8.18 | 8.4 | 10 | 9.4 | 8.69 |
| 19 | Manganese as Mn | APHA 3111 B ; 23 rd Edition, 2017 | mg/l | 200 | 600 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 20 | Mineral Oil | APHA 5220 B ; 23 rd Edition, 2017 | mg/l | 0.5 | No Relaxation | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 21 | Nitrate as NO ₃ | APHA 4500 NO ₃ E ; 23 rd Edition, 2017 | mg/l | 45 | No Relaxation | 2.46 | 2.71 | 2.66 | 3.2 | 2.54 | 4.12 | 2.95 |
| 22 | Phenolic Compound | APHA 5530B.D ; 23 rd Edition, 2017 | mg/l | 0.001 | 0.002 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 23 | Selenium as Se | APHA 3114 B ; 23 rd Edition, 2017 | mg/l | 0.01 | No Relaxation | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 24 | Silver as Ag | APHA 3111 B ; 23 rd Edition, 2017 | mg/l | 0.1 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 25 | Sulphate as SO ₄ | APHA 4500 SO ₄ E ; 23 rd Edition, 2017 | mg/l | 200 | 400 | 29.4 | 28.7 | 30.6 | 30.6 | 32.7 | 34.2 | 31.0 |



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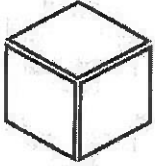
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| | | | | | | | | | | | | |
|----|---------------------------------------|---|-------------|--|---------------|---------|---------|---------|---------|---------|---------|---------|
| 26 | Sulphide | APHA 4500 S ²⁻ F; 23 rd Edition, 2017 | mg/l | 0.05 | No Relaxation | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 27 | Total alkalinity as CaCO ₃ | APHA 2320 B; ; 23 rd Edition, 2017 | mg/l | 0.02 | No Relaxation | 108 | 103 | 110 | 104 | 106 | 96.7 | 104.6 |
| 28 | Total Hardness | APHA 2340 C; 23 rd Edition, 2017 | mg/l | 200 | 600 | 82.2 | 84.6 | 86.4 | 80.2 | 96 | 95.3 | 87.45 |
| 29 | Zinc as Zn | APHA 3111 B,C; 23 rd Edition, 2017 | mg/l | 5 | 15 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 30 | Cadmium as Cd | APHA 3111 B,C; 23 rd Edition, 2017 | mg/l | 0.003 | No Relaxation | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 31 | Cyanide as CN | APHA 4500 CN C,D; 23 rd Edition, 2017 | mg/l | 0.05 | No Relaxation | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 32 | Lead as Pb | APHA 3111 B,C; 23 rd Edition, 2017 | mg/l | 0.01 | No Relaxation | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 33 | Mercury as Hg | APHA 3500 Hg; 23 rd Edition, 2017 | mg/l | 0.001 | No Relaxation | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 34 | Molybdenum as Mo | APHA 3111 D; 23 rd Edition, 2017 | mg/l | 0.07 | No Relaxation | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 35 | Nickel (as Ni) | APHA 3111 B; ; 23 rd Edition, 2017 | mg/l | 0.02 | No Relaxation | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 36 | Pesticide | APHA 6630 B,C; 23 rd Edition, 2017 | mg/l | -- | -- | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 37 | Poly aromatic Hydrocarbon as PAH | APHA 6420 B; ; 23 rd Edition, 2017 | mg/l | 0.0001 | No Relaxation | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| 38 | Arsenic as As | APHA 3114B; ; 23 rd Edition, 2017 | mg/l | 0.01 | 0.05 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| 39 | Total Chromium as Cr | APHA 3111 C; 23 rd Edition, 2017 | mg/l | 0.05 | No Relaxation | 0.032 | 0.031 | 0.034 | 0.029 | 0.031 | 0.028 | 0.03 |
| 40 | Total Coliform | APHA 9221 B; 23 rd Edition, 2017 | MPN /100 ml | Shall not be detectable in any 100 ml Sample | -- | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 |

Reviewed by:



Approved by:



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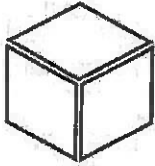
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SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) EFFLUENT WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : EW1 : Stage-I – Collection Tank

| Sl. No. | Parameters | Testing Methods | Unit | Standards (In land Surface water) | Analysis Results | | | | | | Average |
|---------|--|--|-------|--|------------------|----------|----------|----------|----------|----------|----------|
| | | | | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| | | | | | EW-1 | EW-1 | EW-1 | EW-1 | EW-1 | EW-1 | |
| 1 | Colour | Visual Comparison Method APHA 2120 B; 23 rd Edition, 2017 | Hazen | Colourless | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2 | Odour | Threshold Odour Method APHA 2150 B; 23 rd Edition, 2017 | -- | Odourless | Odorless | Odorless | Odorless | Odorless | Odorless | Odorless | Odorless |
| 3 | pH at 25°C | pH Meter APHA 4500 H'B; 23 rd Edition, 2017 | -- | 5.5-9.0 | 8.52 | 8.47 | 8.54 | 8.44 | 7.43 | 7.56 | 8.09 |
| 4 | Total Suspended Solids | Gravimetric Method APHA 2540 D; 23 rd Edition, 2017 | mg/l | 100 | 56.4 | 54.2 | 58.8 | 52.2 | 53.8 | 48.6 | 53.5 |
| 5 | Copper as Cu | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 6 | Fluoride as F | Distillation followed by Spectrophotometric Method APHA 4500 F C,D; 23 rd Edition, 2017 | mg/l | 2 | 1.62 | 1.58 | 1.82 | 1.68 | <0.01 | 0.9 | 1.5 |
| 7 | Total Residual Chlorine | Iodometric Method APHA 23RD Ed,2017 : 4500Cl, B | mg/l | 1 | 0.23 | 0.21 | 0.24 | 0.21 | 0.21 | 0.28 | 0.23 |
| 8 | Iron as Fe | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | 0.21 | 0.18 | 0.22 | 0.18 | 0.43 | 0.58 | 0.32 |
| 9 | Manganese as Mn | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 10 | Nitrate as NO ₃ | By UV-Screen Method APHA 4500 NO ₃ -B; 23 rd Edition, 2017 | mg/l | 10 | 17.4 | 15.5 | 16.2 | 15.8 | 14.7 | 12.6 | 15.0 |
| 11 | Phenolic Compounds as C ₆ H ₅ OH | Distillation Followed by Spectrophotometric Method APHA 5530-B, D; 23 rd Edition, 2017 | mg/l | 1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 12 | Selenium as Se | By AAS Method APHA 3500 Se C; 23 rd Edition, 2017 | mg/l | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 13 | Cadmium as Cd | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 14 | Cyanide as CN | Distillation Followed by Spectrophotometric Method APHA 4500 -CN-C,E; 23 rd Edition, 2017 | mg/l | 0.2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 15 | Lead as Pb | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 0.1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 16 | Mercury as Hg | By AAS Method APHA 3112 B; 23 rd Edition, 2017 | mg/l | 0.01 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 17 | Nickel as Ni | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 18 | Arsenic as As | By AAS Method APHA 3114 B; 23 rd Edition, 2017 | mg/l | 0.2 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 19 | Total Chromium as Cr | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 20 | Zinc as Zn | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 5 | 0.93 | 0.91 | 0.96 | 0.92 | 0.84 | 0.81 | 0.89 |
| 21 | Hexavalent Chromium as Cr ⁶⁺ | By AAS Method APHA 3500 Cr B; 23 rd Edition, 2017 | mg/l | 0.1 | 0.031 | 0.032 | 0.037 | 0.032 | <0.01 | <0.01 | <0.01 |
| 22 | Vanadium as V | By AAS Method APHA 3500 V; 23 rd Edition, 2017 | mg/l | 0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 23 | Temperature | By Thermometer APHA 2550 B; 23 rd Edition, 2017 | °C | Shall not exceed 5°C above the receiving water temperature | 45 | 42 | 38 | 36 | 27.3 | 26.8 | 34.0 |
| 24 | Dissolved Oxygen | Modified Winkler Method APHA 4500 O. C; 23 rd Edition, 2017 | mg/l | - | 6.2 | 6.1 | 6.4 | 6.2 | 6.4 | 5.8 | 6.2 |
| 25 | Biochemical Oxygen Demand as BOD | Oxygen Depletion Method IS 3025 (Part 44):2003 | mg/l | 30 | 9.4 | 9.8 | 8.6 | 9.2 | 13.1 | 3.8 | 8.9 |



