

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
राउरकेला इस्पात कारखाना
ROURKELA STEEL PLANT
बरसुआ लौह खादान - टेलडिही लौह खादान
BARSUA IRON MINES - TALDHI IRON MINES
P.O. TENSA - 770042
E-mail : gmofficebim@gmail.com



Ref. No. BIM /E&L/2023-24/076

Date: 08.07.2023

To
The Member Secretary,
State Pollution Control Board, Odisha,
A/118, Nilakantha Nagar, Unit-VIII,
Bhubaneswar – 751012

Sub: Environmental Statement for 2022-23 in respect of Barsua-Taldih-Kalta Iron Mines of M/s SAIL.

Sir,

Please find enclosed herewith the Environmental Statement in Form – V for the year 2022-23 in respect of Barsua-Taldih-Kalta Iron Mines of M/s SAIL for your kind perusal.

Thanking You,

Yours faithfully,
For SAIL/Barsua-Taldih-Kalta Iron Mines

Tilak Patnaik
8/7/23

Tilak Patnaik
General Manager I/c, BIM, KIM & Taldih

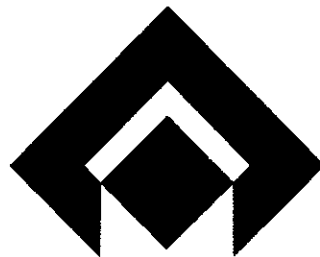
Encl: As Above

Copy to:

1. Deputy Director General of Forests (C),
Ministry of Environment, Forest and Climate Change,
Integrated Regional Office, A/3, Chandrasekharapur,
Bhubaneswar – 751023
2. The Regional Officer,
State Pollution Control Board,
Near Panposh Hockey Chowk, Rourkela -769004

ENVIRONMENTAL STATEMENT

YEAR: 2022-2023



STEEL AUTHORITY OF INDIA LIMITED

BARSUA-TALDIH-KALTA IRON MINES

DISTRICT – SUNDARGARH

ODISHA – 770042

FORM – V

Environmental Statement for the financial year ending 31st March 2023

PART – A

- (i) **Name and address of the owner/occupier of the industry operation or process.** : Barsua-Taldih-Kalta Iron Mines
P.O- Tensa,
Dist. : Sundargarh
Pin- 770042, Odisha
Agent : Shri Tilak Patnaik,
General Manager I/c, BIM, KIM & Taldih
Nominated Owner : Shri Atanu Bhowmick
Director In-Charge, Rourkela Steel Plant,
SAIL.
- (ii) **Industry category Primary - (STC code)** : Open Cast Iron Mine
Secondary - (SIC Code)
- (iii) **Production capacity** : 8.05 MTPA
- (iv) **Year of establishment** : 1960
- (v) **Date of the last environmental statement submitted** : 08.09.2022

PART – B

Water and Raw Material Consumption

- (1) **Water consumption** **m³/day**
- Process 834.24
- Cooling 1113.70 (dust suppression)
- Domestic 4554.96

<i>Name of Products</i>	<i>Process water consumption per unit of product output</i>	
	<i>During the previous financial year (2021-22) in m³/MT</i>	<i>During the Current financial (2022-23) in m³/MT</i>
(1) Washed Iron Ore	0.89	0.81

(2) Raw Material Consumption

Name of raw materials	Name of products	Raw material consumption per unit of product output	
		During the previous financial year (2021-22)	During the Current financial (2022-23)
(1) Diesel (Ltrs)	Iron Ore	3665639	3588150
(2) Lubricant			
a) Lubricant oil (Ltrs)		90182	89990
b) Grease(Kg)		11282	9830
(3) Explosive			
a) Slurry Explosive(Kg)		478094	573899
b) Detonators (Nos)		2183	2955
c) Detonating Fuse(Mtrs)		71100	130525
(4) Power Consumed (Kwh)		18679592	19377181

The ROM production during 2021-22 is 7.180 million tonnes and during 2022-23 is 7.016 million tonnes.

PART - C**Pollution discharged to environment / unit of output**

[Parameter as specified in the consent issued]

Pollutants	Quality of pollutants Discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reason.
a) Water	The Environmental monitoring report is attached in Annexure - I		
b) Air			

PART -D**Hazardous Wastes**

[As specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016]

Hazardous Wastes	Total Quantity(kg)	
	During the previous Financial Year (2021-22)	During the current Financial Year (2022-23)
a) From Process		
• Used / Spent Oil	10.92 KL	13.69 KL
• Waste / Residues containing oil	4.93 T	4.578 T
• Contaminated cotton rags or other cleaning materials.	0.62 T	0.844 T
• Discarded Containers / Barrels / Liners contaminated with Hazardous Wastes / Chemicals	7.73 T	7.584 T

b) From Pollution Control facility <ul style="list-style-type: none"> Waste oil from oil & grease separation pit Sludge from oil & grease separation pit 	Nil (Included in process above)
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**PART – E
Solid Wastes**

