



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/KOCP/24/ 875/2021  
November 27, 2021

Ref.: Environmental Clearance letter no. - J-11015/252/2005-IA.II (M) dated June 22, 2006

**Sub: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEF&CC, New Delhi to Kalimela Open Cast Project, 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-11015/252/2005-IA.II(M), Dated-22<sup>nd</sup> June 2006 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, 5<sup>th</sup> 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

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

**OCP KALIMELA PROJECT  
UNDER JAMADOBA COLLIERY**



**TATA STEEL LIMITED, JHARIA DIVISION**

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

**ENVIRONMENTAL CLEARANCE GRANTED VIDE LETTER NO. - J-11015/252/2005-  
IA.II(M) DATED- 22<sup>ND</sup> JUNE 2006 ISSUED BY GOVT. OF INDIA, MINISTRY OF  
ENVIRONMENT & FOREST, NEW DELHI.**

**Compliance status of Environmental Clearance of Kalimela Open Cast Mining Project (0.34 MTPA) of M/s Tata Steel Ltd., Village Dungri, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/252/2005-IA.II (M) dated June 22, 2006**

S. No.	Condition	Compliance Status
<b>Specific Condition:</b>		
(i)	All the conditions stipulated by SPCB in their NOC no N-35 dated 31.01.2005 are to be implemented effectively.	NOC conditions are being complied with. The open cast operations have ceased, and no raw coal production is taking place.  Currently the backfilling of the mine void by the OB has been completed and biological reclamation work is in progress.
(ii)	The bund/embankment shall be designed taking into account highest flood level, based on past data, in the Damodar River/ Dungri Jore so as to guard against mine inundation.	The embankment exists along Dungri Jore. The HFL (Highest flood line) of Damodar river is way below the surface level of open cast mine hence bunds across the river is not necessary.
(iii)	Topsoil should be stacked properly with proper slope at earmarked sites and should not be kept active and shall be used for reclamation and development of green belt.	No further top soil will be generated as coal mining activity has been ceased. The back filling has been completed and the top soil is being used for biological reclamation of backfilled and OB area.
(iv)	OB should be stacked at earmarked external OB dumpsite(s) within ML area and shall be a maximum height of 60m only and consist of benches of 10m each. The ultimate slope of the dump shall not exceed 28°. Backfilling shall begin at the end of 3rd year in the decoaled area. Monitoring and management of existing reclaimed dumpsites should continue until the vegetation becomes self-sustaining. Compliance Status should be submitted to the MOEF and its regional office at Bhubaneswar on yearly basis.	OB was stacked within ML area at an area of 12 ha approx. About 24.08 lakh cum of OB generated has been stacked with an approximate height reached of 50 mts. The other conditions are being followed as well.  This OB has been used for backfilling the mine pit as part of our mine closure plan. Now the backfilling work has been completed and biological reclamation work is in progress.
(v)	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development, etc. The drains should be regularly desilted and maintained properly. Garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of slit material.	Catch drain and siltation ponds have been constructed to arrest the debris, silt and sediment flows from OB dumps. Collected water had been used for watering mine area, roads & plantation. Total length of catch drains was 2200 mts. Garland drains (about 1790 mts) had been completely constructed around the mine site to ensure runoff water during rainy season is properly drained off. Since mine area has not going to expand, no additional garland drains are required as of now.

**Compliance status of Environmental Clearance of Kalimela Open Cast Mining Project (0.34 MTPA) of M/s Tata Steel Ltd., Village Dungri, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/252/2005-IA.II (M) dated June 22, 2006**

(vi)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data	Retention wall (or Toe wall) of about 2200 mts. exists around the dump area to check run-off and siltation.
(vii)	The effluents from the coal washery shall be treated to prescribed norms before discharge from the lease.	There is no separate coal washery for OCP Kalimela. We have a central coal washery for Jamadoba group of mines, about 1.5 kms away, which has a closed water circuit system to maintain zero discharge.
(viii)	Crushers at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	There is no separate CHP for OCP Kalimela. The existing CHP for Jamadoba group of mines already has adequate measures in place such as water sprinkling system (fixed and movable) and dry fog system.
(ix)	Drills should be wet operated.	It is not applicable now as mining has ceased.
(x)	Controlled blasting should be practiced only during daytime with use of delay detonators. The mitigative measures for control of ground vibration and to arrest the fly rocks and boulders should be implemented.	It is not applicable now as mining has ceased.
(xi)	Area brought under afforestation includes reclaimed external OB dump (12.89 ha), backfilled area (25.15 ha), along ML boundary, along roads (0.45 ha) and in undisturbed area (1.14 ha) within the lease area by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	The backfilling work has been completed and the biological reclamation work is in progress .
(xii)	A progressive closure plan shall be implemented by reclamation of quarry area of 25.15 ha which shall be backfilled and afforested by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha. The balance 1.10 ha of decoaled area shall be converted into a water reservoir, the upper benches of which shall be gently sloped and stabilized and reclaimed with plantation.	The reclamation work is in progress as per the progressive mine closure Plan.  The mine closure plan of KOCP is under mining plan of Jamadoba Colliery (including MCP of Kalimela) has been approved by MOC, Delhi.
(xiii)	Conservation Plan for endangered species, if any, found in and around the project area shall be formulated, if required, in consultation with the State Forest and Wildlife Departments.	Not Applicable.