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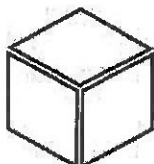
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| | | | | | | | | | | | |
|----|-------------------------------|---|------|--|--|--|--|--|--|--|--|
| 26 | Chemical Oxygen Demand as COD | Open Reflux Method APHA 5220 B; 23 rd Edition, 2017 | mg/l | 250 | 52 | 57 | 54 | 52 | 86 | 18 | 53.4 |
| 27 | Oil & Grease | Gravimetric Method (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017 | mg/l | 10 | 1.3 | 1 | 1.2 | 1.8 | 1.8 | 1.9 | 1.5 |
| 28 | Ammonical Nitrogen as N | By TKN Method APHA 4500-NH ₃ C; 23 rd Edition, 2017 | mg/l | 50 | <0.1 | <0.1 | <0.1 | <0.1 | 0.6 | 1.15 | 0.9 |
| 29 | Total Kjeldahl Nitrogen as N | By TKN Method APHA 4500-N _{org} C; 23 rd Edition, 2017 | mg/l | 100 | 10.3 | 10.6 | 11.8 | 12.4 | 11.8 | 10.9 | 11.5 |
| 30 | Sulphide as S | By Methylene Blue Method APHA 4500-S D; 23 rd Edition, 2017 | mg/l | 2 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 33 | Bio-assay Test | Evaluating Acute Toxicity IS 6582 (P-2) 2008 | % | 90% survival of fish after 96 hours in 100% effluent | 98% Survival of Fish after 96 Hrs in 100% Effluent | 98% Survival of Fish after 96 Hrs in 100% Effluent | 96% Survival of Fish after 96 Hrs in 100% Effluent | 94% Survival of Fish after 96 Hrs in 100% Effluent | 94% Survival of Fish after 96 Hrs in 100% Effluent | 91% Survival of Fish after 96 Hrs in 100% Effluent | 91% Survival of Fish after 96 Hrs in 100% Effluent |
| 32 | Free Ammonia | By Calculation | mg/l | 5.0 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 33 | Dissolved Phosphate | Stannous Chloride Method APHA 4500-P D; 23 rd Edition, 2017 | mg/l | 5.0 | 0.62 | 0.64 | 0.68 | 0.59 | <0.01 | 0.07 | 0.495 |
| 34 | Particle Size of SS | Gravimetric Method APHA 2540 D; 23 rd Edition, 2017 | μ | Shall pass 850 | <850 | <850 | <850 | <850 | <850 | <850 | <850 |

B. S. P.
Reviewed by



F. J. M.
Approved by



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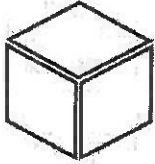
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Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) EFFLUENT WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
 2. Sampling Location : EW2 : Stage-I I- Clarifier Flocculator

