



To,
**The Additional Principal Chief Conservator of Forest,
Regional Office (Eastern Central Zone)
Ministry of Environment, Forests and Climate Change, Govt. of India
Bungalow No. A-2, Shyamali Colony, Ranchi – 834002, Jharkhand.**

Ref No. - JMB/ENV/6&7/36/ 877 /2021
November 27, 2021

Ref.: Environmental Clearance letter no. - J-11015/373/2010-IA .II (M) dated- 3rd March 2014.

Sub: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEFCC, New Delhi to 6 & 7 Pits Colliery, Tata Steel Limited, Dhanbad for the period April'21 to September'21.

Dear Sir,

We are enclosing herewith compliance report for the period **April'21 to September'21** for the EC granted vide letter no.- J-11015/373/2010-IA.II (M) dated- 3rd March 2014 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

We trust the information furnished is in line with your requirement.

Thanking you,

Yours faithfully,

**Head (Planning)
Jharia Division, Tata Steel Ltd.**

Encl: As above.

Copy to: Member Secretary, CPCB, Eastern Zonal Office, Southend Conclave, 502, 5th Floor
1582, Rajdanga Main Road, Kolkata -700107.

Copy to: Member Secretary, JSPCB, T.A. Division Building (Ground Floor), H.E.C, Dhurwa,
Ranchi - 834004.

Copy to: Regional Officer, JSPCB, HIG-1 Sardar Patel Nagar, Housing Colony, Hirapur, Dhanbad

TATA STEEL LIMITED

Jharia Colliery, Jamshedpur 831113 Dhanbad India

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HALF YEARLY COMPLIANCE REPORT
(PERIOD: APRIL'21 – SEPTEMBER'21)

6&7 PITS COLLIERY
(CAPACITY: EXPANSION FROM 0.28 TO 0.6 MTPA RAW COAL)
TEHSIL: JHARIA, DIST: DHANBAD, JHARKHAND



TATA STEEL LIMITED, JHARIA DIVISION

**P.O.- JAMADOBA, DIST. - DHANBAD,
STATE- JHARKHAND, PIN CODE – 828112**

**ENVIRONMENTAL CLEARANCE GRANTED VIDE LETTER NO. - J-11015/373/2010-IA.II
(M) DATED- 03.03.2014 ISSUED BY GOVT. OF INDIA, MINISTRY OF ENVIRONMENT,
FOREST AND CLIMATE CHANGE, NEW DELHI.**

Compliance status of Environmental Clearance of Expansion of 6 and 7 Pits Colliery from 0.28 MTPA to 0.6 MTPA in an ML area 168.12 ha) of M/s Tata Steel Ltd., Village Jamadoba, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/373/2010-IA.II (M) dated March 3, 2014

S. No.	Condition	Compliance Status
Specific Condition		
(i)	Adequate measures be taken so as to prevent and control of manifestation of health problems due to coal mining activities.	The control measures implemented are as follows- i. Water spraying is carried out in underground workings ii. Water sprinkling arrangements are present at all coal transfer points in underground iii. Plantation within the mine lease area iv. Trucks carrying sand are properly covered as well as optimally loaded. v. Underground workings of the mine are well ventilated and meet the required standards prescribed by DGMS.
(ii)	Adequate green belt shall be provided around coal handling and other areas.	Green belt has been developed around the CHP of washery and mass plantation activities are taking place every year in the leasehold area.
(iii)	Transportation of coal shall be by mechanically covered trucks.	No coal transportation takes place by trucks. All coal is transported to the washery via underground conveyor belt system.
(iv)	No dumping of fly ash in low lying areas and in mine voids are permitted.	It is not applicable as there is no generation of fly-ash due to closure of our power plant since April'2015.
(v)	Utmost care be taken to prevent spillage of sand during transportation of sand.	The trucks that are being used for the transportation of sand are properly covered using tarpaulin sheets. Larger trucks have been engaged for reducing no of cycles. To ensure the compliance, every vehicle is checked as per vehicle checklist on PUC, Tyre/body condition, emission check at every entry point. Quality checks are done on trucks to ensure its health.
(vi)	No use of fly ash with sand will take place for stowing in underground mines.	It will be strictly followed.
(vii)	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.	It will be strictly followed. The EC capacity is for 0.6 MTPA raw coal while the raw coal production for 6&7 Pits Colliery is well below the limit. The production details are: <ul style="list-style-type: none"> • FY21 - 0.096 MTPA • FY20 – 0.190 MTPA • FY19 – 0.232 MTPA • FY18 – 0.239 MTPA • FY17 – 0.238 MTPA

Compliance status of Environmental Clearance of Expansion of 6 and 7 Pits Colliery from 0.28 MTPA to 0.6 MTPA in an ML area 168.12 ha) of M/s Tata Steel Ltd., Village Jamadoba, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/373/2010-IA.II (M) dated March 3, 2014

(viii)	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.	Regular monitoring of subsidence is done by Central Institute for Mining and Fuel Research, Dhanbad. According to the subsidence reports, the impact of subsidence is negligible since the underground mine workings are now at great depth and proper filling of voids through sand stowing is being done.
(ix)	If subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement of the landowners.	It will be strictly followed.
(x)	Mining shall be carried out as per statuette at a safe distance from the river/nallah flowing adjacent to the lease boundary.	The Damodar River flows at an approx. aerial distance of 2.5 kms from the lease boundary. Since this is an underground mine, no impact on the surface water bodies is expected. Though, regular monitoring on upstream and downstream of Damodar river is performed by own as well as NABL accredited laboratory.
(xi)	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Impact on land by subsidence has been found to be negligible as per the subsidence monitoring reports prepared by CIMFR, Dhanbad. Though, high root density trees of native species are covered under annual plantation program.
(xii)	Coal Extraction shall also be optimised in areas where agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring & coal extraction should be carried out below habitation, H.T. Lines & beneath road, water bodies.	It is strictly followed.
(xiii)	Subsidence shall be monitored closely and if subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement with the landowners.	Regular monitoring of subsidence is being done by CIMFR, Dhanbad and it is well within under statutory limit.
(xiv)	3-tier plantation should be developed 2 km stretch of road from the mine using native species.	Plantation along the stretches of road has been done with native species and it is a continuous process under our green belt development programme