Wastes	Total Quantity(Tonnes)	
	During the previous Financial Year (2021-22)	During the current Financial Year (2022-23)
(a) From Process		
(1) Overburden / rejects	26,40,922.00 Ton	24,44,930.00 Ton
(2) Tailings	76,780 Ton	1,49,757 Ton
(b) From Pollution Control facilities	NIL	NIL
(c) (1) Quantity recycled or re-utilized within the unit	1,16,225 Ton	5,19,353.13 Ton
(2) Sold	5,48,727.12 Ton	4,59,915.57 Ton
(3) Disposed	26,01,477.00 Ton	25,94,687.00 Ton

PART –F

Please Specify the characterisation (in terms of compositions and quantum) of Hazardous as well as Solid Wastes and indicate disposal practice adopted for both these category of wastes.

Hazardous Waste Handling and Disposal:

1	Used / Spent Oil	Storage in containers over impervious floor under well ventilated covered shed followed by sale to authorized recycler through auction.
2	Waste / Residues containing oil	Storage in an impervious pit under covered shed followed by final disposal in Authorised Hazardous Waste incinerator / CHWTSDF, Jajpur.
3	Contaminated cotton rags or other cleaning materials.	Storage in an impervious pit / containers under covered shed followed by final disposal in Authorised Hazardous Waste incinerator / CHWTSDF, Jajpur.
4	Discarded Containers / Barrels / Liners contaminated with Hazardous Wastes / Chemicals	Storage in an impervious floor under well ventilated covered shed followed by captive re-use / disposal through authorized vendors.

Solid Waste Handling and Disposal:

These contain high proportions of overburden/mineral rejects in the form of gravel/ boulder and tailings. In the overburden, the Fe content is less than 45% however in mineral rejects the same is between 45-57%. The bulk chemical composition tailing is around 57.67% Fe, 6.29% Al₂O₃, 3.52% SiO₂ and 6.93% LOI.

Disposal practice adopted for solid wastes:

- i) Tailing generated out of washing and jigging operations are allowed to settle in tailing pond. The tailings thus generated are being sold through auction as per the directive of Ministry of Mines, Govt. of India vide order No. F.No. 16/30/2019-M.VI dated 16th September, 2019.
- ii) The Overburden, Mineral reject are being stacked at earmarked sites as per the approved mining plan within the existing broken areas. The mineral rejects are being re-utilized by blending with high grade minerals.

PART – G

Impact of pollution abatement measures taken on conservation of natural resources and on the cost of production.

1. Various mineral conservation techniques are adopted by mine including use of low-grade ore by beneficiation, blending of mineral rejects with high grade ore as per steel plant quality requirements.
2. For conservation of natural resources, high efficiency HEMM are being used with schedule maintenance which keeps the vehicular emission under control and also reduce the fuel consumption.
3. A System for Zero Discharge has been provided at Barsua Iron Mine for recovery and recycling of decanted water from the tailing pond which resulted in reduction of pollution load in the nearby water bodies and reduce the fresh water consumption.
4. Dry fog system has been installed at crushing plant and transfer points which improves the working environment in the plant.
5. Check dam, retaining wall, toe wall, garland drain and settling pit has been constructed for control of surface run-off from the mines which also result in augmentation of ground water.
6. Plantation of 10000 saplings in and around the mines to improve the forest cover.

PART – H

Additional measures/ investment proposal for environmental protection, abatement of pollution, prevention of pollution.

The following additional investment proposals for environmental protection, abatement of pollution, prevention of pollution are under consideration for the mine:

1. Construction of concrete approach road at the entry and exit point of Kalta Iron Mines.
2. Construction of Check dam, garland drain toe walls/ retention wall and settling pit at appropriate places around the mines.
3. De-silting of existing check dams, settling pits.
4. Plantation of 1000 saplings in the Waste Dump and 9000 saplings over non-mineralized area.

5. Construction of rain water harvesting system for recharge of ground water.
6. Procurement of Mist Cannon for fugitive dust suppression.
7. Procurement of Mechanized Road Sweeping Machine for reduction in Dust Re-suspension.
8. Engagement of Protection watchers for protection of forest area in and around the Mining lease.

PART – I

Any other particulars for improving the quality of environment.

1. Celebration of Environment day, Environment week, Environment month, water conservation month, etc to create awareness among employees and villagers.
2. Display of Boards at various locations carrying environmental slogans and environmental parameters.
3. Celebration for Mass awareness by slogans, working models & Cultural Program by employees & school children.



