



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/ 397 /2021

May 28, 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 October'20 to March'21

Dear Sir,

We are enclosing herewith compliance report for the period **October'20 to March'21** for the EC granted vide letter no.- J-11015/252/2005-IA.II(M), Dated-22nd June 2006 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

Copy of the compliance report is also being sent in soft format through email at ro.ranchi-mef@gov.in for your kind perusal. We trust the information furnished is in line with your requirement.

Thanking you,

Yours faithfully,

Head (Planning)
Jharia Division, Tata Steel Ltd.

Encl: As above.

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

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

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

TATA STEEL LIMITED

Jharia Collieries Jamadoba 828 112 Dhanbad India

Tel 91 326 2320263/2320265/2320267 Fax 91 326 2320268

Head Office Bombay House 24 Homi Modi Street East Mumbai 400 001

**HALF YEARLY COMPLIANCE REPORT
(PERIOD: OCTOBER'20 – MARCH'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- 22ND 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
Specific Condition:		
(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 has been taking place since Nov'2014. Now backfilling of the mine void by the OB is going on which is expected to be completed by Mar'22.
(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 cease since Nov'14. After backfilling of mine void, top soil will be 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 is 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 is being used for backfilling the mine pit as part of our mine closure plan.
(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.	We are utilising the external OB to backfill the mine voids. The whole area including void and dump area is being reclaimed and plantation will be done after backfilling jobs are over.
(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.	Around 1 Ha area was backfilled when the mine was in operation. The remaining area has also been taken up for backfilling and subsequent restoration to original land-use as per approved mining plan. The mine closure plan 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, water level & quality of groundwater is regularly analysed as required (Annexure-I)
(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.	Construction of new ponds and renovation of old ponds is a continuous process and is being done through TSRDS , the CSR wing of Tata Steel for collection of rain water and mine water . These water is being utilised by the communities and also helps in recharging the ground water.
(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.
(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 upto 30.09.2022.
General Conditions:		
(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 since Nov'14.
(i)	No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.	All mining excavation activities are terminated since Nov'14.

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

(ii)	Four Ambient Air quality monitoring station should be established in the core zones as well as in the buffer zone SPM, RSPM, SO ₂ and NO _X monitoring location of the stations should be decided based on the metrological data & topographical features & environmentally & ecologically sensitive targets in consultation with SPCB.	The operations have now ceased. The ambient air monitoring is done at 4 locations and the reports are attached as Annexure-I
(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. Backfilling of OB into mine void is going on and water sprinkling on transport roads is being done regularly. Fugitive dust emission is monitored and recorded.
(iv)	Data on ambient air quality (SPM, RSPM, SO _x & NO _x) 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. The report is attached as Annexure-I
(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 M/s Ecomen Laboratories Pvt Ltd., an NABL and MoEF&CC recognised laboratory
(ix)	Personnel working in dusty area should wear protective respiratory devices and they should also be provided with adequate	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

	training and information on safety and health aspect. Occupational Health Surveillance programme of the worker should be undertaken 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 expenditure is incurred in back filling of the mine void, dust suppressions and greengren belt etc. The environment expenditure for FY 21 is /- 2.684 Crores.
(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.

Environment Quality Report

Annexure- I

AMBIENT AIR QUALITY REPORT

Core zone & Buffer zone

Period- October'20 to December'20

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	RSPM	SO ₂	NO _x
				24 Hourly Limit- 700 µg/m ³	24 Hourly Limit- 300 µg/m ³	24 Hourly Limit- 120 µg/m ³	24 Hourly Limit-120 µg/m ³
Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	08.10.20	Cloudy	176.8	84.9	14.7	15.3
		17.11.20	Clear	215.6	87.5	15.2	14.0
		07.12.20	Cloudy	198.8	86.9	14.4	13.8
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10	PM2.5	SO ₂	NO ₂
				24 Hourly Limit100µg/m ³	24 Hourly Limit60µg/m ³	24 Hourly Limit80µg/m ³	24 Hourly Limit80µg/m ³
Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	27.10.20	Rainy	86.4	50.2	14.1	14.8
		18.11.20	Clear	85.4	52.5	14.7	13.2
		23.12.20	Clear	87.2	49.7	13.6	14.2
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	05.10.20	Clear	85.7	46.7	11.8	12.2
		23.11.20	Clear	85.5	48.7	13.5	13.0
		21.12.20	Cloudy	84.8	43.6	12.3	13.6
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	23.10.20	Rainy	85.3	48.6	10.8	11.4
		19.11.20	Clear	86.5	48.4	12.6	12.5
		10.12.20	Clear	87.4	46.5	13.1	12.8