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(xv)	Garland drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	Garland drains of adequate size and gradient already exist around the colliery area to channelize the surface runoff. Details of the same are as follows: <table border="1" data-bbox="881 432 1417 835"> <thead> <tr> <th>S. No.</th> <th>Location</th> <th>Length</th> <th>Width</th> <th>Height</th> <th>Gradient</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Office Area</td> <td>850 m</td> <td>2.5 m</td> <td>1 m</td> <td>1 in 75</td> </tr> <tr> <td>2.</td> <td>Magazine Area</td> <td>800 m</td> <td>2.5 m</td> <td>1 m</td> <td>1 in 200</td> </tr> <tr> <td>3.</td> <td>PH area</td> <td>550 m</td> <td>2.5 m</td> <td>1 m</td> <td>1 in 97</td> </tr> <tr> <td>4.</td> <td>Jitpur Area</td> <td>550 m</td> <td>3.0 m</td> <td>1 m</td> <td>1 in 60</td> </tr> <tr> <td>5.</td> <td>Brick field area</td> <td>850 m</td> <td>1.5 m</td> <td>1 m</td> <td>1 in 70</td> </tr> </tbody> </table>	S. No.	Location	Length	Width	Height	Gradient	1.	Office Area	850 m	2.5 m	1 m	1 in 75	2.	Magazine Area	800 m	2.5 m	1 m	1 in 200	3.	PH area	550 m	2.5 m	1 m	1 in 97	4.	Jitpur Area	550 m	3.0 m	1 m	1 in 60	5.	Brick field area	850 m	1.5 m	1 m	1 in 70
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(xvi)	Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.	Water spraying arrangement is present in the underground mines at all transfer points. Water spraying via tankers is done on sand transportation routes. Major approach roads have been black-topped and maintained regularly.																																				
(xvii)	Coal transportation to washery shall be through a network of underground belt conveyor system and hence there is no surface transportation of coal. Transportation of men from surface to underground and back shall be via shaft. The material transport shall be through the shaft and by means of haulage in the underground.	It is already being followed and will continue in future too.																																				
(xviii)	A progressive afforestation plan shall be prepared and implemented over the mine lease area acquired and shall include areas under green belt development, areas along roads, infrastructure, along ML boundary and township etc., by planting native species in consultation with the local DFO/Agriculture Department.	Tree plantation activities are carried out every year on the barren/ degraded areas, areas along road-side, infrastructure, etc of the colliery leasehold. Apart from these, fruit plants are distributed to employees and also to villagers, schools, institutions, etc. The environment department is responsible for implementing the afforestation plan which is prepared along with the mine management. High root density trees of native species are planted under annual plantation program every year. We have covered around 10 numbers of species under tree plantation jobs in this year.																																				
(xix)	Regular monitoring of groundwater level and quality shall be carried out by	The monitoring of groundwater level and quality is done four times a year. The																																				

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	establishing a network of existing wells and construction of new peizometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	groundwater quality report & groundwater level are provided in Annexure-I .
(xx)	Acid Water Treatment Plant, volume of water to be treated and disposal of brine should be provided.	Not applicable.
(xxi)	Mine discharge water outside the ML shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.	There is one mine-water outlet point in the colliery which is regularly monitored by the Environmental Laboratory.
(xxii)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource, in case water table shows a declining trend. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	<ul style="list-style-type: none"> • The water pumped out during underground mining activity is re-circulated back into the mine for the purpose of stowing. Backfilling of mine voids by stowing is done using sand which is having the porosity to hold the underground water thus helping aquifer to retain the underground water. • Further, there are a number of ponds existing on the surface of the mining lease which act as natural reservoirs for recharging ground water. These ponds/tanks are regularly cleaned and maintained by our CSR department. As per the hydro-geological report, the variation in the ground water level is only seasonal. • The water requirement of the nearby villages is being met by the company already. Now piped drinking water is being provided.
(xxiii)	Besides carrying out regular periodic health checkup of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health checkup for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmadabad within a	The periodic health checkup of the workers is done regularly by our Occupational Health Department, Tata Central Hospital, Jamadoba. We have a PME (Periodic Medical Examination) centre approved by DGMS where 20 % of the workers identified from workforce engaged in active mining operations are subjected to full medical check

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	period of one year and the results reported to this Ministry and to DGMS.	up including hearing impairment check up, etc. These results are regularly submitted to DGMS as per mines rules. Some sample reports and as well as past records have been submitted in previous compliance reports.
(xxiv)	The mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of mined over area. The operating mines may be analysed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed/phased out.	It is not applicable in our case.
(xxv)	Project specific CSR for an amount of Rs5/Tonne of coal production, as adjusted as per the annual inflation, should be provided for the CSR activities undertaken and the progress made thereon shall be uploaded annually on the company website. Monitoring of the impacts of activities under CSR shall be carried out periodically.	The proposed CSR expenditure for the entire company is decided as per the new Company Rules. Once the CSR budget for company is fixed, a share of that amount is dedicated and utilized for implementing the CSR activities at our Jharia Division level. The CSR expenditure for FY21 is Rs.3.29 crores. CSR data submitted is for Jharia Division which comprises all 5 collieries and 2 washeries. Jamadoba Washery, Digwadih Colliery and 6&7 Pits Colliery are adjacent to each other and fall under same leasehold area i.e. Jamadoba group of collieries. The core zone and buffer zone of all above units overlap to each other and in many cases, the villages are same where CSR work is going on. Therefore, we have a central budget for CSR which is managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 50+ villages and municipal wards. Hence, separate CSR expenditure for individual unit cannot be estimated. For calculation/ statutory reporting purpose, the consolidated CSR expenditure can be divided into unit-wise based on size of leasehold area of individual units. The progress report is uploaded every year on the company website. Internal social audits are carried out regularly to assess the impact of CSR activities.
(xxvi)	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Mine Closure Plan has been approved by Ministry of Coal, New Delhi. Details on deposition of closure cost in escrow account along with expenditure incurred for progressive closure is regularly submitted to