Date: 08.07.2023

**General Manager I/c
Barsua-Taldih-Kalta Iron Mines**

**Tilak Patnaik
GM. I/c. (BIM-TIM-KIM)
SAIL, RSP, BIM**



BARSUA-TALDIH-KALTA IRON MINES

DETAIL ANALYSIS OF AIR QUALITY MONITORING

Location	APRIL 2022					'MAY 2022					'JUNE 2022					'JULY 2022					'AUGUST 2022					'SEPTEMBER 2022				
	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO
Unit	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³

A) Ambient Air Quality in Residential, rural & other areas.

Norm as per NAAQS	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4
A 1	66.96	40.77	8.08	14.66	0.48	62.37	35.12	8.17	16.28	0.58	51.76	26.90	7.87	15.24	0.48	34.05	18.74	6.15	14.17	0.30	38.74	19.93	5.64	12.65	0.36	36.52	18.69	6.30	12.51	0.41
A 2	74.31	51.76	9.77	18.57	0.75	78.53	44.75	9.09	18.54	0.77	66.02	39.58	9.40	18.98	0.67	39.23	22.70	7.04	14.36	0.45	44.07	22.78	5.93	14.20	0.48	46.37	22.25	6.66	16.43	0.58
A 3	56.71	34.70	7.27	15.49	0.45	54.76	31.80	8.27	16.02	0.51	45.95	26.62	6.81	13.71	0.42	36.45	20.13	6.20	13.13	0.29	35.98	16.94	5.51	14.91	0.30	29.48	15.03	5.01	11.72	0.30
A 4	78.65	49.85	9.50	18.20	0.79	82.43	52.76	9.91	19.70	0.84	63.02	36.25	8.73	19.19	0.76	42.99	24.69	6.98	15.34	0.54	43.94	22.02	6.69	17.41	0.57	43.59	20.24	6.34	15.96	0.61

* unit in µg/m³

Note : Ambient Air Quality Monitoring was conducted as per MoEF Notification No. GSR 826(E), dtd.16.11.2009.

B) Results of Fugitive Emission / Work Zone Quality.

Actual(PM)	APRIL 2022		'MAY 2022		'JUNE 2022		'JULY 2022		'AUGUST 2022		'SEPTEMBER 2022	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
F 1	405.5	815.5	356	932.5	296.4	885.7	59.93	627.7	46.2	332.5	52.96	372.8
F 2	448.2	803.5	416	965.8	331.1	930.2	104.5	613.2	54.21	410.1	63.41	387.6
F 3	360.4	972.3	397	905.4	217.3	721.6	64.24	575.3	40.51	305.9	39.34	292.4
F 4	305.8	839.2	397	981.3	292.3	827.7	84.83	612.5	46.36	411.4	45.29	325.3
F 5	227.9	882.3	264	932.4	205.9	870.5	42.52	491.1	46.62	332.7	51.22	316.7
F 6	305.5	1043	432	875.5	215.3	811.6	58.38	557.7	48.85	265.5	52.76	298.9
F 7	627.7	1128	694	1124	308.4	1133	89.32	847.4	76.69	611.5	9.28	517.1
F 8	392.7	882.5	411	911.3	292.3	1102	74.51	815.5	52.63	475.3	59.26	429.1
F 9	266.6	830.6	373	896.7	263.8	825.6	72.23	582.4	42.63	311.8	52.42	372.2
F 10	315.5	829.5	398	953.8	305.4	1103	70.28	642.5	52.77	376.5	58.45	597.3
F 11	356.9	1044	383	1108	261.3	732.9	49.48	618.5	46.28	256.8	54.58	234.7
F 12	715.9	1159	696	1169	356.5	1113	108.9	892.2	72.72	662.4	76.31	609.3

* unit in µg/m³

Note : Fugitive emission standards as per MoEF Notification No. GSR 809(E), dtd.4.10.2010 on iron ore mining and processing. Particulate matter (PM)-1200 µg/m³ at a distance of 25±2m. In the pre dominant downward direction from the source of generation.

NB :

Locations :

A 1 : Tensa Hospital, Tensa	F1 : Ore Handling plant(BIM)	F5 : Stock pile & Loading(B.V. BIM)	F9: Drilling Area (KIM)
A 2 : Barsua valley, Township	F2 :Excavation & loading (BIM)	F6 : Haul Road (TMD)	F10: Excavation (KIM)
A 3 : Tamara Village	F3 : Haul Road(BIM)	F7 : Mobile Screening Area (TMD)	F11: Haul Road Area (KIM)
A 4 : Mge Site Office (KIM)	F4 : Dump Area(BIM)	F8 : Excavation Area (TMD)	F12: Mobile Crushing & Screening Area (KIM)



BARSUA-TALDIH-KALTA IRON MINES

DETAIL ANALYSIS OF AIR QUALITY MONITORING

Location	OCTOBER 2022					NOVEMBER 2022					DECEMBER 2022					JANUARY 2023					FEBRUARY 2023					MARCH 2023				
	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO	RSPM (PM ₁₀)	PM _{2.5}	SO ₂	NO _x	CO
Unit	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³

A) Ambient Air Quality in Residential, rural & other areas.