Sr. Manager (Environment)

Environment Quality Report

Annexure- I

AMBIENT AIR QUALITY REPORT

Core zone & Buffer zone

Period- January'21 to March'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 ³	RSPM 24 Hourly Limit- 300 µg/m ³	SO ₂ 24 Hourly Limit- 120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
Jamadoba Group Office	23°42'15.3"	18.01.21	Clear	186.2	84.9	15.7	14.2
	N/ 86°24'11" E	22.02.21	Clear	224.6	92.4	14.2	13.1
		08.03.21	Clear	215.7	89.6	15.8	13.9
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10 24 Hourly Limit100µg/m ³	PM2.5 24 Hourly Limit60µg/m ³	SO ₂ 24 Hourly Limit80µg/m ³	NO ₂ 24 Hourly Limit- 80µg/m ³
Digwadih 12 No. Colony	23°41'42"	05.01.21	Clear	84.2	45.8	12.6	13.1
	N/ 86°24'45.3"	04.02.21	Clear	82.3	40.8	11.6	12.4
	E	03.03.21	Clear	87.9	42.1	13.6	12.7
New Village Colony, Jamadoba	23°41'51"	04.01.21	Clear	86.8	44.3	11.4	12.2
	N/ 86°23'19" E	10.02.21	Clear	89.4	43.6	12.8	13.5
		10.03.21	Clear	92.8	48.3	11.4	12.6
6&7 Pits Kalimandir colony	23°43'15"	06.01.21	Clear	88.4	49.5	12.6	12.1
	N/ 86°24'12" E	17.02.21	Clear	92.7	46.5	10.4	11.2
		02.03.21	Clear	89.4	43.5	12.3	13.4



Sr. Manager (Environment)

Environment Quality Report

Annexure- I

Ground Water Quality Analysis (Hand Pump & Dug Well)

(Post- Monsoon Season- November'2020)

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity, $\mu\text{S/m}$	Total Hardness (as CaCO_3), mg/l
1	06.11.20	Purnadih (Jorapokhar)	12:20 PM	4.78	7.4	758	542
2	06.11.20	Bhowra 13 No	12:05 PM	2.10	7.2	648	552
3	06.11.20	Mohalbani Basti	01:45 PM	6.50	7.2	722	584
4	06.11.20	Digwadih 12 No	01:58 PM	3.12	7.1	580	816
5	06.11.20	Digwadih 10 No F & J	02:18 PM	2.63	7.3	1030	584
6	06.11.20	Kalimela Shivmandir	11:30 AM	2.03	7.2	799	682
7	06.11.20	Kalimela Kalimandir	11:40 AM	2.84	7.2	788	564
8	06.11.20	Lower Dungari	11:15 AM	3.48	7.3	619	532
9	06.11.20	Upper Dungari	10:55 AM	2.32	7.2	698	528
10	06.11.20	Pattia Basti	10:25 AM	2.48	7.3	692	706
11	06.11.20	Kenduadih Basti	10:10 AM	1.98	7.1	724	586
12	06.11.20	Jorapokhar Kushtand	12:40 PM	3.65	7.3	742	602
13	06.11.20	Jamadoba 3 No	09:35AM	3.12	7.1	720	584
14	06.11.20	6&7 Pits (Ayodhya Nagri)	01:25 PM	2.88	7.2	668	622