**Compliance status of Environmental Clearance of Kalimela Open Cast Mining Project (0.34 MTPA) of M/s Tata Steel Ltd., Village Dungri, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/252/2005-IA.II (M) dated June 22, 2006**

(xiv)	The company shall obtain prior approval of CGWA/ CGWB Regional Office for use of groundwater if any, for mining operations.	Not Applicable.
(xv)	Regular monitoring of groundwater level and quality should be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity should 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 should be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board quarterly within one month of monitoring.	Now there will be no impact on ground water as mining has ceased. However, quality of groundwater is regularly analysed as required and attached in <b>Annexure-I</b>
(xvi)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	Now there will be no impact on ground water as mining has ceased. However, quality of groundwater is regularly analysed as required and attached in <b>Annexure-I</b>
(xvii)	ETP should also be provided for workshop, coal washery and CHP wastewater.	It is not applicable. Though ETP for Central Workshop has been commissioned having facility of Oil & Grease Trap.
(xviii)	R&R shall not be less than the norms laid down by the State Government and shall be completed within a specified time-frame.	It is not applicable.
(xix)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests for approval 5 years in advance of final mine closure for approval.	It has been approved by MOC, Delhi and submitted to MoEF&CC.
(xx)	Consent to operate shall be obtained before starting mining operations.	Consent to operate has been obtained from JSPCB vide letter ref. No. JSPCB/HO/RNC/CTO-2512557/2018/1469 dated-18.09.2018 valid up to 30.09.2022.
<b>General Conditions:</b>		
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and forest.	All mining excavation activities are terminated. Reclamation work is in progress
(i)	No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.	All mining excavation activities are terminated. Reclamation work is in progress.
(ii)	Four Ambient Air quality monitoring station should be established in the core zones as well as in the buffer zone SPM, RSPM, SO2	The operations have now ceased. The ambient air monitoring is done at 4 locations and the reports are attached as <b>Annexure-I</b>

**Compliance status of Environmental Clearance of Kalimela Open Cast Mining Project (0.34 MTPA) of M/s Tata Steel Ltd., Village Dungri, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/252/2005-IA.II (M) dated June 22, 2006**

	and NOX monitoring location of the stations should be decided based on the metrological data & topographical features & environmentally & ecologically sensitive targets in consultation with SPCB.	
(iii)	Fugitive dust emissions (SPM & RSPM) from all the sources should be controlled regularly monitored & data recorded properly. Water spraying arrangement on haul roads, wagon loading, and dump trucks (loading & unloading) points should be provided & properly maintained.	Presently no coal excavation and coal transportation jobs are going on. However, water sprinkling on roads is being done regularly.
(iv)	Data on ambient air quality (SPM, RSPM, SOx & NOx) should be regularly submitted to the Ministry including its regional office at Bhubaneswar and to the SPCB & CPCB once in six months.	The ambient air monitoring is done at 4 locations and the reports are submitted to SPCB, CPCB & MoEFCC on half yearly basis( <b>Annexure-I</b> )
(v)	Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations of HEMM etc. All should be provided with Ear Plug/Muff.	It is not applicable now.
(vi)	Industrial waste water (Workshop and Waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharged. Oil and Grease trap should be installed before discharge of Work shop effluent.	There is no generation of waste water.
(vii)	Vehicular emissions should be kept under control and regularly monitored. Vehicle used for transporting the mineral should be covered with tarpaulins and optimally loaded.	No mineral is being transported now. The vehicles carrying OB are only allowed to ply after securing full compliance on vehicle check list. Check list ensures the optimum load, good condition, emissions under limit.
(viii)	Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the SPCB.	We have a fully equipped Environment Cell Laboratory with qualified personnel. The monitoring and analysis is also done at regular intervals by a NABL and JSPCB recognised laboratory
(ix)	Personnel working in dusty area should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspect. Occupational Health Surveillance programme of the worker should be under	It is not applicable now.