Norm as per NAAQS	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4	100	60	80	80	4
A 1	35.66	19.32	6.41	13.80	0.34	53.58	27.32	7.22	12.50	0.44	53.60	26.82	7.31	11.75	0.45	52.24	29.86	7.39	12.17	0.39	53.90	29.85	10.27	17.30	0.44	54.94	33.02	9.57	17.09	0.33
A 2	40.86	21.98	6.84	15.34	0.58	61.01	30.69	8.33	13.82	0.80	61.04	34.39	8.66	14.44	0.70	67.16	39.62	8.93	14.31	0.64	68.06	44.31	13.76	21.28	0.71	73.41	43.02	13.18	23.38	0.64
A 3	34.23	17.96	5.88	13.26	0.37	46.29	24.37	7.16	12.28	0.42	51.12	25.02	7.11	11.23	0.43	50.94	25.75	7.25	11.51	0.34	51.43	28.61	10.13	16.21	0.42	54.63	30.33	9.72	17.46	0.35
A 4	46.17	24.43	7.32	17.65	0.69	65.21	34.19	8.77	16.35	0.94	62.26	31.71	6.90	12.82	0.62	77.37	46.46	10.42	15.60	0.79	75.24	45.74	15.09	20.81	0.87	83.01	48.02	14.09	26.55	0.72

* unit in µg/m³

Note : Ambient Air Quality Monitoring was conducted as per MoEF Notification No. GSR 826(E), dtd.16.11.2009.

B) Results of Fugitive Emission / Work Zone Quality.

Norm as per IBM	OCTOBER 2022		NOVEMBER 2022		DECEMBER 2022		JANUARY 2023		FEBRUARY 2023		MARCH 2023	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Actual(PM)	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
F 1	70.21	421.4	298	622.2	532	693.5	527.9	732.4	592.12	751.8	546.8	815.7
F 2	74.68	425.7	383	542.5	410.7	882.2	542.1	808.6	619.98	785.1	590.4	811.9
F 3	58.21	231.4	250	408.2	308.4	468.6	321.4	562.9	437.97	618.6	387.9	591.7
F 4	63.23	431.7	293	617.1	512.4	682.9	546.6	742.4	592.69	729.5	619.4	811.7
F 5	64.51	443.9	316	596.7	527.2	727.5	549.1	789.3	617.15	723.8	617.2	785
F 6	54.2	305.6	248	427.8	319.2	535.6	308.9	508.6	419.27	619.1	417.6	540.6
F 7	84.42	742.6	733	908.8	819.4	961.8	746.6	943.5	782.29	945.2	808.1	941
F 8	72.43	639.7	687	805.1	788.7	897	696.5	869.2	702.45	832.4	696.5	846.2
F 9	51.21	435.7	409	791.3	618.4	785.3	549.7	723.4	569.85	732.3	608.5	754.6
F 10	88.21	611.7	614	801.3	718.2	896.7	68.42	746.9	619.82	792.3	643.5	996.9
F 11	62.56	321.4	246	442.3	317.3	509.7	354.9	515.2	417.49	592.7	396.5	544
F 12	108.7	779.3	732	913.3	779.8	953.9	743.6	936.4	796.52	954.6	784.6	937.4

* unit in µg/m³

Note : Fugitive emission standards as per MoEF Notification No. GSR 809(E), dtd.4.10.2010 on iron ore mining and processing. Particulate matter (PM)-1200 µg/m³ at a distance of 25=2m. In the pre dominant downward direction from the source of generation.

NB :

Locations :

- A 1 : Tensa Hospital, Tensa
- A 2 : Barsua valley, Township
- A 3 : Tantara Village
- A 4 : Mine Site Office (KIM)

- F 1 : Ore Handling plant(BIM)
- F 2 : Excavation & loading (BIM)
- F 3 : Haul Road(BIM)
- F 4 : Dump Area(BIM)

- F 5 : Stock pile & Loading(B.V. BIM)
- F 6 : Haul Road (TIM)
- F 7 : Mobile Screening Area (TIM)
- F 8 : Excavation Area(TIM)

- F 9 : Drilling Area (KIM)
- F 10 : Excavation (KIM)
- F 11 : Haul Road Area (KIM)
- F 12 : Mobile Crushing & Screening Area (KIM)