| Sl. No. | Parameters | Testing Methods | Unit | Standards (In land Surface water) | Analysis Results | | | | | | Average |
|---------|--|--|-------|--|------------------|----------|----------|----------|----------|----------|----------|
| | | | | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| | | | | | EW-2 | EW-2 | EW-2 | EW-2 | EW-2 | EW-2 | |
| 1 | Colour | Visual Comparison Method APHA 2120 B; 23 rd Edition, 2017 | Hazen | Colourless | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2 | Odour | Threshold Odour Method APHA 2150 B; 23 rd Edition, 2017 | -- | Odourless | Odorless | Odorless | Odorless | Odorless | Odorless | Odorless | Odorless |
| 3 | pH at 25°C | pH Meter APHA 4500 H' B; 23 rd Edition, 2017 | -- | 5.5-9.0 | 8.31 | 8.38 | 8.41 | 8.39 | 6.66 | 7.54 | 7.9 |
| 4 | Total Suspended Solids | Gravimetric Method APHA 2540 D; 23 rd Edition, 2017 | mg/l | 100 | 36 | 34 | 38 | 32 | 38 | 32.3 | 34.9 |
| 5 | Copper as Cu | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 6 | Fluoride as F | Distillation followed by Spectrophotometric Method APHA 4500 F' C,D; 23 rd Edition, 2017 | mg/l | 2 | 1.31 | 1.38 | 1.44 | 1.39 | 0.77 | 0.91 | 1.18 |
| 7 | Total Residual Chlorine | Iodometric Method APHA 23RD Ed, 2017 : 4500Cl, B | mg/l | 1 | 0.24 | 0.26 | 0.28 | 0.26 | 0.24 | 0.22 | 0.25 |
| 8 | Iron as Fe | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | 0.26 | 0.24 | 0.26 | 0.21 | 0.54 | 0.46 | 0.34 |
| 9 | Manganese as Mn | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.03 | <0.03 |
| 10 | Nitrate as NO ₃ | By UV-Screen Method APHA 4500 NO ₃ B; 23 rd Edition, 2017 | mg/l | 10 | 45.02 | 44.08 | 4.82 | 4.74 | 2.34 | 2.84 | 11.8 |
| 11 | Phenolic Compounds as C ₆ H ₅ OH | Distillation Followed by Spectrophotometric Method APHA 5530-B, D; 23 rd Edition, 2017 | mg/l | 1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 12 | Selenium as Se | By AAS Method APHA 3500 Se C; 23 rd Edition, 2017 | mg/l | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 13 | Cadmium as Cd | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2.0 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 14 | Cyanide as CN | Distillation Followed by Spectrophotometric Method APHA 4500 -CN-C, E; 23 rd Edition, 2017 | mg/l | 0.2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 15 | Lead as Pb | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 0.1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 16 | Mercury as Hg | By AAS Method APHA 3112 B; 23 rd Edition, 2017 | mg/l | 0.01 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 17 | Nickel as Ni | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 18 | Arsenic as As | By AAS Method APHA 3114 B; 23 rd Edition, 2017 | mg/l | 0.2 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 19 | Total Chromium as Cr | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 20 | Zinc as Zn | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 5 | 0.66 | 0.68 | 0.74 | 0.71 | 0.71 | 0.73 | 0.71 |
| 21 | Hexavalent Chromium as Cr ⁶⁺ | By AAS Method APHA 3500 Cr B; 23 rd Edition, 2017 | mg/l | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 22 | Vanadium as V | By AAS Method APHA 3500 V; 23 rd Edition, 2017 | mg/l | 0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 23 | Temperature | By Thermometer APHA 2550 B; 23 rd Edition, 2017 | °C | Shall not exceed 5°C above the receiving water temperature | 45 | 42 | 38 | 36 | 26.8 | 27.1 | 34.0 |
| 24 | Dissolved Oxygen | Modified Winkler Method APHA 4500 O, C; 23 rd Edition, 2017 | mg/l | -- | 6.1 | 6.2 | 6.8 | 6.2 | 6.2 | 6.1 | 6.3 |
| 25 | Biochemical Oxygen Demand as BOD | Oxygen Depletion Method IS 3025 (Part 44):2003 | mg/l | 30 | 7.4 | 7.8 | 7.2 | 6.3 | 6.4 | 2.8 | 6.1 |
| 26 | Chemical Oxygen Demand as COD | Open Reflux Method APHA 5220 B; 23 rd Edition, 2017 | mg/l | 250 | 46.2 | 48.4 | 46.2 | 41.8 | 77 | 9.0 | 44.5 |



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- Mineral/Sub-Soil Exploration
- Waste Management Services

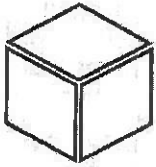
| | | | | | | | | | | | |
|----|------------------------------|---|------|--|--|--|--|--|--|--|--|
| 27 | Oil & Grease | Gravimetric Method (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017 | mg/l | 10 | 1.2 | 1.4 | 1.8 | 1.6 | 1.7 | 1.4 | 1.6 |
| 28 | Ammonical Nitrogen as N | By TKN Method APHA 4500-NH ₃ C; 23 rd Edition, 2017 | mg/l | 50 | 0.53 | 0.54 | 0.56 | 0.4 | 0.6 | 0.6 | 0.5 |
| 29 | Total Kjeldahl Nitrogen as N | By TKN Method APHA 4500-N _{org} C; 23 rd Edition, 2017 | mg/l | 100 | 1.87 | 1.9 | 1.8 | 1.62 | 1.65 | 2.3 | 1.9 |
| 30 | Sulphide as S | By Methylene Blue Method APHA 4500-S D; 23 rd Edition, 2017 | mg/l | 2 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 33 | Bio-assay Test | Evaluating Acute Toxicity IS 6582 (P-2) 2008 | % | 90% survival of fish after 96 hours in 100% effluent | 96% Survival of Fish after 96 Hrs in 100% Effluent | 96% Survival of Fish after 96 Hrs in 100% Effluent | 98% Survival of Fish after 96 Hrs in 100% Effluent | 96% Survival of Fish after 96 Hrs in 100% Effluent | 96% Survival of Fish after 96 Hrs in 100% Effluent | 92% Survival of Fish after 96 Hrs in 100% Effluent | 92% Survival of Fish after 96 Hrs in 100% Effluent |
| 32 | Free Ammonia | By Calculation | mg/l | 5.0 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 33 | Dissolved Phosphate | Stannous Chloride Method APHA 4500-P D; 23 rd Edition, 2017 | mg/l | 5.0 | 5.6 | 5.8 | 6.2 | 6.8 | 6.8 | 0.1 | 5.14 |
| 34 | Particle Size of SS | Gravimetric Method APHA 2540 D; 23 rd Edition, 2017 | μ | Shall pass 850 | <850 | <850 | <850 | <850 | <850 | <850 | <850 |

Reviewed by:



Approved by:





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Accredited by : NABET-A Grade, MOEF & CC/CPCB & SPCB-A Grade

Laboratory Services
 Environment Lab
 Food Lab
 Material Lab
 Soil Lab
 Mineral Lab
 &
 Microbiology Lab

• Infrastructure Engineering
 • Water Resource Management
 • Environmental & Social Study

• Surface & Sub-Surface Investigation
 • Quality Control & Project Management
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• Agricultural Development
 • Information Technology
 • Public Health Engineering

• Mine Planning & Design
 • Mineral/Sub-Soil Exploration
 • Waste Management Services