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		Office of Coal controller. Final mine closure along with details of corpus fund will be submitted to MoEF&CC 5 years in advance.
(xxvii)	The commitment made by the Proponent to the issue raised during Public Hearing shall be implemented by the Proponent.	<p>The commitment made by project proponent has been taken up and are being addressed gradually. Roads have been maintained in the colliery and along sand transportation routes. Subsidence studies are done every year. All the ash dumps have been reclaimed. Village ponds are cleaned as per requirement.</p> <p>Laying of drinking water pipeline network has been extended to more villages. A network of more than 22000 metres of pipeline connection has been established along with 33 water tanks (capacity of 4500 litres). Health camps are regularly organized by TSRDS. Training to SHEs, women, youth and children are provided in various fields.</p>
(xxviii)	<p>Corporate Environment Responsibility:</p> <p>a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.</p> <p>b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.</p> <p>c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.</p> <p>d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.</p>	<p>The Company already has an Environment Policy approved by the Managing Director and it addresses all the issues mentioned.</p> <p>The status of adherence to the policy and compliance to Environmental laws and regulations is regularly discussed at higher levels. Any non-compliance noticed is corrected at divisional level. If any issue is beyond our control, it is brought to the notice of higher management.</p> <p>Moreover, 6&7 Pits Colliery is IMS (Integrated Management System: Quality Management System, Environment Management System and OHSAS) certified unit addressing all environment aspects, impacts and needs and expectation of interested parties with respect to environment protection.</p>

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General Conditions:		
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	The points mentioned in the EC letter will be strictly followed. Board and Pillar method is being used for mining.
(ii)	No change in the calendar plan of production for quantum of mineral coal shall be made.	It will be strictly followed.
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	The Air quality monitoring stations are: (i) Jamadoba Group Office (Core Zone) (ii) New Village Colony, Jamadoba (Buffer Zone) (iii) Digwadih 12 No. Colony (Buffer Zone) (iv) 6&7 Pits Kalimandir area (Buffer Zone) Monitoring of heavy metals in ambient air is being performed by an independent laboratory (recognised by MoEF&CC). The results are enclosed as Annexure-I .
(iv)	Data on ambient air quality (PM10, PM 2.5, SO2 and NOx) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Ambient air quality report (PM10, PM 2.5, SO2 and NOx) for the period from Apr'21 to Sep'21 is attached as Annexure-I . Additionally, third party monitoring is done through a JSPCBC and NABL recognised Laboratory on ambient air quality (PM10, PM 2.5, SO2, NOx, CO, NH3, O3) and heavy metals (As, Ni, Cd and Cr) and results are enclosed as Annexure-I .
(v)	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	Regular noise survey is being conducted in the underground work environment. Workers are provided with ear-plugs/ muffs in high noise areas.
(vi)	Industrial wastewater (workshop and wastewater from the mine) shall 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 before discharge. Oil and grease trap shall	No industrial wastewater is generated in 6&7 Pits Colliery premises. There is a central workshop and garage in Jamadoba where Effluent Treatment Plant having oil and grease trap facility has been provided.

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	be installed before discharge of workshop effluents.	
(vii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Only the vehicles having valid PUC certificates are being allowed to operate for sand transportation. Coal transportation is done through underground belt network. Only sand transportation is done through trucks which are covered with tarpaulins as well as optimally loaded.
(viii)	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with SPCB and data got analysed through a laboratory recognised under EP Rules, 1986.	We have a fully equipped Environment Cell Laboratory with qualified personnel. The monitoring and analysis is also done at regular intervals by a JSPCB approved & NABL accredited laboratory. We have also installed a Continuous Ambient Air Quality Monitoring Station at Jamadoba for real time monitoring.
(ix)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Persons working in dusty area have been provided with dust masks & have been given awareness training on safety & health aspects. Regular PME (Periodic Medical Examinations) are being done.
(x)	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	The periodic health check-up of the workers is done regularly by our Occupational Health Department, Tata Central Hospital, Jamadoba. We have a PME (Periodic Medical Examination) centre approved by DGMS where 20 % of the workers identified from workforce engaged in active mining operations are subjected to full medical check-up including hearing impairment check-up, etc. These results are regularly submitted to DGMS as per mines rules. We are doing similar medical examination for our contractor workers in Tata central hospital.
(xi)	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.	We have a separate Environmental Management Cell with qualified personnel. The reporting of Environmental Cell is directly to General Manager of the Division.

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(xii)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Dhanbad.	The Environment Cell has a separate fund for Environmental protection measures and for complying with legal requirements. The annual environmental expenditure for the financial year 2020-21 is Rs. 635.63 Lakhs
(xiii)	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests at http://envfor.nic.in .	It has been complied with.
(xiv)	A copy of the environmental clearance letter shall be marked to concerned Panchayat/Zila Parishad, Municipal Corporation or Urban Local Body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on the company's website.	It has been complied with.
(xv)	A copy of the clearance letter shall be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.	It has been complied with.
(xvi)	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (air, water, noise and soil) and critical pollutants such as PM10, PM2.5, SO2 and NOx (ambient and stack if any) and critical sectoral parameters shall also be displayed	The clearance letter has been uploaded on the company's website. The compliance status (as Half-yearly compliance report) is being uploaded in company's website once in every six months. The display of information near the mine's office has also been done.

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	at the entrance of the project premises and mines office and in corporate office and on the company's website.	
(xvii)	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the MOEF, the respective Zonal offices of CPCB and the SPCB.	It is being complied.
(xviii)	The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.	It will be complied with.
(xix)	The environmental statement for each financial year ending 31st March in Form-V is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MOEF by E-mail.	The environmental statement for financial year 2020-21 has been submitted to JSPCB vide letter no. JMB/ENV/ESSA/05/733/2021 on 28 th September 2021 and it is also uploaded on the company website. The soft copy of Environment Statement is also sent to MOEFCC by email at ro.ranchi-mef@gov.in.

AIR QUALITY REPORT
Core zone & Buffer zone

Period- April'21 to June'21

No. of sampling points: 4

Core zone (as per Air quality standards for coal mines in EPA Notification, 1988)							
Location	Latitude/ Longitude	Date	Weather Condition	SPM 24 Hourly Limit- 700 $\mu\text{g}/\text{m}^3$	RSPM 24 Hourly Limit- 300 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 120 $\mu\text{g}/\text{m}^3$	NO _x 24 Hourly Limit-120 $\mu\text{g}/\text{m}^3$
Jamadoba Group Office	23°42'15.3"	21.04.21	Clear	206.8	78.6	12.6	14.8
	N/	04.05.21	Rainy	178.4	68.2	10.6	11.4
	86°24'11" E	18.06.21	Rainy	162.7	64.3	10.8	11.9
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10 24 Hourly Limit- 100 $\mu\text{g}/\text{m}^3$	PM2.5 24 Hourly Limit- 60 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$	NO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$
Digwadih 12 No. Colony	23°41'42"	12.04.21	Clear	84.3	39.7	12.8	10.8
	N/	10.05.21	Clear	78.6	38.2	11.6	12.5
	86°24'45.3" E	08.06.21	Clear	76.5	37.9	12.4	13.7
New Village Colony, Jamadoba	23°41'51"	26.04.21	Clear	90.5	44.7	10.2	12.7
	N/	06.05.21	Rainy	72.6	39.4	10.9	11.8
	86°23'19" E	17.06.21	Rainy	69.7	33.2	11.3	12.4
6&7 Pits Kalimandir colony	23°43'15"	22.04.21	Clear	88.7	38.0	11.6	10.3
	N/	12.05.21	Clear	80.7	41.3	11.4	12.2
	86°24'12" E	15.06.21	Rainy	70.4	34.8	11.8	12.7