WATER QUALITY OF GROUND WATER

Sl.No.	Parameters	'APRIL 2022			MAY 2022			'JUNE 2022			'JULY 2022			'AUGUST 2022			'SEPTEMBER 2022		
		GW1	GW 2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3
1	pH	6.06	6.65	5.28	6.81	6.52	6.5	7	7	6.54	6.18	5.98	5.32	6.2	6.14	6.02	6.04	5.93	5.54
2	Colour(Hazen unit)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7	7	<1.0	<1.0	<1.0	<1.0	20	<1.0	<1.0	<1.0	<1.0	<1.0
3	Turbidity (NTU)	6.2	1.9	<1.0	3.8	6.3	2	6.5	7.5	2.1	5	8	9	13	<1.0	<1.0	1.1	1.3	1.2
4	Temperature °C	28.5°C	29°C	28.0°C	30.2°C	30.2°C	29.3°C	22°C	22°C	21°C	28.5°C	28.1°C	29.3°C	29.7°C	28.5°C	29.9°C	25°C	25°C	25°C
5	Total Hardness as CaCO ₃ ,mg/l	70	140	46	96	124	42	124	128	66	52	128	28	132	128	84	136	140	64
6	Alkalinity as CaCO ₃ ,mg/l	64	120	40	76	116	20	144	112	56	48	112	24	132	104	76	132	112	36
7	Chlorides as Cl ₂ , mg/l	6	12	14	6	12	10	8	8	8	4	15	8	4	16	16	2	14	16
8	Calcium as Ca, mg/l	16	36	11	21	35	10	27	50	11	10	34	6.4	27	34	21	27	35	14
9	Magnesium as Mg, mg/l	7.3	12.15	4.37	21	35	4	14	0.972	6.8	7	11	2.9	16	11	8	17	13	7
10	Residual Free Chlorine, mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
11	Sulphate as SO ₄ ,mg/l	<1.0	4	2	<1.0	4	6	<1.0	4	<1.0	2	5.8	3.6	<1.0	4	4	8	10	4
12	Nitrate as NO ₃ , mg/l	1.6	1.8	0.9	1.5	1.2	1.3	1.202	1.226	1.226	0.09	2.2	11.8	1.2	1.4	1.1	1.2	1	1.3
13	Iron as Fe,mg/l	0.328	0.115	0.202	0.08	0.165	0.229	0.713	0.446	2.079	1.04	0.554	0.74	0.286	<0.5	<0.05	0.205	0.116	0.22
14	Copper as Cu,mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
15	Manganese as Mn,mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.104	0.684	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
16	Phenolic Compounds C ₆ H ₅ OH, mg/l	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
17	Zinc as Zn, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.216	<0.01	0.052	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Cadmium as Cd, mg/l	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.003	<0.002	<0.003	<0.002	<0.002	<0.002
19	Arsenic as As, mg/l	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Cyanide as CN, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead as pb	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Total Chromium as Cr ⁺⁺ , mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Mineral oil ,mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
24	Fluoride as F, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.286	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	<0.1
25	Selenium as Se, mg/l	<0.01	<0.01	<0.01	<0.2	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Total Dissolved solids (mg/l)	65	147	68	81	143	58	142	150	174	42	126	35	136	159	112	141	150	81
27	Aluminium as Al mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
28	Boron as B mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
29	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
30	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
31	Mercury as Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Anionic detergent	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

NB :

GW 1 : Hand pump at Zero point : (BIM)

GW 2 : Hand pump at Banka Bazar B/Valley

GW 3 : Hand Pump at Kalta Village (KIM)