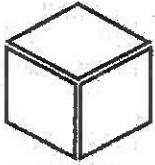
Ref: VCSPL/22/R- 9429

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) EFFLUENT WATER QUALITY ANALYSIS REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
 2. Sampling Location : EW3 : Stage-III- Treated Water

| Sl. No. | Parameters | Testing Methods | Unit | Standards (In land Surface water) | Analysis Results | | | | | | Average |
|---------|--|---|-------|--|------------------|----------|----------|----------|----------|----------|----------|
| | | | | | APRIL-22 | MAY-22 | JUNE-22 | JULY-22 | AUG-22 | SEPT-22 | |
| | | | | | EW-3 | EW-3 | EW-3 | EW-3 | EW-3 | EW-3 | |
| 1 | Colour | Visual Comparison Method APHA 2120 B; 23 rd Edition, 2017 | Hazen | Colourless | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2 | Odour | Threshold Odour Method APHA 2150 B; 23 rd Edition, 2017 | -- | Odourless | Odorless | Odorless | Odorless | Odorless | Odorless | Odorless | Odorless |
| 3 | pH at 25°C | pH Meter APHA 4500 H ⁺ B; 23 rd Edition, 2017 | -- | 5.5-9.0 | 8.26 | 8.33 | 8.39 | 8.24 | 6.83 | 7.51 | 7.9 |
| 4 | Total Suspended Solids | Gravimetric Method APHA 2540 D; 23 rd Edition, 2017 | mg/l | 100 | 22.8 | 22.6 | 24.2 | 23.2 | 25.6 | 25.7 | 24.0 |
| 5 | Copper as Cu | By AAS Method APHA 3113 B; 23 rd Edition, 2017 | mg/l | 3 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 6 | Fluoride as F | Distillation followed by Spectrophotometric Method APHA 4500 F C,D; 23 rd Edition, 2017 | mg/l | 2 | 1.63 | 1.67 | 1.74 | 1.66 | 0.51 | 0.86 | 1.35 |
| 7 | Total Residual Chlorine | Iodometric Method APHA 23RD Ed.2017 : 4500Cl ₂ B | mg/l | 1 | 0.24 | 0.21 | 0.24 | 0.22 | 0.25 | 0.21 | 0.23 |
| 8 | Iron as Fe | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | <0.01 | <0.01 | <0.01 | <0.01 | 0.31 | 0.38 | 0.35 |
| 9 | Manganese as Mn | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.03 | <0.03 |
| 10 | Nitrate as NO ₃ | By UV-Screen Method APHA 4500 NO ₃ ⁻ B; 23 rd Edition, 2017 | mg/l | 10 | 16.4 | 16.3 | 16.44 | 15.8 | 16.2 | 2.16 | 13.9 |
| 11 | Phenolic Compounds as C ₆ H ₅ OH | Distillation Followed by Spectrophotometric Method APHA 5530-B, D; 23 rd Edition, 2017 | mg/l | 1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 12 | Selenium as Se | By AAS Method APHA 3500 Se C; 23 rd Edition, 2017 | mg/l | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 13 | Cadmium as Cd | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2.0 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 14 | Cyanide as CN | Distillation Followed by Spectrophotometric Method APHA 4500 -CN-C,E; 23 rd Edition, 2017 | mg/l | 0.2 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 15 | Lead as Pb | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 0.1 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 16 | Mercury as Hg | By AAS Method APHA 3112 B; 23 rd Edition, 2017 | mg/l | 0.01 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 17 | Nickel as Ni | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 18 | Arsenic as As | By AAS Method APHA 3114 B; 23 rd Edition, 2017 | mg/l | 0.2 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| 19 | Total Chromium as Cr | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 20 | Zinc as Zn | By AAS Method APHA 3111 B; 23 rd Edition, 2017 | mg/l | 5 | 0.87 | 0.88 | 0.83 | 0.82 | 0.82 | 0.48 | 0.78 |
| 21 | Hexavalent Chromium as Cr ⁶⁺ | By AAS Method APHA 3500 Cr B; 23 rd Edition, 2017 | mg/l | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 22 | Vanadium as V | By AAS Method APHA 3500 V; 23 rd Edition, 2017 | mg/l | 0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 23 | Temperature | By Thermometer APHA 2550 B; 23 rd Edition, 2017 | °C | Shall not exceed 5°C above the receiving water temperature | 43 | 42 | 38 | 36 | 26.8 | 26.3 | 35.4 |
| 24 | Dissolved Oxygen | Modified Winkler Method APHA 4500 O. C; 23 rd Edition, 2017 | mg/l | -- | 5.9 | 6.1 | 5.9 | 6.2 | 6.8 | 4.8 | 6.0 |
| 25 | Biochemical Oxygen Demand as BOD | Oxygen Depletion Method IS 3025 (Part 44):2003 | mg/l | 30 | 12.3 | 12.6 | 11.8 | 11.2 | 13.4 | 1.8 | 10.5 |
| 26 | Chemical Oxygen Demand as COD | Open Reflux Method APHA 5220 B; 23 rd Edition, 2017 | mg/l | 250 | 73.2 | 72.6 | 71.4 | 68.2 | 62 | 4 | 58.6 |
| 27 | Oil & Grease | Gravimetric Method | mg/l | 10 | 1.2 | 1.4 | 1.2 | 1.4 | 1.6 | 1 | 1.3 |



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- Quality Control & Project Management
- Renewable Energy

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- Information Technology
- Public Health Engineering

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- Mineral/Sub-Soil Exploration
- Waste Management Services

| | | | | | | | | | | | |
|----|------------------------------|---|------|--|--|--|--|--|--|--|--|
| | | (Solvent Extraction) APHA 5520 B; 23 rd Edition, 2017 | | | | | | | | | |
| 28 | Ammonical Nitrogen as N | By TKN Method APHA 4500-NH ₃ C; 23rd Edition, 2017 | mg/l | 50 | <0.1 | <0.1 | <0.1 | <0.1 | 1.8 | 0.58 | 1.19 |
| 29 | Total Kjeldahl Nitrogen as N | By TKN Method APHA 4500-N _{org} C; 23rd Edition, 2017 | mg/l | 100 | 1.24 | 1.32 | 1.34 | 1.44 | 1.61 | 1.85 | 1.47 |
| 30 | Sulphide as S | By Methylene Blue Method APHA 4500-S D; 23rd Edition; 2017 | mg/l | 2 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 33 | Bio-assay Test | Evaluating Acute Toxicity IS 6582 (P-2) 2008 | % | 90% survival of fish after 96 hours in 100% effluent | 98% Survival of Fish after 96 Hrs in 100% Effluent | 98% Survival of Fish after 96 Hrs in 100% Effluent | 96% Survival of Fish after 96 Hrs in 100% Effluent | 94% Survival of Fish after 96 Hrs in 100% Effluent | 94% Survival of Fish after 96 Hrs in 100% Effluent | 94% Survival of Fish after 96 Hrs in 100% Effluent | 94% Survival of Fish after 96 Hrs in 100% Effluent |
| 32 | Free Ammonia | By Calculation | mg/l | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 33 | Dissolved Phosphate | Stannous Chloride Method APHA 4500-P D; 23rd Edition, 2017 | mg/l | 5.0 | 0.36 | 0.39 | 0.41 | 0.44 | <0.01 | 0.25 | 0.37 |
| 34 | Particle Size of SS | Gravimetric Method APHA 2540 D; 23 rd Edition, 2017 | μ | Shall pass 850 | <850 | <850 | <850 | <850 | <850 | <850 | <850 |