Sr. Manager (Environment)

Environment Quality Report

Annexure- I

Ground Water Quality Analysis (Hand Pump & Dug Well)

(Winter Season- January'2021)

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$	Total Hardness(as CaCO_3),mg/l
1	07.01.21	Purnadih (Jorapokhar)	09:40 AM	5.10	7.3	768	548
2	07.01.21	Bhowra 13 No	10:15 AM	2.28	7.4	652	546
3	07.01.21	Mohalbani Basti	10:45 AM	6.64	7.1	748	588
4	07.01.21	Digwadih 12 No	11:05 AM	3.48	7.2	584	812
5	07.01.21	Digwadih 10 No F & J	11:30 AM	2.98	7.3	1028	586
6	07.01.21	Kalimela Shivmandir	01:10 PM	2.26	7.4	812	688
7	07.01.21	Kalimela Kalimandir	01:25 PM	2.98	7.5	782	552
8	07.01.21	Lower Dungari	01:50 PM	3.62	7.2	630	546
9	07.01.21	Upper Dungari	02:20 PM	2.63	7.3	720	532
10	07.01.21	Pattia Basti	02:45 PM	2.62	7.4	706	686
11	07.01.21	Kenduadih Basti	03:10 PM	2.12	7.2	732	590
12	07.01.21	Jorapokhar Kushtand	09:15 AM	3.74	7.1	764	610
13	07.01.21	Jamadoba 3 No	04:00 PM	3.42	7.0	724	588
14	07.01.21	6&7 Pits (Ayodhya Nagri)	12:05 PM	2.92	7.1	672	568



Sr. Manager (Environment)

ECOMEN LABORATORIES PVT. LTD.

ecoMen
LABORATORIES PVT. LTD.

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E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAACE6076H1Z1

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-1/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 13.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	47.5	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	92.5	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	23.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	30.5	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	17.5	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	18.8	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.05	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. **Note:** Below Detection Limit


Analyst


Authorized Signatory


Quality Manager

Ecomen Laboratories Pvt Ltd

ECOMEN LABORATORIES PVT. LTD.

ecoMen
LABORATORIES PVT. LTD.

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E-mail: ravi.bhargava@gmail.com, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAAACE6076H1Z1

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-2/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 08.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : Officers Colony, 12 No. Digwadih

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.5	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	88.6	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	18.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	36.3	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	17.8	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	20.6	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.8	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.


Analyst


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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/11/20

TEST REPORT ISSUE DATE: 11.12.2020


TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 09.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : General Manager's Office Area

No.	Sl.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.		PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	40.5	12.5-1000	60
2.		PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	83.6	12.5-1000	100
3.		SO ₂ (µg/m ³)	IS:5182 (Part-2)	18.5	9-200	80
4.		NO ₂ (µg/m ³)	IS:5182 (Part-6)	32.4	6-200	80
5.		NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	13.7	2-700	400
6.		O ₃ (µg/m ³)	IS:5182(Part-9)	18.6	2-200	180
7.		CO (mg/m ³)	IS:5182 (Part-10)	1.65	0.2-500	04
8.		Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.		Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.		Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.		As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.		Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/11/20
TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 12.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : Jamadoba Colliery

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.5	12.5-1000	60
2.	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-23)	80.5	12.5-1000	100
3.	SO ₂ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-2)	15.3	9-200	80
4.	NO ₂ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-6)	18.8	6-200	80
5.	NH ₃ ($\mu\text{g}/\text{m}^3$)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	32.8	2-700	400
6.	O ₃ ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-9)	19.6	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.04	0.2-500	04
8.	Pb($\mu\text{g}/\text{m}^3$)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr ($\mu\text{g}/\text{m}^3$)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd ($\mu\text{g}/\text{m}^3$)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.