WATER QUALITY OF GROUND WATER

Sl.No.	Parameters v	'OCTOBER 2022			NOVEMBER 2022			'DECEMBER 2022			JANUARY 2023			'FEBRUARY 2023			'MARCH 2023		
		GW1	GW 2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3	GW1	GW2	GW3
1	pH	6.34	6.12	5.74	6.65	6.2	6.65	5.93	5.81	6.05	6.7	6.2	5.92	7	7	7	6.18	5.95	5.95
2	Colour(Hazen unit)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7	24	<1.0
3	Turbidity (NTU)	5	4	<1.0	1.7	6.9	1.6	5.2	6.3	1.3	3.2	9.7	1.1	3.4	1.4	<1.2	2.9	3.2	<1.0
4	Temperature °C	28.2°C	28.2°C	28.5°C	28°C	28.1°C	28.2°C	20°C	21°C	21°C	27.6°C	27.6°C	27.5°C	23°C	23°C	22°C	29°C	28.6°C	28.9°C
5	Total Hardness as CaCO ₃ ,mg/l	92	148	76	140	140	48	96	140	88	148	136	56	68	168	84	92	148	88
6	Alkalinity as CaCO ₃ ,mg/l	80	116	60	140	124	32	96	116	80	156	116	44	80	168	80	92	128	92
7	Chlorides as Cl ₂ , mg/l	4	8	4	2	4	4	5	20	4	8	12	4	4	4	4	4	12	8
8	Calcium as Ca, mg/l	37	40	17.6	25.6	43	12.8	24	35	24	32	37	11	19	48	18	19	35	18
9	Magnesium as Mg, mg/l	<0.243	12	7.8	18.5	7.7	3.9	9	13	7	77	11	7	5	12	10	11	15	11
10	Residual Free Chlorine, mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
11	Sulphate as SO ₄ ,mg/l	<1.0	5	2	5	9	5	<1.0	11	<1.0	3	6	5	<1.0	6	2	<1.0	4.8	1.8
12	Nitrate as NO ₃ , mg/l	8.613	7.09	2.12	1.8	1.6	1.4	1.2	1.8	2.2	0.125	0.092	0.025	1.6	1.2	1	2.9	2.7	3
13	Iron as Fe,mg/l	0.269	0.228	0.167	0.262	0.108	0.098	0.38	0.13	0.066	0.35	0.621	0.66	0.239	0.05	0.08	0.482	0.409	0.281
14	Copper as Cu,mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
15	Manganese as Mn,mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.05	0.07	0.788	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
16	Phenolic Compounds C ₆ H ₅ OH, mg/l	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001
17	Zinc as Zn, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.116	0.14	0.108	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	Cadmium as Cd, mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
19	Arsenic as As, mg/l	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01
20	Cyanide as CN, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead as pb	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Total Chromium as Cr ⁶⁺ , mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Mineral oil ,mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
24	Fluoride as F, mg/l	0.247	0.269	0.089	<0.5	<0.5	<0.1	0.241	<0.1	0.042	<0.01	<0.01	0.06	<0.5	<0.5	0.088	<0.1	0.168	<0.1
25	Selenium as Se, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.5
26	Total Dissolved solids (mg/l)	86	155	77	132	156	68	86	147	80	141	155	80	71	156	88	90	144	88
27	Aluminium as Al mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
28	Boron as B mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1	<0.01	<0.01	<1.0
29	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
30	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
31	Mercury as Hg, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Anionic detergent	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.01	<0.01	<1.0

NB :

GW 1 : Hand pump at Zero point : (BIM)

GW 2 : Hand pump at Banka Bazar B/Valley

GW 3 : Hand Pump at Kalta Village (KIM)



BARSUA-TALDIH-KALTA IRON MINE

WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No.	Parameters	'APRIL 2022						'MAY 2022						JUNE 2022					
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6
1	pH	5.94	5.81	5.80	5.78	5.71	5.8	6.33	6.24	4.29	5.7	6.08	6.19	6.7	6.8	6.25	6.41	6.38	6.48
2	Temperature	29.3°C	29.2°C	28.0°C	28.0°C	28.2°C	28.5°C	23°C	23°C	24°C	24°C	23°C	23°C	21°C	21°C	22°C	22°C	24°C	23°C
3	Turbidity(NTU)	<1.0	<1.0	1.4	1.1	2.7	2.6	2.6	2.5	1.7	2.2	3.8	3.7	1.6	1.3	3.6	1.9	<1.0	9.1
4	Residual Free Chlorine mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	Alkalinity as CaCo3 mg/l	16	22	32	26	40	34	20	24	14	26	34	40	20	20	36	28	20	48
6	Chloride as Cl mg/l	2	4	4	4	4	6	4	2	8	8	2	2	8	8	8	8	N.T	N.T
7	Total Hardness as CaCo3 mg/l	18	24	30	20	36	40	20	26	18	20	26	44	24	20	24	24	24	52
8	Calcium as Ca mg/l	3.2	4.8	8	6.4	8	8.8	5	6	5	6	9	10	5	5	6	10.06	10	11
9	Magnesium as Mg mg/l	2.4	2.9	2.4	0.9	3.8	4.3	2	2	2	1	3	4	2.9	1.9	1.9	<0.243	<0.243	5.8
10	Sulphate as So4 mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	2	2	<1.0	<1.0	2	3
11	Nitrate as No3 mg/l	2.8	2.6	2.5	3.9	4.2	3.3	4.6	4.8	3.9	3.7	5.2	5	2.6	2.9	3.4	3.5	1.9	1.6
12	Fluoride as F mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Total dissolve Solids mg/l	40	25	40	32	44	41	20	18	18	27	39	35	25	32	49	39	27	64
14	Total Suspended Solids mg/l	8	6	4	5	6	7	8	12	6	10	10	12	3	3	3	4	2	2
15	D.O.	4.5	4.6	4.8	4.5	4.3	4.4	4.4	4.3	4.2	4	4	4.2	4.2	4	4.4	3.9	4	3.8
16	COD	5	6	4	6	7	10	4	6	6	5	7	5	4	8	7	5	4	4
17	Oil and Grease mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron as Fe mg/l	0.896	0.762	0.553	0.705	0.623	0.523	0.55	0.52	0.464	0.398	0.443	0.402	<0.05	<0.05	1.433	0.216	<0.05	<0.05
19	Copper as Cu mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
20	Zinc as Zn mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Aluminium as Al mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
22	Boron as B mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
23	Manganese as Mn mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
24	Lead as Pb mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Cadmium as Cd mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Arsenic as As mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.585
27	Mercury as Hg mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel as Ni mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Chromium as Cr +6mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
30	Phenolic compound mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
31	Cyanide as CN mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
32	Sulphide as S mg/l	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T
33	Free Ammonia as N mg/l	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T
34	Kjeldahl Nitrogen as N mg/l	4	2	5	3.8	4.2	4.5	-	4	6	5	3	4	3	6	4	5	5	3
35	Ammonia as N mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