Sr. Manager (Environment)

AIR QUALITY REPORT
Core zone & Buffer zone

Period- July'21 to September'21

No. of sampling points: 4

Core zone (as per Air quality standards for coal mines in EPA Notification, 1988)							
Location	Latitude/ Longitude	Date	Weather Condition	SPM 24 Hourly Limit- 700 $\mu\text{g}/\text{m}^3$	RSPM 24 Hourly Limit- 300 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 120 $\mu\text{g}/\text{m}^3$	NO _x 24 Hourly Limit-120 $\mu\text{g}/\text{m}^3$
Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	05.07.21	Cloudy	168.2	60.8	11.5	12.3
		19.08.21	Cloudy	170.4	63.2	11.2	12.0
		06.09.21	Cloudy	164.8	69.4	10.4	11.6
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10 24 Hourly Limit- 100 $\mu\text{g}/\text{m}^3$	PM2.5 24 Hourly Limit- 60 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$	NO ₂ 24 Hourly Limit-80 $\mu\text{g}/\text{m}^3$
Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	06.07.21	Clear	78.4	39.2	10.7	11.2
		16.08.21	Clear	79.4	40.2	10.8	11.6
		15.09.21	Cloudy	74.2	37.4	10.0	11.2
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	12.07.21	Cloudy	67.2	34.6	11.7	12.9
		18.08.21	Cloudy	65.8	32.1	11.0	12.2
		09.09.21	Clear	76.2	39.2	11.8	12.7
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	08.07.21	Cloudy	69.8	37.2	10.5	11.8
		23.08.21	Clear	71.4	38.7	11.2	12.8
		08.09.21	Cloudy	69.7	33.6	10.8	11.6



Sr. Manager (Environment)

**Ground Water Quality Analysis (Hand Pump & Dung Well)
(Pre- Monsoon Season- May'2021)**

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity, $\mu\text{S/m}$
1	11.05.21	Purnadih (Jorapokhar)	09:45 AM	7.95	7.4	784
2	11.05.21	Bhowra 13 No	10:20 AM	3.20	7.2	697
3	11.05.21	Mohalbani Basti	10:45 AM	6.78	7.3	810
4	11.05.21	Digwadih 12 No	11:10 AM	4.72	7.4	782
5	11.05.21	Digwadih 10 No F & J	11:35 AM	3.88	7.2	1038
6	11.05.21	Kalimela Shivmandir	01:10 PM	2.38	7.3	836
7	11.05.21	Kalimela Kalimandir	01:25 PM	4.56	7.2	798
8	11.05.21	Lower Dungari	01:55 PM	5.69	7.4	662
9	11.05.21	Upper Dungari	02:25 PM	4.18	7.5	748
10	11.05.21	Pattia Basti	02:45 PM	4.20	7.3	810
11	11.05.21	Kenduadih Basti	03:10 PM	4.65	7.4	768
12	11.05.21	Jorapokhar Kushtand	09:15 AM	4.10	7.3	798
13	11.05.21	Jamadoba 3 No	04:00 PM	5.68	7.2	766
14	11.05.21	6&7 Pits (Ayodhya Nagri)	12:10 PM	3.96	7.4	698



Sr. Manager (Environment)

**Ground Water Quality Analysis (Hand Pump & Dung Well)
(Monsoon Season- August'2021)**

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity µS/m
1	25.08.21	Purnadih (Jorapokhar)	09:35 AM	1.78	7.2	712
2	25.08.21	Bhowra 13 No	10:10 AM	0.92	7.3	658
3	25.08.21	Mohalbani Basti	10:40 AM	3.58	7.2	720
4	25.08.21	Digwadih 12 No	11:05 AM	1.26	7.1	694
5	25.08.21	Digwadih 10 No F & J	11:35 AM	1.82	7.0	984
6	25.08.21	Kalimela Shivmandir	12:30 PM	0.98	7.2	812
7	25.08.21	Kalimela Kalimandir	12:45 PM	2.71	7.1	772
8	25.08.21	Lower Dungari	01:10 PM	2.56	7.2	624
9	25.08.21	Upper Dungari	01:35 PM	1.84	7.0	728
10	25.08.21	Pattia Basti	02:25 PM	1.06	7.2	736
11	25.08.21	Kenduadih Basti	02:05 PM	0.65	7.1	710
12	25.08.21	Jorapokhar Kushtand	09:15 AM	2.25	7.2	738
13	25.08.21	Jamadoba 3 No	02:45 PM	1.62	7.3	722
14	25.08.21	6&7 Pits (Ayodhya Nagri)	12:10 PM	1.67	7.1	668



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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-1/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Date of Sampling : May 28th, 2021
 Date of Testing : 29.05.2021 to 04.06.2021
 Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
 Weather Condition -Shiny
 Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
 Location : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	78.86	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	42.12	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	26.30	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	24.12	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	21.05	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	18.15	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.795	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-1 by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-2/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Dist. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Sampling Method : IS: 5182
Date of Sampling : May 28th, 2021
Date of Testing : 29.05.2021 to 04.06.2021
Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
Weather Condition -Shiny
Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
Location : Officers Colony, 12 No. Digwadih

No.	Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1		PM ₁₀ ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-23)	76.92	2-1000($\mu\text{g}/\text{m}^3$)	100
2		PM _{2.5} ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-24)	47.38	2-100($\mu\text{g}/\text{m}^3$)	60
3		SO ₂ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-2)	23.84	5-200($\mu\text{g}/\text{m}^3$)	80
4		NO _x ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-6)	26.08	5-200($\mu\text{g}/\text{m}^3$)	80
5		NH ₃ ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-25)	20.18	0.02-700($\mu\text{g}/\text{m}^3$)	400
6		O ₃ ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-9)	17.86	1-200($\mu\text{g}/\text{m}^3$)	180
7		CO (mg/m ³)	IS:5182 (Part-10)	0.724	0-500(mg/l)	4.0
8		Pb($\mu\text{g}/\text{m}^3$)	IS:5182(Part-22)	BDL	1-100($\mu\text{g}/\text{m}^3$)	1.0
9		C ₆ H ₆ ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-11)	BDL	-	05
10		BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11		As (ng/m ³)	NAAQM Guideline Volume-1 by CPCB	BDL	1-100(ng/m ³)	06
12		Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit.