Ravi Bhargava
Analyst

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Abhishek
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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AN/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
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	11.11.2020	69.3	56.8	58.1	63.5	50.5	54.0
2.	Officer's Colony, 12 No, Digwadih	11.11.2020	60.8	54.1	56.3	49.8	45.3	47.2
3.	General Manager's Office Area	09.11.2020	54.2	48.9	51.4	47.4	41.4	43.0
4.	Jamadoba Colliery	11.11.2020	71.7	55.6	67.5	67.5	50.3	53.6

Noise (Ambient Standard)

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

Note:

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


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FORMAT NO. ECO/QS/FORMAT/10 TEST REPORT NO: ECO LAB/MCPM/11/20
TEST REPORT ISSUE DATE: 11.12.2020

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 : November, 2020

S.NO.	Locations	Date of Sampling	Mineralogical Composition (in %)			
			Silica (SiO ₂)	Ferrous oxide (FeO)	Alumina (Al ₂ O ₃)	Calcium Oxide CaO
1	Central Workshop Area, Jamadoba	09.11.2020	2.7	0.19	1.38	2.84
2	Officer's Colony, 12 No Digwadih	10.11.2020	1.64	0.08	1.41	2.88

Ravi Bhargava
Analyst

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20
TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Jamadoba Canteen
Sample ID Code : ELW-12619

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, 2130 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	1.51	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.18	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	685.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	192.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	294.0	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	0.21	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	20.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	43.1	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	9.22	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.30	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	0.26	0.02-80	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	0.25	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 ₁₂ H ₁₀ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil (mg/l)	APHA, 23rd Ed. 2017, Class-4 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	0.27	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	18	Absent	Absent

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

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Digwadih Club
Sample ID Code : ELW-12620

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, 2120 A+B	1.26	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500B+ 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	651.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	188.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	64.0	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	0.26	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	36.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	41.1	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	12.02	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-F	0.30	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	0.05	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	0.5-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.22	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1.0	Absent	Absent

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

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Purnadih (Jorapokhar)
Sample ID Code : ELW-12623

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per 15 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, (2950 A+B)	27.3	10-100	-	-
3.	Electrical Conductivity ($\mu\text{mhos/cm}$)	APHA, 23rd Ed. 2017, 2510-A+B	932.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	639.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	220.0	5-1500	200	600
7.	Total Hardness as CaCO_3 (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	240.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	62.6	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	0.13	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	80.0	5-1000	250.0	1000.0
13.	Sulfate as SO_4 (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	63.5	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO_3 (mg/l)	APHA, 23rd Ed. 2017, 4500- NO_3^- B	10.2	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.40	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.10	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.

BDL = Below Detection Limit.


Analyst


Authorized Signatory


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Digwadih 10 No, F&J
Sample ID Code : ELW-12624

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	768.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	520.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.62	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	196.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	228.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.8	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	23.32	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	0.23	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	70.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	55.01	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.21	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.39	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	0.13	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


Analyst


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020


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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Kalimela Kalimandir
Sample ID Code : ELW-12625

Sl. No.	TESTS	PROYOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.7	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	812.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	505.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.37	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	176.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	192.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	48.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	17.49	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	0.16	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	48.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	54.27	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	9.99	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.69	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	0.09	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


Analyst


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Upper Dungari
Sample ID Code : ELW-12626

SL No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff.2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.1	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1020.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	695.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.50	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	216.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	240.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	65.6	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	18.46	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	0.20	0.02-30	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	64.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	60.2	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	15.3	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	0.20	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


Analyst


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Kenduadih Basti
Sample ID Code : ELW-12627

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	27.3	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	617.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	433.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.20	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	196.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	49.6	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	21.38	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.26	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	38.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	36.21	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.11	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	0.09	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


Analyst


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 6&7 Pits (Ayodhya Nagar)
Sample ID Code : ELW-12628

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, 2130 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510 A+B	796.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	524.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.39	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	220.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	67.2	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	23.32	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	0.16	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	58.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	42.05	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	13.95	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.67	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.22	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Damodar River, Up Stream
Sample ID Code : ELW-12601