NB :

SW 1: Kuradih Nala US : BIM

SW 2: Kuradih Nala DS : BIM

SW 3: Samaj Nallah US : Near Tantra

SW 4: Samaj Nallah DS : Near Phuljhar

SW 5: Samaj Nallah US : KIM

SW 6: Samaj Nallah DS : KIM

BARSUA-TALDIH-KALTA IRON MINE

WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No.	Parameters	JULY 2022						AUGUST 2022						SEPTEMBER 2022					
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6
1	pH	6.88	6.44	5.69	5.9	5.99	6.21	5.55	5.77	5.29	5.49	5.67	5.67	6.27	6.25	5.88	5.86	5.96	6.18
2	Temperature	28.9°C	28.7°C	29.1°C	30.0°C	31.2°C	31.2°C	30.3°C	30.3°C	30.4°C	25.8°C	30.3°C	25.9°C	21°C	22°C	21°C	21°C	20°C	21°C
3	Turbidity(NTU)	2	6	5	27	<1.0	38	8	15	1	11	1	8	1.8	1.6	6.9	30	2.6	5.2
4	Residual Free Chlorine mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	Alkalinity as CaCO ₃ mg/l	20	20	40	32	20	32	16	28	24	28	12	24	16	24	22	24	20	20
6	Chloride as Cl mg/l	2	2	2	2	2	2	4	4	4	4	4	4	2	2	4	10	8	2
7	Total Hardness as CaCO ₃ mg/l	32	24	32	32	24	40	16	32	24	28	24	24	32	36	40	36	48	40
8	Calcium as Ca mg/l	3.2	8	9.6	11.2	4.8	8	4.8	8	5.6	5.6	5.6	6.4	6.4	8	6.4	8	8	16
9	Magnesium as Mg mg/l	5.8	0.972	1.9	0.972	2.9	4.86	0.972	2.9	2.4	3.4	2.4	1.9	3.8	3.8	5.8	3.8	6.8	<0.243
10	Sulphate as SO ₄ mg/l	4	2	<1.0	<1.0	3	5	<1.0	2	<1.0	2	4	<1.0	4	3	5	2	4	4
11	Nitrate as NO ₃ mg/l	4.6	2.7	3.9	4.5	6.2	2.8	4.8	4.5	4.6	5	3.2	3.9	3.5	3.4	2.5	2.8	4.2	4
12	Fluoride as F mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Total Dissolve Solids mg/l	20	21	44	37	17	34	23.8	31.38	24.72	29.52	24.64	29.39	33	34	39	33	35	38
14	Total Suspended Solids mg/l	4	6	10	20	4	18	5	6	3	2	8	6	10	8	18	38	12	14
15	D.O.	3.9	4	3.8	4.1	4	3.8	4	4	4	4.2	4.2	4.1	4.2	3.9	4	4	4	3.9
16	COD	162	140	325	127	109	86	6	7	8	6	8	6	3	6	4	3	5	5
17	Oil and Grease mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron as Fe mg/l	0.057	0.082	0.545	0.672	0.02	1.324	0.172	0.403	<0.05	0.204	<0.05	0.404	0.246	0.369	0.308	0.912	0.425	0.398
19	Copper as Cu mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
20	Zinc as Zn mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Aluminium as Al mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
22	Boron as B mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
23	Manganese as Mn mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
24	Lead as Pb mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Cadmium as Cd mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
26	Arsenic as As mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
27	Mercury as Hg mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel as Ni mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Chromium as Cr +6mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
30	Phenolic compound mg/l	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
31	Cyanide as CN mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
32	Sulphide as S mg/l	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T
33	Free Ammonia as N mg/l	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T
34	Kjeldahl Nitrogen as N mg/l	2	4	3	3	2	5	4	6	3	3	3	4	4	6	5	6	4	4
35	Ammonia as N mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