Reviewed by:

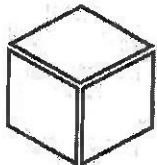


Approved by:

TATA STEEL FOUNDATION, GOPALPUR
FY'23 Budget V17

Upto Sept'22

| Vertical | GL internal fund | Cost Description (Programmes) | BUDGET | | | Expenses |
|---------------------------------------|------------------|--|----------------|--------------|-------------|---------------|
| | | | Budget A | Budget B | Budget C | Budget A |
| PUBLIC HEALTH | 5020502 | RISHTA | 17.00 | | | 0.20 |
| PUBLIC HEALTH | 5020003 | Healthcare infrastructure | 20.10 | | | 3.58 |
| PUBLIC HEALTH | 5020006 | Cataract | 2.50 | | | |
| PUBLIC HEALTH | 5020010 | Mobile Medical Units and ambulances | 3.11 | | | |
| PUBLIC HEALTH | 5020021 | Kitchen Garden | 66.74 | | | |
| PUBLIC HEALTH | 5020024 | BCC and Health Promotion (Public Health) | 1.00 | | | 0.11 |
| PUBLIC HEALTH | 5020026 | Public Health Interventions in Proximate areas (Previous | 100.00 | | | 0.03 |
| PUBLIC HEALTH | | Sub Total | 210.46 | 0.00 | 0.00 | 3.92 |
| EDUCATION | 5050002 | Fellowship programme | 16.77 | | | 0.94 |
| EDUCATION | 5050005 | Support for Schools/Institutions (educational infrastru | 19.07 | | | 19.07 |
| EDUCATION | 5050008 | Learning Support Program | 12.00 | | | 3.32 |
| EDUCATION | | Sub Total | 47.84 | 0.00 | 0.00 | 23.34 |
| LIVELIHOODS (AGRICU | 5030001 | Water Harvesting structures (ponds) | 60.98 | | | 12.24 |
| LIVELIHOODS (AGRICU | 5030002 | Agriculture Activities (SRI and dryland farming) | 30.00 | | | 10.07 |
| LIVELIHOODS (AGRICU | 5030003 | Promote second crops | 25.00 | | | |
| LIVELIHOODS (AGRICU | 5030004 | Livelihood Agri allied, Livo, Diary, Poultry | 25.00 | | | 0.20 |
| LIVELIHOODS (AGRICU | 5030005 | Capacity Building of Farmers Institutions | 15.08 | | | 0.08 |
| LIVELIHOODS (AGRICU | 5030006 | Agri resource centres, training and info. centres. | 6.00 | | | |
| LIVELIHOODS (AGRICU | 5030007 | Enterprise Development Programmes | 44.46 | | | 4.13 |
| LIVELIHOODS (AGRICU | 5030021 | Livelihood Infrastructure | 20.00 | | | |
| LIVELIHOODS (AGRICULTURE) | | Sub Total | 226.52 | 0.00 | 0.00 | 26.71 |
| LIVELIHOODS (Empow | 5060001 | Women Empowerment Programmes | 3.89 | | | 3.19 |
| LIVELIHOODS (Empow | 5060002 | Business Development of SHGs | 22.00 | 11.11 | | 7.04 |
| LIVELIHOODS (Empowerment) | | Sub Total | 25.89 | 11.11 | 0.00 | 10.23 |
| LIVELIHOODS (SKILL D | 5040001 | Sponsorship to Trainees for various vocational courses | 15.00 | | | |
| LIVELIHOODS (SKILL D | 5040002 | Skill Development Programmes (short term courses link | 24.20 | | | 0.05 |
| LIVELIHOODS (SKILL D | 5040008 | Support girls in Nursing training TCS | 8.70 | | | |
| LIVELIHOODS (SKILL D | 5040014 | JN Tata Technical Education Center Gopalpur | 300.00 | | | |
| LIVELIHOODS (SKILL DEVELOPM | | Sub Total | 347.90 | 0.00 | 0.00 | 0.05 |
| SPORTS | 5100002 | Support to Sportsmen | 0.00 | | | |
| SPORTS | 5100005 | Organising sports tournaments and coaching camps | 3.58 | | | 2.25 |
| SPORTS | 5100007 | Running Sports Centres | 9.00 | | | |
| SPORTS | 5100009 | Organising outdoor and leadership camps | 15.00 | | | |
| SPORTS | | Sub Total | 27.58 | 0.00 | 0.00 | 2.25 |
| ENVIRONMENT | 5070001 | Plantation | 2.50 | | | 1.98 |
| ENVIRONMENT | 5070003 | Renewable Energy (Solar Light) | 18.00 | | | |
| ENVIRONMENT | 5070004 | Protection of flora and fauna | 50.00 | | | 1.35 |
| ENVIRONMENT | | Sub Total | 70.50 | 0.00 | 0.00 | 3.33 |
| RURAL INFRASTRUCTURE | 5130001 | Infrastructural support for Rural Development | 43.76 | | | 20.22 |
| RURAL INFRASTRUCTURE & URB | | Sub Total | 43.76 | 0.00 | 0.00 | 20.22 |
| DRINKING WATER | 5010003 | Installation of piped drinking water supply system | 43.76 | | | 19.77 |
| DRINKING WATER | 5010004 | Installation and repair of deep bores | 12.14 | | | 8.21 |
| DRINKING WATER | 5010005 | Installation and repair of hand tube wells | 2.38 | | | 0.30 |
| DRINKING WATER | | Sub Total | 58.29 | 0.00 | 0.00 | 28.29 |
| | 5140022 | Employee Volunteerism | 1.00 | | | |
| SPECIAL COMMITMENTS | 5020020 | Gopalpur hospital (Medica) – Odisha | 100.00 | | | |
| SPECIAL COMMITMENTS | | Sub Total | 100.00 | 0.00 | 0.00 | 0.00 |
| HR PROJECT COST | Separate | HR cost (Salary) | 150.25 | | | 60.83 |
| HR PROJECT COST | Separate | Administrative expenses TSRDS | 0.05 | | | |
| HR PROJECT COST | Separate | Administrative expenses TSF | 29.85 | | | 7.00 |
| HR PROJECT COST | Separate | HR Overheads Cost | 1.98 | | | |
| HR PROJECT COST | Separate | Capital Items | 0.00 | | | |
| HR PROJECT COST | 5140204 | Safety | 1.00 | | | 0.10 |
| HR PROJECT COST | 5140021 | IT expenses | 2.00 | | | |
| HR PROJECT COST | | Sub Total | 185.13 | 0.00 | 0.00 | 67.93 |
| Combat COVID-19 initiatives | 5020019 | Others | 3.26 | | | 3.26 |
| COMBAT COVID INITIATIVES | | Sub Total | 3.26 | 0.00 | 0.00 | 3.26 |
| | | GRAND TOTAL | 1348.12 | 11.11 | 0.00 | 189.52 |