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23rd Ed. 2017 (4500H+A+B)	7.34	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	11.0	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017 (2540C)	635.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23rd Ed. 2017 (4500 A+C)	6.5	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23rd Ed. 2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	50.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017 (4500 -C)	0.55	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	46.2	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


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

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. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Damodar River, Down Stream
Sample ID Code : ELW-12602

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23rd Ed. 2017, 4500H+A+B,	7.67	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	14.0	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017 (2540C)	679.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23rd Ed. 2017 (4500 A+C)	5.8	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23rd Ed. 2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	60.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017 (4500 - C)	0.55	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	53.6	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

Ravi Bhargava
Analyst

Ravi Bhargava
Authorized Signatory

Ravi Bhargava
Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 2Pit Jamadoba Colliery
Sample ID Code : ELW-12609

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4900H A+B	7.76	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	15.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	622.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	34.0	5-50000	250.0

*The result are related only to item tested.

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TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 2 Incline Jamadoba Colliery
Sample ID Code : ELW-12610

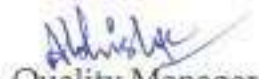
Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.49	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	13.6	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	591.0	10-10,000	-
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	9.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	20.0	5-50000	250.0

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 6&7 Pit Colliery
Sample ID Code : ELW-12611

SL No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H A+B	8.11	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	9.63	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	746.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	6.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	28.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

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TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Digwadih Colliery
Sample ID Code : ELW-12612

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.53	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	14.1	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	678.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5620 (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	7.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	24.0	5-50000	250.0

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TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : JCPP (Final Settling Pond)
Sample ID Code : ELW-12613

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23rd Ed. 2017, 4500H A+B	8.20	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	17.4	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	925.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	6.53	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	11.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	32.0	5-50000

*The result are related only to item tested.

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TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : T.C.H Point -1 (Near Children's Ward)
Sample ID Code : ELW-12614

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4900H A+B	7.06	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	43.6	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	822.0	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	13.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	96.0	5-50000	250.0

*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/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

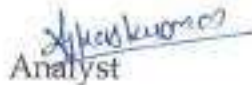
TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Virendra Pandey
 Sample Quantity : As per requirement
 Date of Sampling : 10.11.2020 to 12.11.2020
 Date of Sample Receiving : 18.11.2020
 Date of Analysis : 18.11.2020 to 02.12.2020
 Source of Sample : ETP Inlet Jamadoba Canteen
 Sample ID Code : ELW-12634

Sl No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	8.23	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	148.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	933.0	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) 5days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	25.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	158.0	5-50000	250.0

*The result are related only to item tested.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet Jamadoba Canteen
Sample ID Code : ELW-12635

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500F A+B	7.59	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	42.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	861.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	14.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	63.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


Authorized Signatory


Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

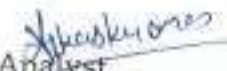
TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Inlet JCPP canteen
Sample ID Code : ELW-12636

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.49	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	134.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1124.0	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	28.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	160.0	5-50000

*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/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet JCPP canteen
Sample ID Code : ELW-12637

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.05	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	32.55	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	756.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	17.0	5-30000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	74.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Virendra Pandey
 Sample Quantity : As per requirement
 Date of Sampling : 10.11.2020 to 12.11.2020
 Date of Sample Receiving : 18.11.2020
 Date of Analysis : 18.11.2020 to 02.12.2020
 Source of Sample : ETP Inlet TCH
 Sample ID Code : ELW-12638

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	6.90	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	131.4	5-8000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	784.0	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	29.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	180.0	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/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Virendra Pandey
 Sample Quantity : As per requirement
 Date of Sampling : 10.11.2020 to 12.11.2020
 Date of Sample Receiving : 18.11.2020
 Date of Analysis : 18.11.2020 to 02.12.2020
 Source of Sample : ETP Outlet TCH
 Sample ID Code : ELW-12639

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.51	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1002.0	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	19.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	80.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Virendra Pandey
 Sample Quantity : As per requirement
 Date of Sampling : 10.11.2020 to 12.11.2020
 Date of Sample Receiving : 18.11.2020
 Date of Analysis : 18.11.2020 to 02.12.2020
 Source of Sample : ETP Inlet Garage
 Sample ID Code : ELW-12640