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Akhil Shekhar
Quality Manager

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Date of Sampling : May 28th, 2021
 Date of Testing : 29.05.2021 to 04.06.2021
 Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
 Weather Condition -Shiny
 Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
 Location : General Manager's Office Area

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	74.24	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	24.82	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	21.46	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	23.68	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	14.29	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	12.00	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.715	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Sampling Method : IS: 5182
Date of Sampling : May 27th, 2021
Date of Testing : 29.05.2021 to 04.06.2021
Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
Weather Condition -Shiny
Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
Location : Jamadoba Colliery

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	81.25	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	42.16	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	25.84	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	26.20	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	23.90	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	17.16	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.705	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Digwadih Club

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 11509:1990 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130 A+B	1.10	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.36	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	320.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	188.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	312.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.25	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	34.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO4- E	45.0	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	14.5	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.36	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.001-2	0.003	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.08	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as CaH ₂ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.21	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1-8	Absent	Absent

*The result are related only to item tested. BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 6&7 Pits Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 1950:1991 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130 A+B	1.10	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	500.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	204.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	220.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Cx A+B	85.60	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.23	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	42.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	46.75	1.0-150	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	15.0	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.39	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.69	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4000 B A+C	0.26	0.2-10	0.8	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9121 A+B	Absent	1.5	Absent	Absent

*The result are related only to item tested. BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Purnadih (Jorapokhar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2129 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	28.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1020.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	684.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.72	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	224.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	252.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	64.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	22.35	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.19	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	76.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	68.20	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	12.56	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.87	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.10	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.

BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Digwadih 10 No, F&J

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	29.7	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	820.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	564.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.46	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	168.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	228.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	68.80	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	13.60	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.08	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	62.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	46.78	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.50	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.64	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.14	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL - Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Kalimela Kalimandir

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	30.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	896.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	572.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4900H+ A+B	7.25	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	176.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.80	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	19.44	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.06	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	56.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	49.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	11.90	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.68	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.16	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4560CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL - Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Upper Dungari

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	32.0	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1120.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	720.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.42	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	216.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	72.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.12	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	60.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	44.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	15.25	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.61	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.21	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Kenduadih Basti

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	31.0	10-100	-	-
3.	Electrical Conductivity (umhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	854.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	532.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4560H+ A+B	7.45	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	208.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	232.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	59.20	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.12	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	46.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	35.75	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	18.75	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.65	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.15	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 6&7 Pits (Ayodhya Nagar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	30.50	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	840.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	564.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.32	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2520 A+B	204.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	70.40	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	21.38	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.21	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	58.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	39.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.56	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.57	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.22	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AN/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Instrument Used : Noise Meter (HTC)

Sl. No.	Locations	Date of Monitoring	Day Time			Night Time		
			Max.	Min.	Leq.	Max.	Min.	Leq.
1.	Central Work Shop Area Jamadoba	28.05.2021	68.2	54.2	56.2	62.6	47.8	54.2
2.	Officer's Colony, 12 No. Digwadih	28.05.2021	56.4	53.6	52.8	48.2	42.4	44.7
3.	General Manager's Office Area	28.05.2021	53.8	49.3	48.7	46.5	42.6	41.2
4.	Jamadoba Colliery	27.05.2021	68.8	56.8	66.8	64.6	49.8	52.8

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, Educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned Categories by the competent authority and the corresponding standard shall apply.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Damodar River, Up Stream

SL No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B,	7.36	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	13.50	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017 (2540C)	664.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23rd Ed. 2017 (4500 A+C)	6.5	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23rd Ed. 2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	56.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017 (4500 -C)	0.54	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017 (4500 -SO ₄ E)	32.50	1.0-250	400.0

*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C
BDL - Below Detection Limit

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TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Damodar River, Down Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23rd Ed. 2017, 4500H+A+B,	7.62	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	10.50	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017 (2540C)	676.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23rd Ed. 2017 (4500 A+C)	5.6	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23rd Ed. 2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	58.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017 (4500 - C)	0.56	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	48.50	1.0-250	400.0

*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C
BDL - Below Detection Limit

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TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 3 Pit Jamadoba Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H A+B	7.64	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	21.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	646.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	10.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	42.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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TEST REPORT OF WASTE WATER*

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Address of the Customer : Jamadoba,
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Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 2 Incline Jamadoba Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.62	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	18.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	520.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	13.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	26.0	5-90000	250.0

*The result are related only to item tested.

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Address of the Customer : Jamadoba,
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Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
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Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 6&7 Pit Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H A+B	7.50	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	12.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	590.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	9.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	36.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Digwadih Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	16.8	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	610.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	8.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	32.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

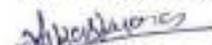
TEST REPORT OF WASTE WATER*

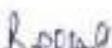
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : JCPP (Final Settling Pond)

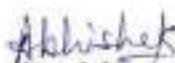
Sl No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23rd Ed. 2017, 4500H' A+B	7.35	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	17.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	926.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	6.90	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	13.50	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	40.0	5-50000

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BDL = Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : T.C.H Point -1 (Near Children's Ward)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4300H A+B	7.21	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	42.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	860.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	11.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	96.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

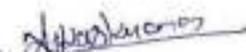
TEST REPORT OF WASTE WATER*

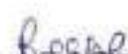
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet Jamadoba Canteen

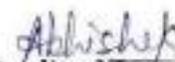
Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	8.56	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	162.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	936.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	23.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	156.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.52	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	47.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	890.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	14.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	72.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.46	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	152.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1168.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-500
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	24.50	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	178.0	5-50000

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Dist. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.18	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	39.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	780.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	20.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	76.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	6.90	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	142.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	810.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	26.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	184.0	5-50000

*The result are related only to item tested.