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- Renewable Energy

- Agricultural Development
- Information Technology
- Public Health Engineering

- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

Ref: VCSPL/22/R- 9415

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) AMBIENT AIR QUALITY MONITORING REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : AAQMS-1 : MRSS Building Roof
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

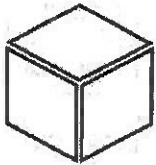
| Date | PARAMETERS | | | | | | | | | | | |
|--------------------|--|---|---|---|--|----------------------------|---|---|--|----------------------------|----------------------------|----------------------------|
| | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | SO ₂ (µg/m ³) | NO _x (µg/m ³) | O ₃ (µg/m ³) | CO (mg/m ³) | NH ₃ (µg/m ³) | C ₆ H ₆ (µg/m ³) | BaP (ng/m ³) | Ni (ng/m ³) | Pb (µg/m ³) | As (ng/m ³) |
| Apr-22 | 71.2 | 44.3 | 15.8 | 17.9 | BDL | 0.78 | BDL | BDL | BDL | BDL | BDL | BDL |
| May-22 | 70.8 | 42.5 | 16.0 | 17.7 | BDL | 0.88 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jun-22 | 73.5 | 44.1 | 16.6 | 18.1 | BDL | 0.84 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jul-22 | 63.8 | 38.3 | 13.3 | 15.7 | BDL | 0.48 | BDL | BDL | BDL | BDL | BDL | BDL |
| Aug-22 | 61.6 | 37.9 | 13.6 | 15.7 | BDL | 0.5 | BDL | BDL | BDL | BDL | BDL | BDL |
| Sep-22 | 62.3 | 35.7 | 13.9 | 17.8 | BDL | 0.5 | BDL | BDL | BDL | BDL | BDL | BDL |
| Six Months Average | 67.2 | 40.5 | 14.9 | 17.2 | BDL | 0.7 | BDL | BDL | BDL | BDL | BDL | BDL |
| NAAQ Standard | 100 | 60 | 80 | 80 | 180 | 4 | 400 | 5 | 1 | 20 | 1 | 6 |
| Testing method | Gravimetric | Gravimetric | Improved West and Gaeke method | Modified Jacob & Hochheiser (Na-Arsenite) | Chemical Method | NDIR Spectroscopy | Indo phenol blue method | Absorption & Desorption followed by GC analysis | Solvent extraction followed by Gas Chromatography analysis | AAS method after sampling | AAS method after sampling | AAS method after sampling |

BDL Values: PM₁₀<20 µg/m³, PM_{2.5}<10 µg/m³, SO₂< 4 µg/m³, NO_x< 6 µg/m³, O₃<4 µg/m³, CO<0.1 mg/m³, NH₃<20 µg/m³, C₆H₆<4 µg/m³, BaP<0.5 ng/m³, Ni<2.5 ng/m³, Pb<0.02µg/m³, As < 1 ng/m³.

Reviewed by:



Approved by:



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● Renewable Energy

● Agricultural Development
● Information Technology
● Public Health Engineering

● Mine Planning & Design
● Mineral/Sub-Soil Exploration
● Waste Management Services

Ref: VCSPL/22/R-9416

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) AMBIENT AIR QUALITY MONITORING REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : AAQMS-2 : LBSS Building Roof
3. Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

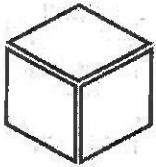
| Date | PARAMETERS | | | | | | | | | | | |
|--------------------|--|---|---|---|--|----------------------------|---|---|--|----------------------------|----------------------------|----------------------------|
| | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | SO ₂ (µg/m ³) | NO _x (µg/m ³) | O ₃ (µg/m ³) | CO (mg/m ³) | NH ₃ (µg/m ³) | C ₆ H ₆ (µg/m ³) | BaP (ng/m ³) | Ni (ng/m ³) | Pb (µg/m ³) | As (ng/m ³) |
| Apr-22 | 73.2 | 43.2 | 9.8 | 17.1 | BDL | 0.76 | BDL | BDL | BDL | BDL | BDL | BDL |
| May-22 | 74.3 | 44.6 | 9.5 | 16.7 | BDL | 0.82 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jun-22 | 78.1 | 46.9 | 9.7 | 17.6 | BDL | 0.88 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jul-22 | 63.5 | 38.1 | 9.0 | 11.6 | BDL | 0.64 | BDL | BDL | BDL | BDL | BDL | BDL |
| Aug-22 | 62.4 | 38.5 | 9.3 | 12.1 | BDL | 0.60 | BDL | BDL | BDL | BDL | BDL | BDL |
| Sep-22 | 63.2 | 35.2 | 9.5 | 13.8 | BDL | 0.60 | BDL | BDL | BDL | BDL | BDL | BDL |
| Six Months Average | 69.1 | 41.1 | 9.5 | 14.8 | BDL | 0.7 | BDL | BDL | BDL | BDL | BDL | BDL |
| NAAQ Standard | 100 | 60 | 80 | 80 | 180 | 4 | 400 | 5 | 1 | 20 | 1 | 6 |
| Testing method | Gravimetric | Gravimetric | Improved West and Gaeke method | Modified Jacob & Hochheiser (Na-Arsenite) | Chemical Method | NDIR Spectroscopy | Indo phenol blue method | Absorption & Desorption followed by GC analysis | Solvent extraction followed by Gas Chromatography analysis | AAS method after sampling | AAS method after sampling | AAS method after sampling |

BDL Values: PM₁₀<20 µg/m³, PM_{2.5}<10 µg/m³, SO₂<4 µg/m³, NO_x<6 µg/m³, O₃<4 µg/m³, CO<0.1 mg/m³, NH₃<20 µg/m³, C₆H₆<4 µg/m³, BaP<0.5 ng/m³, Ni<2.5 ng/m³, Pb<0.02µg/m³, As < 1 ng/m³.