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.45	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	177.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	916.0	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	176.0	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/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet Garage
Sample ID Code : ELW-12641

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.38	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	30.62	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1110.0	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	21.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	84.0	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/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : STP Inlet Railway Colony
Sample ID Code : ELW-12642

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	8.20	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	149.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	815.0	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	44.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	374.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit



Analyst



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FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20
TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : STP Outlet Railway Colony
Sample ID Code : ELW-12643

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.35	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	46.3	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	796.0	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	16.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	70.0	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/10

TEST REPORT NO: ECO LAB/AAQ-1/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 08.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	44.8	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	85.5	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	20.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	28.5	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	16.5	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	18.3	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	0.95	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. **Note:** Below Detection Limit

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Analyst

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-2/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 08.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : Officers Colony, 12 No. Digwadih

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.28	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	88.96	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	18.70	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	34.20	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	22.84	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	21.50	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.82	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.

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Rosna
Authorized Signatory

Rosna
Quality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 09.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : General Manager's Office Area

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.86	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	87.28	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	21.20	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	33.9	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	12.7	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	17.4	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.70	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. **Note:** Below Detection Limit

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Analyst

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 09.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : Jamadoba Colliery

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	39.2	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	81.2	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	14.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	18.2	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	34.6	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	21.2	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.16	0.2-500	04
8.	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.

Archana
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Authorized SignatoryReena
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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AN/03/21

TEST REPORT ISSUE DATE: 09.04.2021

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	08.02.2021	67.5	55.8	57.4	62.8	47.9	53.2
2.	Officer's Colony, 12 No. Digwadih	08.02.2021	57.8	52.9	52.5	48.6	44.2	45.1
3.	General Manager's Office Area	09.02.2021	52.6	48.6	50.2	46.3	40.2	41.3
4.	Jamadoba Colliery	09.02.2021	71.1	54.2	67.2	66.2	47.3	53.2

Noise (Ambient Standard)

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

Note:

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

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/MCPM/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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

: February, 2021

S.NO.	Locations	Date of Sampling	Mineralogical Composition (in %)			
			Silica (SiO ₂)	Ferrous oxide (FeO)	Alumina (Al ₂ O ₃)	Calcium Oxide CaO
1	General Manager's Office Area	09.02.2021	1.72	0.08	1.42	2.96
2	Jamadoba Colliery	09.02.2021	2.80	0.17	1.41	2.89

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	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	1.53	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.24	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	480.9	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2520 A+B	184.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2540 A+C	196.0	5-1500	100.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	45.60	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	0.20	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	32.6	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	45.7	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	9.36	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.33	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	0.28	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+B	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5520 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

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : Digwadih Club

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	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	1.24	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.32	3-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	502.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	180.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 1340 A+C	200.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.80	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	0.27	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	38.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	43.1	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	13.0	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.34	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	0.06	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.24	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1-5	Absent	Absent

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

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Analyst

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 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, (2880 A+B)	30.8	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	946.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	650.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.60	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2120 A+ B	216.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	244.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	59.2	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	23.32	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	0.16	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	82.4	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	66.2	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	10.3	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.91	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	0.12	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

Archan
Analyst

Rocna
Authorized Signatory

Reena
Quality Manager

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LABORATORIES PVT LTD.