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TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet TCH

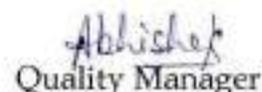
Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	7.46	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	38.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	748.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	18.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	78.0	5-50000	250.0

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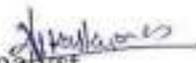
TEST REPORT OF WASTE WATER*

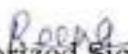
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet Garage

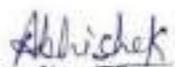
Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	7.59	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540C	176.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	980.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	27.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	188.0	5-50000

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Phone No. : (91-522) 2746282, 2745726 Telefax No.: (91 - 522) 2745726

E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAACE6076H1Z

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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

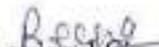
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet Garage

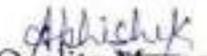
Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4900H A+B	7.35	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1136.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	22.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	86.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


 Analyst


 Authorized Signatory
 Ecomen Laboratories Pvt. Ltd.
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 Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

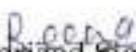
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : STP Inlet Railway Colony

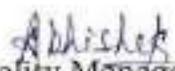
Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	8.15	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	160.0	5-3000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	856.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	47.50	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	384.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112

Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 24.05.2021 to 28.05.2021
 Date of Sample Receiving : 29.05.2021
 Date of Analysis : 29.05.2021 to 03.06.2021
 Source of Sample : STP Outlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	42.0	5-3000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	824.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	17.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	80.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

Anand Kumar
Analyst

R. Singh
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Abhishek
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ecoMen
LABORATORIES PVT LTD.

An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/Q5/FORMAT/10 TEST REPORT NO: ECO LAB/MCPM/05/21

TEST REPORT ISSUE DATE: 04.06.2021

MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Month : May, 2021

S.NO.	Locations	Date of Sampling	Mineralogical Composition (in %)			
			Silica (SiO ₂)	Ferrous oxide (FeO)	Alumina (Al ₂ O ₃)	Calcium Oxide CaO
1	Officer's Colony, 12 No. Digwadih	28.05.2021	1.64	0.08	1.36	2.98
2	Central Work Shop Area Jamadoba	28.05.2021	2.9	0.19	1.42	2.84

[Signature]
Analyst

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Authorized Signatory
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Ph.2746282 Fax-2745726

[Signature]
Quality Manager

ENVIRONMENTAL MONITORING REPORT

OF

M/S TATA STEEL LIMITED

DHANBAD

for

AUGUST - 2021

Prepared by:

ADITI R&D SERVICES

PLOT NO. I-B/17(P), SINDRI INDUSTRIAL AREA,

P.O.- DOMGARH, DIST. - DHANBAD-828107

(JHARKHAND)

M/S TATA STEEL LIMITED
(JAMADOBA GROUP)



ADITI R&D SERVICES

Testing Laboratory

NABL ACCREDITED

(A Constituent Board of Quality Council of India)

ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified

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Website: additindservices.com
Phone: 0326-2952377 (O)
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/2647

Date: 10.08.2021

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - JAMADOBA COLLIERY				
Avg. Ambient Temperature		31 ^o C	Avg. Humidity	72%
Sl No.	Particulars	Value	CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	89.96	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	40.61	60 µg/m ³	
3.	SO ₂ , µg/m ³	21.73	80 µg/m ³	
4.	NO ₂ , µg/m ³	27.29	80 µg/m ³	
5.	Ozone, µg/m ³	21.10	180 µg/m ³	
6.	NH ₃ , µg/m ³	19.82	400 µg/m ³	
7.	CO, mg/m ³	1.12	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

S. K. Das
Sr. Chemist
Aditi R&D Services



[Signature]
Technical Manager
Aditi R&D Services, Sindri

Statements :

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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/2648

Date: 10.08.2021

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

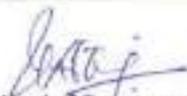
TEST RESULTS

LOCATION - GENERAL MANAGER'S OFFICE AREA			
	Avg. Ambient Temperature	31°C	Avg. Humidity
Sl No.	Particulars	Value	72% NAAQ - CPCB STANDARD
1.	Particulate Matter (PM ₁₀), µg/m ³	86.98	100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	53.10	60 µg/m ³
3.	SO ₂ , µg/m ³	16.65	80 µg/m ³
4.	NO ₂ , µg/m ³	29.76	80 µg/m ³
5.	Ozone, µg/m ³	18.6	180 µg/m ³
6.	NH ₃ , µg/m ³	15.2	400 µg/m ³
7.	CO, mg/m ³	1.72	4 mg/m ³
8.	Pb, µg/m ³	BDL	1 µg/m ³
9.	As, ng/m ³	BDL	6 ng/m ³
10.	Ni, ng/m ³	BDL	20 ng/m ³
11.	Benzene, µg/m ³	BDL	5 µg/m ³
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Phone: 0326-2952377 (O)
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/2649

Date: 10.08.2021

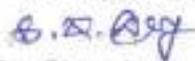
TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - OFFICERS COLONY, 12 NO. DIGWADIH				
	Avg. Ambient Temperature	31°C	Avg. Humidity	71%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	76.83	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	41.00	60 µg/m ³	
3.	SO ₂ , µg/m ³	15.16	80 µg/m ³	
4.	NO ₂ , µg/m ³	27.22	80 µg/m ³	
5.	Ozone, µg/m ³	19.94	180 µg/m ³	
6.	NH ₃ , µg/m ³	16.53	400 µg/m ³	
7.	CO, mg/m ³	0.74	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Jharkhand - 828107
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Website: aditirdservices.com
Phone: 0326-2952377 (O)
Mobile: 09471358492, 09431512508

Ref. No.: - ARDS/21-22/2650

Date: 10.08.2021

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

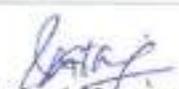
TEST RESULTS

LOCATION – CENTRAL WORKSHOP AREA, JAMADOBA				
	Avg. Ambient Temperature	31°C	Avg. Humidity	71%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	88.2	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	42.52	60 µg/m ³	
3.	SO ₂ , µg/m ³	18.68	80 µg/m ³	
4.	NO ₂ , µg/m ³	24.27	80 µg/m ³	
5.	Ozone, µg/m ³	18.1	180 µg/m ³	
6.	NH ₃ , µg/m ³	19.53	400 µg/m ³	
7.	CO, mg/m ³	1.01	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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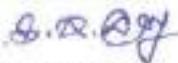
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Phone: 0326-2952377 (O)
Mobile: 09471358492, 09431512608

TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

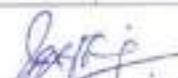
Ref. No. & Date		NAME AND ADDRESS OF THE CLIENT		
ARDS/21-22/2651 Date:10.08.2021		M/S TATA STEEL, JAMADOBA,		
Date of Monitoring		TATA STEEL LIMITED, JAMADOBA GROUP PLANT,		
06.08.2021 - 07.08.2021		Avg. Ambient Temperature(°C)	Average Humidity (%)	Weather Condition
Work Order 4700092573/932 Dt. 20.07.2021		29	68	Clear
				Status of the plant
				Running

MONITORING RESULTS

Sl. No	Place of Monitoring	Day Time (6 AM to 10 PM) Avg. dB(A)			Night Time (10 PM to 6 AM) Avg. dB(A)			Noise level (Ambient standard) for Industrial Area as per CPCB Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 notified vide S.O. 1046(E) Dt. 22.11.2020 Limit in dB(A) Leq	
		MAX	MIN	AVG. dB(A) Leq	MAX	MIN	AVERAGE dB(A) Leq	Day Time	Night Time
	JAMADOBA GROUP							Industrial Area	Industrial Area
1.	Central Workshop	69.8	56.7	67.0	55.8	50.1	53.82	75	70
2.	Jamadoba Colliery	72.8	63.8	70.30	61.7	54.2	59.40		
3.	GM Office Area	52.5	50.2	51.49	50.9	46.7	49.29		
								Residential Area	Residential Area
4.	Officer Colony 12 No. Digwadith	50.5	46.5	49.03	44.6	42.2	43.56	55	45


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Website: aditirmservices.com
Phone: 0326-2952377 (O)
Mobile: 09471358492, 09431512808

Ref. No.: - ARDS/21-22/2791

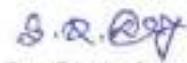
Date: 18.08.2021

TEST REPORT OF MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

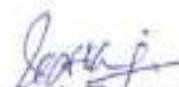
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 07.08.2021
- Date of Testing : 09.08.2021 – 12.08.2021

TEST RESULTS

Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	General Manager's Office Area	1.74	0.05	1.19	2.3
2.	Jamadoba Colliery	2.05	0.12	1.24	2.95


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No. - ARDS/21-22/ 2792

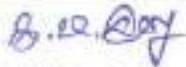
Date: 18.08.2021

TEST REPORT OF SURFACE WATER

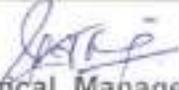
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. Damodar River Up Stream
2. Damodar River Dn Stream
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 - 13.08.2021
- Test : pH, TDS, Turbidity, DO, BOD, Cl, F, SO₄

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		Limit as per IS 2296 Class - C	Test Method
		Damodar River Up Stream	Damodar River Dn Stream		
1.	pH,	7.4	7.7	6.5 -8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	618	672	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	11.8	15.5	-	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	6.5	5.4	4.0	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.0	1.5	3.0	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	48.0	70.0	-	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.55	0.61	1.5	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	42.12	60.24	400	IS-3025 (P-24):1986


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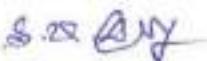
Date: 18.08.2021

TEST REPORT OF MINE WATER DISCHARGE

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. 2 Pit Jamadoba Colliery
2. 3 Pit Jamadoba Colliery
3. 2 Incline Jamadoba Colliery
4. 6 & 7 Pits Colliery
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 16.08.2021
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE				Limit as per IS-2296 Class B (For Bathing)	Test Method
		2 Pit Jamadoba Colliery	3 Pit Jamadoba Colliery	2 Incline Jamadoba Colliery	6 & 7 Pits Colliery		
1.	pH,	7.88	7.70	7.58	8.08	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	672	674	610	692	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	13.0	11.8	10.8	10.28	-	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	2.0	1.8	1.6	1.7	3	IS-3025 (P-44): 1994
5.	Chemical Oxygen Demand, mg/l	32	30.0	25.2	28.8	-	IS-3025 (P-58): 2006
6.	Oil & Grease, mg/l	BDL	BDL	BDL	BDL	-	IS-3025 (P-39): 2021


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Ref. No.: - ARDS/21-22/2793

Date: 18.08.2021

TEST REPORT OF EFFLUENT

- Name of the Industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. JCPP (Final Settling Pond)
2. T.C.H. Point- 2 (Near Casualty)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 16.08.2021
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		MoEF&C Notification 1 st Jan.2016 Permissible Max. Desirable Limit	Test Method
		JCPP (Final Settling Pond)	TCH Point 2 (Near Casualty)		
1.	pH,	8.20	7.22	6.0-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	972	852	2100	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	14.10	50.1	100	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	1.9	2.0	30	IS-3025 (P-44): 1994
5.	Chemical Oxygen Demand, mg/l	31.0	96.0	250	IS-3025 (P-58): 2006
6.	• Oil & Grease, mg/l	BDL	BDL	10	IS-3025 (P-39): 2021


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Ref. No. : - ARDS/21-22/ 2794

Date: 18.08.2021

TEST REPORT OF DRINKING WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. W. T. P. (Jamadoba)
2. W. T. P. (Digwadih)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 - 13.08.2021
- Test :

Res. Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride,

Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Hexavalent Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		IS as per IS 10500:2012		Test Method
		W.T.P. Jamadoba	W.T.P. Digwadih	Desirable	Permissible	
1.	Colour, (Hazen Unit)	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-7):2017
4.	Turbidity, NTU	1	1	1.0	5.0	IS 3025 (P-10):1984
5.	pH	7.4	7.1	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	284.42	295.68	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	44.0	46.6	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ , mg/l	NIL	NIL	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	660	670	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	84	92	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	BDL	BDL	0.05	1.5	IS 3025 (P-42):1992