Reviewed by:



Approved by:



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Ref: VCSPL/22/R-9417



Date: 28.11.2022


SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) AMBIENT AIR QUALITY MONITORING REPORT

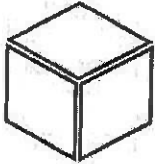
1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
 2. Sampling Location : AAQMS-3 : Canteen Building Roof
 3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

| Date | PARAMETERS | | | | | | | | | | | |
|--------------------|--|---|---|---|--|----------------------------|---|---|--|----------------------------|----------------------------|----------------------------|
| | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | SO ₂ (µg/m ³) | NO _x (µg/m ³) | O ₃ (µg/m ³) | CO (mg/m ³) | NH ₃ (µg/m ³) | C ₆ H ₆ (µg/m ³) | BaP (ng/m ³) | Ni (ng/m ³) | Pb (µg/m ³) | As (ng/m ³) |
| Apr-22 | 72.5 | 44.1 | 12.5 | 16.8 | BDL | 0.76 | BDL | BDL | BDL | BDL | BDL | BDL |
| May-22 | 73.4 | 44.0 | 11.0 | 16.0 | BDL | 0.72 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jun-22 | 76.3 | 45.8 | 12.7 | 17.9 | BDL | 0.86 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jul-22 | 62.4 | 37.5 | 10.6 | 14.1 | BDL | 0.6 | BDL | BDL | BDL | BDL | BDL | BDL |
| Aug-22 | 61.9 | 37.7 | 10.6 | 13.9 | BDL | 0.6 | BDL | BDL | BDL | BDL | BDL | BDL |
| Sep-22 | 59.6 | 33.6 | 11.2 | 16.0 | BDL | 0.6 | BDL | BDL | BDL | BDL | BDL | BDL |
| Six Months Average | 67.7 | 40.5 | 11.4 | 15.8 | BDL | 0.7 | BDL | BDL | BDL | BDL | BDL | BDL |
| NAAQ Standard | 100 | 60 | 80 | 80 | 180 | 4 | 400 | 5 | 1 | 20 | 1 | 6 |
| Testing method | Gravimetric | Gravimetric | Improved West and Gaeke method | Modified Jacob & Hochheiser (Na-Arsenite) | Chemical Method | NDIR Spectroscopy | Indo phenol blue method | Absorption & Desorption followed by GC analysis | Solvent extraction followed by Gas Chromatography analysis | AAS method after sampling | AAS method after sampling | AAS method after sampling |

BDL Values: PM₁₀<20 µg/m³, PM_{2.5}<10 µg/m³, SO₂< 4 µg/m³, NO_x< 6 µg/m³, O₃<4 µg/m³, CO<0.1 mg/m³, NH₃<20 µg/m³, C₆H₆<4 µg/m³, BaP<0.5 ng/m³, Ni<2.5 ng/m³, Pb<0.02µg/m³, As < 1 ng/m³.

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Ref: VCSPL/22/R-9418

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) AMBIENT AIR QUALITY MONITORING REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Sampling Location : AAQMS-4 : ETP Building Roof
3. Monitoring Instruments: RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Monitor, VOC Sampler

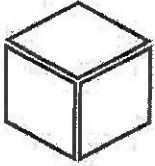
| Date | PARAMETERS | | | | | | | | | | | |
|--------------------|--|---|---|---|--|----------------------------|---|---|--|----------------------------|----------------------------|----------------------------|
| | PM ₁₀ (µg/m ³) | PM _{2.5} (µg/m ³) | SO ₂ (µg/m ³) | NO _x (µg/m ³) | O ₃ (µg/m ³) | CO (mg/m ³) | NH ₃ (µg/m ³) | C ₆ H ₆ (µg/m ³) | BaP (ng/m ³) | Ni (ng/m ³) | Pb (µg/m ³) | As (ng/m ³) |
| Apr-22 | 72.7 | 42.1 | 13.6 | 17.9 | BDL | 0.83 | BDL | BDL | BDL | BDL | BDL | BDL |
| May-22 | 73.5 | 44.1 | 13.2 | 18.7 | BDL | 0.81 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jun-22 | 74.8 | 44.9 | 14.5 | 18.8 | BDL | 0.86 | BDL | BDL | BDL | BDL | BDL | BDL |
| Jul-22 | 61.7 | 37.0 | 11.3 | 16.0 | BDL | 0.64 | BDL | BDL | BDL | BDL | BDL | BDL |
| Aug-22 | 62.6 | 37.9 | 11.3 | 15.7 | BDL | 0.6 | BDL | BDL | BDL | BDL | BDL | BDL |
| Sep-22 | 61.7 | 34.7 | 11.4 | 17.3 | BDL | 0.6 | BDL | BDL | BDL | BDL | BDL | BDL |
| Six Months Average | 67.8 | 40.1 | 12.6 | 17.4 | BDL | 0.7 | BDL | BDL | BDL | BDL | BDL | BDL |
| NAAQ Standard | 100 | 60 | 80 | 80 | 180 | 4 | 400 | 5 | 1 | 20 | 1 | 6 |
| Testing method | Gravimetric | Gravimetric | Improved West and Gaeke method | Modified Jacob & Hochheiser (Na-Arsenite) | Chemical Method | NDIR Spectroscopy | Indo phenol blue method | Absorption & Desorption followed by GC analysis | Solvent extraction followed by Gas Chromatography analysis | AAS method after sampling | AAS method after sampling | AAS method after sampling |

BDL Values: PM₁₀<20 µg/m³, PM_{2.5}<10 µg/m³, SO₂<4 µg/m³, NO_x<6 µg/m³, O₃<4 µg/m³, CO<0.1 mg/m³, NH₃<20 µg/m³, C₆H₆<4 µg/m³, BaP<0.5 ng/m³, Ni<2.5 ng/m³, Pb<0.02µg/m³, As <1 ng/m³.

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Ref: VCSPL/22/R- 9419

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) FUGITIVE EMISSION MONITORING REPORT

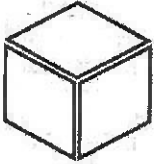
1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
 2. Monitoring Instruments : RDS (APM 460 BL)

| Sampling Location | Parameter | | | | | | Average |
|-------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------|
| | APRIL-2022 | MAY-2022 | JUNE-2022 | JULY-2022 | AUG-2022 | SEPT-2022 | |
| | SPM ($\mu\text{g}/\text{m}^3$) | SPM ($\mu\text{g}/\text{m}^3$) | SPM ($\mu\text{g}/\text{m}^3$) | SPM ($\mu\text{g}/\text{m}^3$) | SPM ($\mu\text{g}/\text{m}^3$) | SPM ($\mu\text{g}/\text{m}^3$) | |
| RMHS | 637 | 644 | 649 | 628 | 631 | 651 | 640.0 |
| FPHS | 621 | 619 | 624 | 612 | 610 | 623 | 618.2 |
| I-Bin Building | 625 | 626 | 632 | 611 | 617 | 608 | 619.8 |
| | 1200 $\mu\text{g}/\text{m}^3$ | 1200 $\mu\text{g}/\text{m}^3$ | 1200 $\mu\text{g}/\text{m}^3$ | 1200 $\mu\text{g}/\text{m}^3$ | 1200 $\mu\text{g}/\text{m}^3$ | 1200 $\mu\text{g}/\text{m}^3$ | 1200 $\mu\text{g}/\text{m}^3$ |
| Testing Method | Gravimetric Method | Gravimetric Method | Gravimetric Method | Gravimetric Method | Gravimetric Method | Gravimetric Method | Gravimetric Method |