**Compliance status of Environmental Clearance of Kalimela Open Cast Mining Project (0.34 MTPA) of M/s Tata Steel Ltd., Village Dungri, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/252/2005-IA.II (M) dated June 22, 2006**

	taken periodically to observe any contraction due to exposure to dust and to take corrective measures if needed.	
(x)	A separate Environmental Management cell with suitable qualified personnel should be set up under the control of a senior executive, who will report directly to the Head of the Company.	We have a separate Environmental Management Cell with four qualified personnel. The reporting of Environmental Cell is directly to General Manager of the Division.
(xi)	Funds earmarked for environmental protection measures should be kept in separate A/C and should not be diverted for other purposes. Year wise expenditure should be reported to this ministry and its regional office at Bhubaneswar.	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. 292.71 lakhs.
(xii)	The regional office of this ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities shall extend full co-operation to the officer of regional office by furnishing the requisite Data/ information/ monitoring report.	Being complied. All data is being furnished in the compliance report and during inspection.

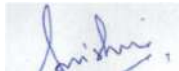
**AIR QUALITY REPORT**

Core zone &amp; 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 <sub>2</sub> 24 Hourly Limit- 120 $\mu\text{g}/\text{m}^3$	NO <sub>x</sub> 24 Hourly Limit-120 $\mu\text{g}/\text{m}^3$
Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	21.04.21	Clear	206.8	78.6	12.6	14.8
		04.05.21	Rainy	178.4	68.2	10.6	11.4
		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 <sub>2</sub> 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$	NO <sub>2</sub> 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$
Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	12.04.21	Clear	84.3	39.7	12.8	10.8
		10.05.21	Clear	78.6	38.2	11.6	12.5
		08.06.21	Clear	76.5	37.9	12.4	13.7
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	26.04.21	Clear	90.5	44.7	10.2	12.7
		06.05.21	Rainy	72.6	39.4	10.9	11.8
		17.06.21	Rainy	69.7	33.2	11.3	12.4
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	22.04.21	Clear	88.7	38.0	11.6	10.3
		12.05.21	Clear	80.7	41.3	11.4	12.2
		15.06.21	Rainy	70.4	34.8	11.8	12.7


**Sr. Manager (Environment)**



**AIR QUALITY REPORT**

Core zone &amp; 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 µg/m <sup>3</sup>	RSPM 24 Hourly Limit- 300 µg/m <sup>3</sup>	SO <sub>2</sub> 24 Hourly Limit- 120 µg/m <sup>3</sup>	NO <sub>x</sub> 24 Hourly Limit-120 µg/m <sup>3</sup>
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- 100µg/m <sup>3</sup>	PM2.5 24 Hourly Limit- 60µg/m <sup>3</sup>	SO <sub>2</sub> 24 Hourly Limit- 80µg/m <sup>3</sup>	NO <sub>2</sub> 24 Hourly Limit-80µg/m <sup>3</sup>
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, $\mu\text{S}/\text{m}$
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 $\mu\text{S/m}$
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



**Sr. Manager (Environment)**

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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/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 28<sup>th</sup>, 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 <sup>th</sup> , 2009
1	PM <sub>10</sub> (µg/m <sup>3</sup> )	IS:5182(Part-23)	78.86	2-1000(µg/m <sup>3</sup> )	100
2	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	IS:5182(Part-24)	42.12	2-100(µg/m <sup>3</sup> )	60
3	SO <sub>2</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-2)	26.30	5-200(µg/m <sup>3</sup> )	80
4	NO <sub>x</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-6)	24.12	5-200(µg/m <sup>3</sup> )	80
5	NH <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-25)	21.05	0.02-700(µg/m <sup>3</sup> )	400
6	O <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-9)	18.15	1-200(µg/m <sup>3</sup> )	180
7	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	0.795	0-500(mg/l)	4.0
8	Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100(µg/m <sup>3</sup> )	1.0
9	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m <sup>3</sup> )	IS:5182(Part-12)	BDL	>2(ng/m <sup>3</sup> )	01
11	As (ng/m <sup>3</sup> )	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m <sup>3</sup> )	06
12	Ni (ng/m <sup>3</sup> )	IS:5182(Part-26)	BDL	1-100(ng/m <sup>3</sup> )	20

\*The results is related only to tested item.

**Note:** Below Detection Limit

*Shankar*  
Analyst

*Roena*  
Authorized Signatory  
Ecomen Laboratories Pvt. Ltd  
Flat No.8 Second Floor Arif Chamber  
Sector-H, Aliganj, Lucknow-226024  
Ph.2746282 Fax-2745726

*Abhishek*  
Quality Manager

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LABORATORIES PVT LTD.