NB :

- SW 1: Kuradih Nala US : BIM
- SW 2: Kuradih Nala DS : BIM
- SW 3: Samaj Nallah US : Near Tantra
- SW 4: Samaj Nallah DS : Near Phuljhar
- SW 5: Samaj Nallah US : KIM
- SW 6: Samaj Nallah DS : KIM

N.T: Not Traceable



BARSUA-TALDIH-KALTA IRON MINE

WATER QUALITY OF STREAM SAMPLES/SURFACE WATER

Sl.No.	Parameters	'OCTOBER 2022						'NOVEMBER 2022						DECEMBER 2022					
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6
1	pH	6.5	6.47	6.4	6.41	6.15	6.4	6.33	6.4	6.61	6.72	6.24	6.22	6.58	6.39	6.66	6.18	6.03	6.26
2	Temperature	28.0°C	28.3°C	28.5°C	28.4°C	27.9°C	28.6°C	28.5°C	28.7°C	28.8°C	28.6°C	28.6°C	28.7°C	20°C	20°C	21°C	21°C	20°C	21°C
3	Turbidity(NTU)	2	<1.0	4	1	<1.0	9.1	1.1	2.2	1.5	1.4	1.5	1.4	<1.0	2.3	1.7	<1.0	1.7	<1.0
4	Residual Free Chlorine mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	Alkalinity as CaCo3 mg/l	20	20	20	32	24	20	16	20	24	20	20	36	12	24	12	24	44	20
6	Chloride as Cl mg/l	4	4	4	4	4	4	6	6	6	2	2	2	4	4	4	4	8	4
7	Total Hardness as CaCo3 mg/l	28	40	36	40	28	28	20	16	24	24	32	44	20	24	20	36	52	36
8	Calcium as Ca mg/l	8	6.4	6.4	11	5	3.2	8	6.4	6.4	4.8	6.4	6.4	6	3	3	6	11	5
9	Magnesium as Mg mg/l	2	6	5	3	4	5	<0.243	<0.243	1.9	1.9	4.8	6.8	0.972	4	3	5	6	5
10	Sulphate as So4 mg/l	3	3	4	3	2	4	2	<1.0	<1.0	1	4	6	8	<1.0	8	10	15	12
11	Nitrate as No3 mg/l	2.25	3.2	1.96	2.88	3.56	4.28	0.835	2.202	0.964	2.162	3.226	2.068	4.6	4.8	3.9	4.4	3.5	5.6
12	Fluoride as F mg/l	<0.1	<0.1	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13	Total dissolve Solids mg/l	27	22	23	40	34	29	40	25	34	32	29	34	29	22	20	27	45	23
14	Total Suspended Solids mg/l	18	20	18	20	22	16	7	8	6	5	6	4	25	30	22	18	16	14
15	D.O.	4.2	4	4.2	4	3.9	3.9	4.2	4.3	4	4.2	4.4	4.1	3.9	3.8	3.9	3.9	3.8	3.9
16	COD	47	56	54	62	48	55	60	80	102	142	80	102	40	62	80	95	45	58
17	Oil and Grease mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron as Fe mg/l	0.269	0.36	0.562	0.329	0.305	0.88	0.336	0.269	0.562	0.662	0.872	0.605	<0.05	<0.05	<0.05	<0.05	0.096	<0.05
19	Copper as Cu mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
20	Zinc as Zn mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Aluminium as Al mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
22	Boron as B mg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
23	Manganese as Mn mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
24	Lead as Pb mg/l	<0.1	<0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25	Cadmium as Cd mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Arsenic as As mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.585	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Mercury as Hg mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
28	Nickel as Ni mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Chromium as Cr +6mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
30	Phenolic compound mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.00	<0.002	<0.002
31	Cyanide as CN mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
32	Sulphide as S mg/l	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T
33	Free Ammonia as N mg/l	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T	N.T
34	Kjeldahl Nitrogen as N mg/l	13	14	13	13	14	15	4	5	3	4	2	5	15	18	20	22	18	20
35	Ammonia as N mg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	N.T	N.T	N.T	N.T	N.T	N.T

NB :

SW 1: Kuradh Nala US : BIM

SW 2: Kuradh Nala DS : BIM

SW 3: Samaj Nallah US : Near Tantra

SW 4: Samaj Nallah DS : Near Phuljhar

SW 5: Samaj Nallah US : KIM

SW 6: Samaj Nallah DS : KIM

N.T: Not Test