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Ref: VCSPL/22/R- 9420

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) STATIONARY EMISSION MONITORING REPORT

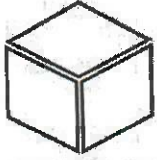
1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Monitoring Instruments : Vayubodhan Stack Sampler VSS 2

| 1. Stack Attached to GCP-1 | | | | | | | | |
|--|---------------------|----------|-----------|----------|-----------|-----------|----------|--------------------|
| Parameter | Prescribed Standard | APR-22 | MAY-22 | JUN-22 | JUL-22 | AUG-22 | SEP-22 | Six Months Average |
| Temperature °C | | 105 | 108 | 79 | 76 | 78 | 82 | 88.0 |
| Velocity m/sec | | 16.24 | 16.32 | 16.32 | 15.94 | 14.38 | 15.3 | 15.8 |
| Quantity of Gas flow | | 12586.25 | 126921.88 | 131216.8 | 128208.66 | 127608.24 | 128431.6 | 109162.2 |
| Particulate Matter (mg/Nm ³) | 50 | 27.9 | 28.6 | 26.2 | 23.8 | 27.3 | 31.6 | 27.6 |
| SO ₂ (mg/Nm ³) | | 16.7 | 16.2 | 16.8 | 16.2 | 16.4 | 18.2 | 16.8 |
| NOx (mg/Nm ³) | | 19.1 | 18.8 | 18.4 | 18.1 | 19.4 | 21.6 | 19.2 |
| 2. Stack Attached to GCP – II | | | | | | | | |
| Parameter | Prescribed Standard | APR-22 | MAY-22 | JUN-22 | JUL-22 | AUG-22 | SEP-22 | Six Months Average |
| Temperature °C | | 110.0 | 114 | 118 | 108 | 107 | 94 | 108.5 |
| Velocity m/sec | | 9.84 | 9.83 | 9.86 | 9.64 | 9.24 | 9.1 | 9.6 |
| Quantity of Gas flow | | 123845.2 | 122468.22 | 123467 | 119418.76 | 119821.6 | 118634.6 | 121275.9 |
| Particulate Matter (mg/Nm ³) | 50 | 41.8 | 40.2 | 38.2 | 36.6 | 39.2 | 42.6 | 39.8 |
| SO ₂ (mg/Nm ³) | | 28.5 | 27.8 | 27.2 | 27.8 | 26.2 | 27.6 | 27.5 |
| NOx (mg/Nm ³) | | 30.1 | 31.2 | 30.8 | 31.9 | 33.4 | 35.2 | 32.1 |

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● Waste Management Services

Ref: VCSPL/22/R-9421

Date: 28.11.2022

SIX MONTHLY COMPLIANCE REPORT (April-22 TO Sept-22) NOISE LEVEL MONITORING REPORT

1. Name of Industry : M/s. TATA Steel Ltd, (Ferro Alloys Plant), Gopalpur
2. Monitoring Instruments : Noise Meter

| CORE ZONE NOISE | | | | | | | | | | | | | | | |
|--|---------------------------|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|------------|--------------------|------------|
| Sl. No. | Noise Monitoring Location | APR-22 | | MAY-22 | | JUN-22 | | JUL-22 | | AUG-22 | | SEP-22 | | Six Months Average | |
| | | Results in dB(A)Leq | | Results in dB(A)Leq | | Results in dB(A)Leq | | Results in dB(A)Leq | | Results in dB(A)Leq | | Results in dB(A)Leq | | | |
| | | Day Time | Night Time | Day Time | Night Time | Day Time | Night Time | Day Time | Night Time | Day Time | Night Time | Day Time | Night Time | Day Time | Night Time |
| 1 | MRSS | 67.9 | 60.8 | 68.8 | 61.2 | 66.9 | 60.8 | 63.8 | 60.2 | 66.3 | 61.5 | 68.3 | 62.4 | 67.0 | 61.2 |
| 2 | LBSS | 64.2 | 55.7 | 63.6 | 54.6 | 64.8 | 58.2 | 64.1 | 56.9 | 62.8 | 56.5 | 63.5 | 58.2 | 63.8 | 56.7 |
| 3 | Canteen | 62.8 | 54.1 | 62.8 | 53.2 | 63.2 | 53.6 | 62.9 | 52.8 | 61.7 | 53.4 | 60.8 | 54.3 | 62.4 | 53.6 |
| 4 | ETP | 63.1 | 56.7 | 63.4 | 55.8 | 63.8 | 54.6 | 63.1 | 53.6 | 63.9 | 55.1 | 62.8 | 58.9 | 63.4 | 55.8 |
| Ambient Air Quality Standards in respect of Noise for Industrial Area | | | | | | | | | | | | | | 75 | 70 |
| Note: No deviation from the AAQ standard in respect of Noise is observed and all the values are with in the standard prescribed. | | | | | | | | | | | | | | | |

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| Env. Budget | | | | |
|-------------|-------------------|-------------|---------------|--------------------|
| Sl.no. | Description | Total Value | Yearly Budget | Half Yearly Budget |
| 1 | HW Audit | 70,000 | 35,000 | 17500 |
| 2 | Env. Monitoring | 21,64,120 | 1082060 | 541030 |
| 3 | ETP Calibration | 1,77,000 | 1,77,000 | 88500 |
| 4 | Plantation | 70,000 | 70,000 | 35000 |
| 5 | Greenbelt Maint. | 1,47,000 | 1,47,000 | 73500 |
| 6 | SPM ENVEA | 25,07,618 | 25,07,618 | 1253809 |
| 7 | GCP Dust Handling | 9,15,385 | 9,15,385 | 457692.5 |
| 8 | EDB at Main Gate | 7,21,871 | 7,21,871 | 360935.5 |
| | | 67,72,994 | 56,55,934 | 2827967 |

B. N. V. K.

A. Ramulu
29/11/22