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-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, Distt. Dhanbad  
Jharkhand  
Sample Collected By : Mr. Arvind Singh  
Sampling Method : IS: 5182  
Date of Sampling : May 28<sup>th</sup>, 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 <sup>th</sup> , 2009
1		PM <sub>10</sub> (µg/m <sup>3</sup> )	IS:5182(Part-23)	76.92	2-1000(µg/m <sup>3</sup> )	100
2		PM <sub>2.5</sub> (µg/m <sup>3</sup> )	IS:5182(Part-24)	47.38	2-100(µg/m <sup>3</sup> )	60
3		SO <sub>2</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-2)	23.84	5-200(µg/m <sup>3</sup> )	80
4		NO <sub>x</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-6)	26.08	5-200(µg/m <sup>3</sup> )	80
5		NH <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-25)	20.18	0.02-700(µg/m <sup>3</sup> )	400
6		O <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-9)	17.86	1-200(µg/m <sup>3</sup> )	180
7		CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	0.724	0-500(mg/l)	4.0
8		Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100(µg/m <sup>3</sup> )	1.0
9		C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	IS:5182(Part-11)	BDL	-	05
10		BaP (ng/m <sup>3</sup> )	IS:5182(Part-12)	BDL	>2(ng/m <sup>3</sup> )	01
11		As (ng/m <sup>3</sup> )	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m <sup>3</sup> )	06
12		Ni (ng/m <sup>3</sup> )	IS:5182(Part-26)	BDL	1-100(ng/m <sup>3</sup> )	20

\*The results is related only to tested item.

**Note:** Below Detection Limit.

*Arif*  
Analyst

*Ravi*  
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*Abhishek*  
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LABORATORIES PVT LTD.

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-3/05/21

TEST REPORT ISSUE DATE: 04/06/2021

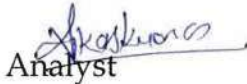
## TEST REPORT OF AMBIENT AIR\*


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 28<sup>th</sup>, 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 <sup>th</sup> , 2009
1	PM <sub>10</sub> (µg/m <sup>3</sup> )	IS:5182(Part-23)	74.24	2-1000(µg/m <sup>3</sup> )	100
2	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	IS:5182(Part-24)	24.82	2-100(µg/m <sup>3</sup> )	60
3	SO <sub>2</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-2)	21.46	5-200(µg/m <sup>3</sup> )	80
4	NO <sub>x</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-6)	23.68	5-200(µg/m <sup>3</sup> )	80
5	NH <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-25)	14.29	0.02-700(µg/m <sup>3</sup> )	400
6	O <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-9)	12.00	1-200(µg/m <sup>3</sup> )	180
7	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	0.715	0-500(mg/l)	4.0
8	Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100(µg/m <sup>3</sup> )	1.0
9	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m <sup>3</sup> )	IS:5182(Part-12)	BDL	>2(ng/m <sup>3</sup> )	01
11	As (ng/m <sup>3</sup> )	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m <sup>3</sup> )	06
12	Ni (ng/m <sup>3</sup> )	IS:5182(Part-26)	BDL	1-100(ng/m <sup>3</sup> )	20

\*The results is related only to tested item.

**Note:** Below Detection Limit

  
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LABORATORIES PVT LTD.

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-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 27<sup>th</sup>, 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 <sup>th</sup> , 2009
1	PM <sub>10</sub> (µg/m <sup>3</sup> )	IS:5182(Part-23)	81.25	2-1000(µg/m <sup>3</sup> )	100
2	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	IS:5182(Part-24)	42.16	2-100(µg/m <sup>3</sup> )	60
3	SO <sub>2</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-2)	25.84	5-200(µg/m <sup>3</sup> )	80
4	NO <sub>x</sub> (µg/m <sup>3</sup> )	IS:5182 (Part-6)	26.20	5-200(µg/m <sup>3</sup> )	80
5	NH <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-25)	23.90	0.02-700(µg/m <sup>3</sup> )	400
6	O <sub>3</sub> (µg/m <sup>3</sup> )	IS:5182(Part-9)	17.16	1-200(µg/m <sup>3</sup> )	180
7	CO (mg/m <sup>3</sup> )	IS:5182 (Part-10)	0.705	0-500(mg/l)	4.0
8	Pb(µg/m <sup>3</sup> )	IS:5182(Part-22)	BDL	1-100(µg/m <sup>3</sup> )	1.0
9	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m <sup>3</sup> )	IS:5182(Part-12)	BDL	>2(ng/m <sup>3</sup> )	01
11	As (ng/m <sup>3</sup> )	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m <sup>3</sup> )	06
12	Ni (ng/m <sup>3</sup> )	IS:5182(Part-26)	BDL	1-100(ng/m <sup>3</sup> )	20

\*The results is related only to tested item.

Note: Below Detection Limit.

*Arvind Singh*  
Analyst

*Roopa*  
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LABORATORIES PVT LTD.