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Digwadih 10 No, F&J

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	30.8	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	786.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	528.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.50	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	188.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	236.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	60.80	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	0.05	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	72.6	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	56.8	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	14.08	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.62	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.16	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 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/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 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)	31.3	10-100	-	-
3.	Electrical Conductivity (umhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	816.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	512.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500B+ A+B	7.40	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	180.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	205.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	15.6	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	0.085	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	52.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	56.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.5	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.72	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	0.12	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/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 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)	32.5	10-100	-	-
3.	Electrical Conductivity (umhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1088.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	698.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	208.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	256.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	68.8	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	0.10	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	64.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	48.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	16.8	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	0.18	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/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 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)	30.0	10-100	-	-
3.	Electrical Conductivity (μ mhos/cm)	APHA, 23rd Ed. 2017, 2510 A+B	828.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	480.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.30	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	200.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	220.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	19.44	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.13	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	42.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	38.60	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	20.0	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.63	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	0.12	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/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : 6&7 Pits (Ayodhya Nagar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	32.4	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2810-A+B	818.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	536.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.46	3-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	212.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	282.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	64.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	22.35	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3560 Fe B	0.19	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4560 Cl A+B	62.2	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	43.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	14.26	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.60	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	0.24	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.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Damodar River, Up Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA,23 rd Ed.2017,4500H+A+B,	7.42	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	12.5	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23 rd Ed.2017 (2540C)	654.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,23 rd Ed.2017 (4500 A+C)	6.8	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23 rd Ed.2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	52.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA,23 rd Ed.2017 (4500 -C)	0.58	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA,23 rd Ed.2017 (4500 -SO ₄ E)	36.0	1.0-250	400.0

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

BDL - Below Detection Limit

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TEST REPORT NO: ECO LAB/SW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

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 : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Damodar River, Down Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23 rd Ed. 2017, 4500H+A+B,	7.70	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	11.0	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017 (2540C)	688.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23 rd Ed. 2017 (4500 A+C)	5.9	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23 rd Ed. 2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	63.2	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23 rd Ed. 2017 (4500 - C)	0.52	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23 rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	46.0	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/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : 2Pit 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	7.72	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	20.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	634.0	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	9.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	38.6	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
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, 23 rd Ed. 2017, 4500H A+B	7.53	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	16.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	508.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	12.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	28.0	5-30000	250.0

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TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
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, 23rd Ed. 2017, 4600H A+B	7.6	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	10.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	620.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5320 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	32.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

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TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Digwadih Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H A+B	7.50	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	15.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	580.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	27.5	5-50000	250.0

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : JCPP (Final Settling Pond)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23 rd Ed. 2017, 4500H A+B	7.25	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	18.5	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	915.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	6.48	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	12.3	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	38.2	5-50000

*The result are related only to item tested.

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : T.C.H Point -1 (Near Children's Ward)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.14	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	46.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	840.0	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	12.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	92.3	5-50000	250.0

*The result are related only to item tested.

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TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	8.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	154.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	954.0	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	24.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	162.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
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 rd Ed. 2017, 4500H ⁺ A+B	7.60	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	44.3	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	868.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	15.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	68.6	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

Archan
Analyst

Rosa
Authorized Signatory

Rosa
Quality Manager

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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 : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23 rd Ed. 2017, 4500F A+B	7.54	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	142.0	5-3000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	1156.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	26.8	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	164.3	5-50000

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Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Outlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.11	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34.60	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	764.0	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	19.6	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	78.4	5-50000	250.0

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Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	6.82	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	136.2	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	792.8	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	25.5	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	177.0	5-50000

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BDL = Below Detection Limit

Archan
Analyst

Archan
Authorized Signatory

Archan
Quality Manager

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Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Outlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R. 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.58	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	36.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1016.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	20.8	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	83.2	5-50000	250.0

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BDL = Below Detection Limit

Archana
Analyst

Roona
Authorized Signatory

Roona
Quality Manager

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 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : ETP Inlet Garage

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.53	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	182.0	5-9000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	932.0	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	28.5	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	181.0	5-50000

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AnalystReena
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 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 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 rd Ed. 2017, 4500F A+B	7.43	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	32.80	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	1124.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	23.8	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	82.3	5-50000	250.0

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BDL - Below Detection Limit

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Reena
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Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : STP Inlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23 rd Ed. 2017, 4500F A+B	8.26	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	153.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	822.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	46.3	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	378.2	5-50000

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Archana
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 Source of Sample : STP Outlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.38	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	48.7	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	806.2	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	18.3	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	76.3	5-50000	250.0

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