Continued on Page 2



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- 2 -

Sl. No.	PARAMETERS OF TEST	VALUE		IS as per IS 10500:1991		Test Method
		W. T. P. Jamadoba	W.T.P. Digwadih	Desirable	Permissible	
12.	Manganese as Mn, mg/l	BDL	BDL	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO ₄ , mg/l	42	56	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	4.0	3.2	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.3	0.2	1.0	1.5	IS 3025 (P-60):2008
16.	Phenolic Compound as (C ₆ H ₅ OH) mg/l	BDL	BDL	0.001	0.002	IS 3025 (P-43):1992
17.	Mercury as Hg, mg/l	BDL	BDL	0.001	No. Relax	IS 3025 (P-48):1994
18.	Cadmium as Cd, mg/l	BDL	BDL	0.003	No. Relax	IS 3025 (P-41):1992
19.	Arsenic as As, mg/l	BDL	BDL	0.01	No. Relax	IS 3025 (P-37):1988
20.	Cyanide as CN, mg/l	BDL	BDL	0.05	No. Relax	IS 3025 (P-27):1986
21.	Lead as Pb, mg/l	BDL	BDL	0.01	No. Relax	IS 3025 (P-47):1994
22.	Zinc as Zn, mg/l	0.1	0.15	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	Hexavalent Chromium as Cr, mg/l	BDL	BDL	0.05	No. Relax	IS 3025 (P-52):2003
25.	Mineral Oil, mg/l	BDL	BDL	0.5	No. Relax	IS 3025 (P-39):1989
26.	Alkalinity as CaCO ₃ , mg/l	391	412	200	600	IS 3025 (P-23):1983
27.	Aluminium as Al, mg/l	BDL	BDL	0.03	0.2	IS 3025 (P-55):2003
28.	Boron as B, mg/l	BDL	BDL	0.5	1.0	IS 3025 (P-57):2005

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/ 2795

Date: 18.08.2021

TEST REPORT OF GROUND WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Sample Code :
 - Bhowra 13 No
 - Mohalbani Basti
 - Lower Dungari
 - Jorapokhar Kushtand
 - Jamadoba 3 No
- Date of Sample Collection : 06.08.2021
- Date of Testing : 09.08.2021 – 13.08.2021
- Test : Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride, Res. Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Hexavalent Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Bhowra 13 No	Mohalbani Basti	Lower Dungari	Jorapokhar Kushtand	Jamadoba 3 No	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	1	1	2	1	5	15	IS 3025 (P-4): 2021
2.	Temperature °C	28.2	27.8	28.3	27	26	-	-	-
3.	Electrical Conductivity, μ mhos/cm	950	1250	1070	1012	970	-	-	-
4.	Total Dissolved Solids, mg/l	636	837	749	594	650	-	-	IS 3025(P-16):1984
5.	pH	7.6	7.8	7.5	7.7	7.5	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	340	171.78	128.56	252	245	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	95	48	30.7	60	64	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	26	12.8	12.8	25	24.5	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	36.5	30.1	52.1	40.1	55	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.30	0.32	0.4	0.35	0.38	1.0	1.5	IS 3025(P-60):2008

Continued on Page -2



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Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Bhowra 13 No	Mohalbari Basti	Lower Dungari	Jorapokhar Kushtand	Jamadoba 3 No	Desirable	Permissible	
11	Sulphate as SO ₄ , mg/l	40.4	38.5	38.2	44.1	38.5	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	12.6	16.3	7.25	12.6	10.5	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l	241	204	252	125	432	200	600	IS 3025(P-23):1983
14	Lead as Pb, mg/l	BDL	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025(P-47):1994
15	Zinc as Zn, mg/l	0.18	0.16	0.12	0.11	0.1	5	15	IS 3025(P-42):1992
16	Iron as Fe, mg/l	0.16	0.18	0.15	0.17	0.14	0.3	No. Relax	IS 3025(P-53):2003
17	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	1.5	IS 3026 (P-42):1992
18	Mercury as Hg, mg/l	BDL	BDL	BDL	BDL	BDL	0.001	No. Relax	IS 3025(P-48):1994
19	Cadmium as Cd, mg/l	BDL	BDL	BDL	BDL	BDL	0.003	No. Relax	IS 3025(P-41):1992
20	Nickel as Ni, mg/l	BDL	BDL	BDL	BDL	BDL	0.02	No. Relax	IS 3025(P-37):1992
21	Arsenic as As, mg/l	BDL	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025(P-37):1988
22	Cyanide as CN, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025(P-27):1986
22	Total Chromium as Cr, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025(P-52):2003

NOTE: BDL - Below Detection Limit


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Aditi R&D Services




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Ref. No.: - ARDS/21-22/2796

Date: 18.08.2021

TEST REPORT OF ETP

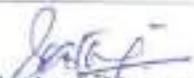
- Name of the industry : M/S TATA STEEL, JAMADOBA,
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JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : ETP - TCH (Inlet and Outlet)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 - 16.08.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		G.S.R 422 (E) Max. Desirable Limit	Test Method
		ETP INLET-TCH	ETP OUTLET-TCH		
1.	pH,	7.2	7.5	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	1052	824	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids	140	40.8	100	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	25.4	19.0	30.0	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	172	65	250	IS-3025 (P-58):2006
6.	Oil & Grease	2.5	BDL	10	IS-3025 (P-39):2021


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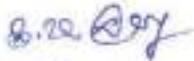
Date: 18.08.2021

TEST REPORT OF ETP

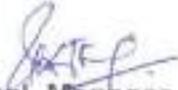
- Name of the industry : M/S TATA STEEL, JAMADOBA,
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DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : ETP - GARAGE (Inlet and Outlet)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 - 13.08.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		G.S.R 422(E) Desirable Limit	Test Method
		ETP INLET-GARAGE	ETP OUTLET-GARAGE		
1.	pH,	7.50	7.66	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	875	751	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids	82	10	100	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	24	9.5	30.0	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	196	81.4	250	IS-3025 (P-58):2006
6.	Oil & Grease	2.5	BDL	10	IS-3025 (P-39):2021


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

Statements :

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- The test results reported in this report are valid at the time of and under the stated condition of measurement.
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ADITI R&D SERVICES

Testing Laboratory

NABL ACCREDITED

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ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified

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Ref. No.: - ARDS/21-22/ 2798

Date: 18.08.2021

TEST REPORT OF STP

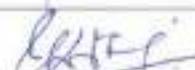
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : STP - RAILWAY COLONY (Inlet and Outlet)
- Date of Sample Collection: 07.08.2021
- Date of Testing : 09.08.2021 - 13.08.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		LIMIT G.S.R 422(E) (Inland Surface Water Discharge)		Test Method
		STP INLET- RAILWAY COLONY	STP OUTLET- RAILWAY COLONY	Inlet	Outlet	
1.	pH,	8.20	7.34	-	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	774	864	-	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids	148	42	-	100	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	44.0	18.2	-	30.0	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	354	86.0	-	250	IS-3025 (P-58):2006
6.	Oil & Grease	BDL	BDL	-	10	IS-3025 (P-39):2021


Sr. Chemist
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Technical Manager
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