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 DRINKING WATER\*

Name of the Customer : M/s Tata Steel Ltd. (JamadobaGroup)  
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 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.	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	1.16	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	520.0	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 <sub>3</sub> (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	45.0	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO <sub>3</sub> (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	0.002-2	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	0.08	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 C <sub>6</sub> H <sub>5</sub> 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

*Ravi Bhargava*  
Analyst

*Ravi Bhargava*  
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LABORATORIES PVT LTD.

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 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 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.	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	590.0	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 <sub>3</sub> (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 Ca A+B	65.60	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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	46.75	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO <sub>3</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- 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	0.09	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 <sub>6</sub> H <sub>5</sub> 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	0.26	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

*Ravi Bhargava*  
Analyst

*Ravi Bhargava*  
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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, 2120 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 ( $\mu$ mhos/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 <sub>3</sub> (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, 23 <sup>rd</sup> 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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	68.20	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>3</sub> (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, 23 <sup>rd</sup> 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, 23 <sup>rd</sup> 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

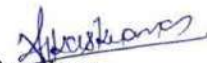
TEST REPORT ISSUE DATE: 04.06.2021

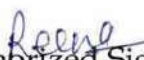
## TEST REPORT OF GROUND WATER\*

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 : Digwadiah 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 (0C)	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 <sub>3</sub> (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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	46.78	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>3</sub> (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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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 : Kalimela Kalimandir

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)	30.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA,23 <sup>rd</sup> Ed.2017, 2510-A+B	896.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (2540B)	572.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ 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 <sub>3</sub> (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, 23 <sup>rd</sup> 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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	49.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>3</sub> (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, 23 <sup>rd</sup> 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, 23 <sup>rd</sup> 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 : 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 ( $\mu$ mhos/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 <sub>3</sub> (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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	44.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>3</sub> (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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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(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)	31.0	10-100	-	-
3.	Electrical Conductivity (µmhos/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, 4500H+ 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 <sub>3</sub> (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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	35.75	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>3</sub> (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 (0C)	APHA,23rd Ed.2017, (2550 A+B)	30.50	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA,23 <sup>rd</sup> Ed.2017, 2510-A+B	840.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA,23 <sup>rd</sup> 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, 2320 A+ B	204.0	5-1500	200	600
7.	Total Hardness as CaCO <sub>3</sub> (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, 23 <sup>rd</sup> 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 <sub>4</sub> (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	39.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO <sub>3</sub> (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, 23 <sup>rd</sup> 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, 23 <sup>rd</sup> 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.

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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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Analyst

*Reena*  
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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,23 <sup>rd</sup> Ed.2017,4500H+A+B,	7.36	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 <sup>rd</sup> Ed. 2017, 2130-A+B	13.50	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (2540C)	664.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (4500 A+C)	6.5	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 4500 Cl A+B	56.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (4500 -C)	0.54	0.05-10	1.5
8.	Sulfate as SO <sub>4</sub> (mg/l)	APHA,23 <sup>rd</sup> Ed.2017 (4500 -SO <sub>4</sub> <sup>2-</sup> 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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FORMAT NO. ECO/QS/FORMAT/07

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

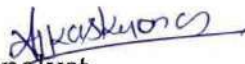
TEST REPORT ISSUE DATE: 04.06.2021

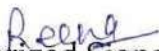
## TEST REPORT OF SURFACE WATER

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, Down Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23 <sup>rd</sup> Ed. 2017, 4500H+A+B,	7.62	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 <sup>rd</sup> Ed. 2017, 2130-A+B	10.50	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017 (2540C)	676.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017 (4500 A+C)	5.6	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 4500 Cl A+B	58.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017 (4500 - C)	0.56	0.05-10	1.5
8.	Sulfate as SO <sub>4</sub> (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017 (4500 -SO <sub>4</sub> <sup>2-</sup> 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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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, 23<sup>rd</sup> 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, 23rd Ed. 2017, 4500H' A+B	7.64	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	21.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	646.0	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	10.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd 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 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, 23<sup>rd</sup> 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	5-50000	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, 23<sup>rd</sup> 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 Pit Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 <sup>rd</sup> Ed. 2017, 4500H' A+B	7.50	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	12.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	590.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	9.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> 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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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, 23<sup>rd</sup> 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, 23 <sup>rd</sup> Ed. 2017, 4500H <sup>1</sup> A+B	7.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	16.8	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	610.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	8.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> 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, 23<sup>rd</sup> 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

\*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, 23<sup>rd</sup> 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, 23 <sup>rd</sup> Ed. 2017, 4500H <sup>1</sup> A+B	7.21	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	42.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	860.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	11.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	96.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

*Ravi Bhargava*  
Analyst

*Ravi Bhargava*  
Authorized Signatory  
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Ph.2746282 Fax-2745726

*Abhishek*  
Quality Manager



# ECOMEN LABORATORIES PVT. LTD.

Flat No. 8, 2nd Floor, Arif Chamber-V, Sector H, Aliganj, Lucknow - 226 024

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

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TEST REPORT ISSUE DATE: 04.06.2021

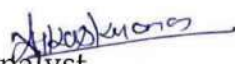
## TEST REPORT OF WASTE WATER\*

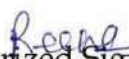
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)  
Address of the Customer : Jamadoba,  
Distt. Dhanbad - 828 112  
Sampling Method : APHA, 23<sup>rd</sup> Ed. 2017  
Sample Collected by : Mr. Arvind Singh  
Sample Quantity : As per requirement  
Date of Sampling : 24.05.2021 to 28.05.2021  
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, 23 <sup>rd</sup> Ed. 2017, 4500H' A+B	8.56	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	162.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	936.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017,5210 A+B	23.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	156.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

  
Analyst

  
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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, 23<sup>rd</sup> 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, 23 <sup>rd</sup> Ed. 2017, 4500H' A+B	7.52	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	47.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	890.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	14.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	72.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

*Abhishek*  
Analyst

*Reena*  
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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, 23<sup>rd</sup> 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	5-600
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

\*The result are related only to item tested.

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*Ashish Kumar*  
Analyst

*Reena*  
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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, 23<sup>rd</sup> 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, 23 <sup>rd</sup> Ed. 2017, 4500H <sup>1</sup> A+B	7.18	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	39.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	780.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	20.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	76.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

*Shikhar*  
Analyst

*Reena*  
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*Abhishek*  
Quality Manager

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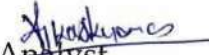
## TEST REPORT OF WASTE WATER\*


**Name of the Customer** : M/s Tata Steel Ltd. (Jamadoba Group)  
**Address of the Customer** : Jamadoba,  
Distt. Dhanbad - 828 112  
**Sampling Method** : APHA, 23<sup>rd</sup> 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

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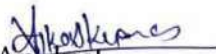
## TEST REPORT OF WASTE WATER\*

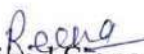
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)  
Address of the Customer : Jamadoba,  
Distt. Dhanbad - 828 112  
Sampling Method : APHA, 23<sup>rd</sup> Ed. 2017  
Sample Collected by : Mr. Arvind Singh  
Sample Quantity : As per requirement  
Date of Sampling : 24.05.2021 to 28.05.2021  
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, 23 <sup>rd</sup> Ed. 2017, 4500H <sup>1</sup> A+B	7.46	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	38.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	748.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	18.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	78.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

  
Analyst

  
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Quality Manager

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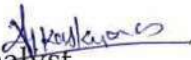
## TEST REPORT OF WASTE WATER\*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)  
Address of the Customer : Jamadoba,  
Distt. Dhanbad - 828 112  
Sampling Method : APHA, 23<sup>rd</sup> 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, 4500H' A+B	7.59	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	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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## TEST REPORT OF WASTE WATER\*

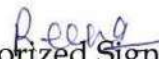
**Name of the Customer** : M/s Tata Steel Ltd. (Jamadoba Group)  
**Address of the Customer** : Jamadoba,  
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**Sampling Method** : APHA, 23<sup>rd</sup> Ed. 2017  
**Sample Collected by** : Mr. Arvind Singh  
**Sample Quantity** : As per requirement  
**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, 23 <sup>rd</sup> Ed. 2017, 4500H' A+B	7.35	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	34.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	1136.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017,5210 A+B	22.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	86.0	5-50000	250.0

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Analyst

  
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Quality Manager



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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, 23<sup>rd</sup> 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 <sup>1</sup> A+B	8.15	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	160.0	5-5000
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

  
Authorized Signatory  
Ecomen Laboratories Pvt. Ltd.  
Flat No.8 Second Floor Arif Chamber  
Sector-H, Aliganj, Lucknow-226024  
Ph.2746282 Fax-2745726

  
Quality Manager

# ECOMEN LABORATORIES PVT. LTD.

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

**ecoMen**  
LABORATORIES PVT LTD.

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, 23<sup>rd</sup> 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, 23 <sup>rd</sup> Ed. 2017, 4500H' A+B	7.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540D	42.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 2540C	824.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 <sup>rd</sup> Ed. 2017, 5210 A+B	17.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 <sup>rd</sup> Ed. 2017, 5220 A+B	80.0	5-50000	250.0

\*The result are related only to item tested.

BDL = Below Detection Limit

*Analyst*  
Analyst

*Authorized Signatory*  
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*Quality Manager*  
Quality Manager

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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/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 <sub>2</sub> )	Ferrous oxide (FeO)	Alumina (Al <sub>2</sub> O <sub>3</sub> )	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

*Ravi Bhargava*  
Analyst

*Ravi Bhargava*  
Authorized Signatory  
Ecomen Laboratories Pvt. Ltd.  
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Ph.2746282 Fax-2745726

*Abhishek*  
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)**



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Website: aditirndservices.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 <sup>0</sup> C	Avg. Humidity	72%
Sl No.	Particulars	Value	CPCB STANDARD	
1.	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	89.96	100 µg/m <sup>3</sup>	
2.	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	40.61	60 µg/m <sup>3</sup>	
3.	SO <sub>2</sub> , µg/m <sup>3</sup>	21.73	80 µg/m <sup>3</sup>	
4.	NO <sub>2</sub> , µg/m <sup>3</sup>	27.29	80 µg/m <sup>3</sup>	
5.	Ozone, µg/m <sup>3</sup>	21.10	180 µg/m <sup>3</sup>	
6.	NH <sub>3</sub> , µg/m <sup>3</sup>	19.82	400 µg/m <sup>3</sup>	
7.	CO, mg/m <sup>3</sup>	1.12	4 mg/m <sup>3</sup>	
8.	Pb, µg/m <sup>3</sup>	BDL	1 µg/m <sup>3</sup>	
9.	As, ng/m <sup>3</sup>	BDL	6 ng/m <sup>3</sup>	
10.	Ni, ng/m <sup>3</sup>	BDL	20 ng/m <sup>3</sup>	
11.	Benzene, µg/m <sup>3</sup>	BDL	5 µg/m <sup>3</sup>	
12.	Benzoapyrene ng/m <sup>3</sup>	BDL	1 ng/m <sup>3</sup>	

NOTE: BDL - Below Detection Limit

*S. R. Rishy*  
Sr. Chemist  
Aditi R&D Services



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

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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%
1.	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	86.98	100 µg/m <sup>3</sup>
2.	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	53.10	60 µg/m <sup>3</sup>
3.	SO <sub>2</sub> , µg/m <sup>3</sup>	16.65	80 µg/m <sup>3</sup>
4.	NO <sub>2</sub> , µg/m <sup>3</sup>	29.76	80 µg/m <sup>3</sup>
5.	Ozone, µg/m <sup>3</sup>	18.6	180 µg/m <sup>3</sup>
6.	NH <sub>3</sub> , µg/m <sup>3</sup>	15.2	400 µg/m <sup>3</sup>
7.	CO, mg/m <sup>3</sup>	1.72	4 mg/m <sup>3</sup>
8.	Pb, µg/m <sup>3</sup>	BDL	1 µg/m <sup>3</sup>
9.	As, ng/m <sup>3</sup>	BDL	6 ng/m <sup>3</sup>
10.	Ni, ng/m <sup>3</sup>	BDL	20 ng/m <sup>3</sup>
11.	Benzene, µg/m <sup>3</sup>	BDL	5 µg/m <sup>3</sup>
12.	Benzoapyrene ng/m <sup>3</sup>	BDL	1 ng/m <sup>3</sup>

NOTE: BDL - Below Detection Limit

Sr. Chemist  
Aditi R&D Services



Technical Manager  
Aditi R&D Services, Sindri

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Mobile: 09471358492, 09431512608

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

Date: 10.08.2021

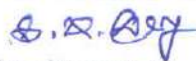
## TEST REPORT OF AMBIENT AIR QUALITY

- 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 <sub>10</sub> ), µg/m <sup>3</sup>	76.83	100 µg/m <sup>3</sup>	
2.	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	41.00	60 µg/m <sup>3</sup>	
3.	SO <sub>2</sub> , µg/m <sup>3</sup>	15.16	80 µg/m <sup>3</sup>	
4.	NO <sub>2</sub> , µg/m <sup>3</sup>	27.22	80 µg/m <sup>3</sup>	
5.	Ozone, µg/m <sup>3</sup>	19.94	180 µg/m <sup>3</sup>	
6.	NH <sub>3</sub> , µg/m <sup>3</sup>	16.53	400 µg/m <sup>3</sup>	
7.	CO, mg/m <sup>3</sup>	0.74	4 mg/m <sup>3</sup>	
8.	Pb, µg/m <sup>3</sup>	BDL	1 µg/m <sup>3</sup>	
9.	As, ng/m <sup>3</sup>	BDL	6 ng/m <sup>3</sup>	
10.	Ni, ng/m <sup>3</sup>	BDL	20 ng/m <sup>3</sup>	
11.	Benzene, µg/m <sup>3</sup>	BDL	5 µg/m <sup>3</sup>	
12.	Benzoapyrene ng/m <sup>3</sup>	BDL	1 ng/m <sup>3</sup>	

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/21-22/2650

Date: 10.08.2021

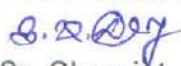
## TEST REPORT OF AMBIENT AIR QUALITY

- 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 <sup>o</sup> C	Avg. Humidity	71%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	88.2	100 µg/m <sup>3</sup>	
2.	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	42.52	60 µg/m <sup>3</sup>	
3.	SO <sub>2</sub> , µg/m <sup>3</sup>	18.68	80 µg/m <sup>3</sup>	
4.	NO <sub>2</sub> , µg/m <sup>3</sup>	24.27	80 µg/m <sup>3</sup>	
5.	Ozone, µg/m <sup>3</sup>	18.1	180 µg/m <sup>3</sup>	
6.	NH <sub>3</sub> , µg/m <sup>3</sup>	19.53	400 µg/m <sup>3</sup>	
7.	CO, mg/m <sup>3</sup>	1.01	4 mg/m <sup>3</sup>	
8.	Pb, µg/m <sup>3</sup>	BDL	1 µg/m <sup>3</sup>	
9.	As, ng/m <sup>3</sup>	BDL	6 ng/m <sup>3</sup>	
10.	Ni, ng/m <sup>3</sup>	BDL	20 ng/m <sup>3</sup>	
11.	Benzene, µg/m <sup>3</sup>	BDL	5 µg/m <sup>3</sup>	
12.	Benzoapyrene ng/m <sup>3</sup>	BDL	1 ng/m <sup>3</sup>	

NOTE: BDL - Below Detection Limit

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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## TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

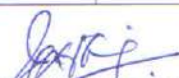
Ref. No. & Date	NAME AND ADDRESS OF THE CLIENT			
ARDS/21-22/2651 Date:10.08.2021	M/S TATA STEEL, JAMADOBA,			
Date of Monitoring	TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)			
06.08.2021 – 07.08.2021	Avg. Ambient Temperature(°C)	Average Humidity (%)	Weather Condition	Status of the plant
Work Order 4700092573/932 Dt. 20.07.2021	29	68	Clear	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
LOCATION								Industrial Area	Industrial Area
JAMADOBA GROUP									
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	52.6	50.2	51.49	50.9	46.7	49.29		
								Residential Area	Residential Area
4.	Officer Colony 12 No. Digwadih	50.5	46.8	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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Ref. No.: - ARDS/21-22/2791

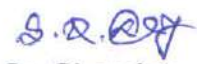
Date: 18.08.2021

## 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 <sub>2</sub>	FeO	Al <sub>2</sub> O <sub>3</sub>	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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Mobile: 09471358492, 09431512608

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, SO<sub>4</sub>

### 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 <sub>4</sub> , mg/l	42.12	60.24	400	IS-3025 (P-24):1986

*S. R. Ray*  
Sr. Chemist  
Aditi R&D Services



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

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Mobile: 09471358492, 09431512608

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


Date: 18.08.2021

## TEST REPORT OF MINE WATETR 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	10.6	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

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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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 <sup>st</sup> 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

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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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 <sub>3</sub> , 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 <sub>2</sub> 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 <sub>3</sub> , 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	Permissibl e	
12.	Manganese as Mn, mg/l	BDL	BDL	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO <sub>4</sub> , mg/l	42	56	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO <sub>3</sub> , 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 <sub>6</sub> H <sub>5</sub> 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 <sub>3</sub> , 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.	Boran 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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Mobile: 09471358492, 09431512608

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 :
  1. Bhowra 13 No
  2. Mohalbani Basti
  3. Lower Dungari
  4. Jorapokhar Kushtand
  5. 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 Kushland	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, µmhos/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 <sub>3</sub> , 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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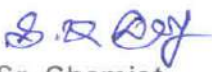
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2

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Bhowra 13 No	Mohalban i Basti	Lower Dungari	Jorapokhar Kushtand	Jamadoha 3 No	Desirable	Permissible	
11	Sulphate as SO <sub>4</sub> , mg/l	40.4	38.5	38.2	44.1	38.5	200	400	IS 3025(P-24):1986
12	Nitrate as NO <sub>3</sub> , mg/l	12.6	16.3	7.25	12.6	10.5	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO <sub>3</sub> , 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 3025(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
23	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

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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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,  
TATA STEEL LIMITED  
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

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/2797

Date: 18.08.2021

## TEST REPORT OF ETP

- 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 : 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

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


Date: 18.08.2021

## TEST REPORT OF STP

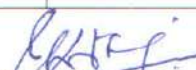
- Name of the industry : M/S TATA STEEL, JAMADOBA,  
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JAMADOBA GROUP PLANT,  
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : STP – RAILWAY COLONY (Inlet and Outlet)
- Date of Sample Collection: 07.08.2021
- 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	
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

  
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### Statements :

- The test report refers only to the particular item(s) submitted for testing.
- The test results reported in this report are valid at the time of and under the stated condition of measurement.
- This particular test report cannot be reproduced except in full without prior permission of Quality Manager of the laboratory.