

Environmental Status Report
For
Tatijharia Bauxite Mine
at
Post & Teh.: Samri, (Kusmi)
Dist: Balrampur-Ramanujganj(C.G.)

Duration: January-February-March-2021

Name of Industry:-



M/s. Hindalco Industries Limited.,

Name of Laboratory:-



QCI-NABET, MoEF & CC (GOI)
ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
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Agent of Mines
Samri Mines Division
Hindalco Industries Ltd



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1.1 Introduction

Hindalco Industries Limited (Hindalco) is one among the flag ship companies of the Aditya Birla Group of Industries and is one of the largest corporate groups in India. This group is a leading manufacturer of Aluminum in India, having integrated facilities encompassing bauxite, mining, refining and smelting to achieve Aluminum.

Various processing units of Hindalco are strategically located in different parts of the nation to achieve optimum benefits. Over the past few decades the group has grown multifold in its production capacities, product mix and diversification in mining. The Chhattisgarh Environment Conservation Board (CECB) granted permission for establishing the Bauxite mine to Hindalco at block Tatijharia, Kudag and Samri mines in Balrampur District of Chhattisgarh State.

HINDALCO INDUSTRIES LTD. awarded the work to M/s ANACON LABORATORIES PVT. LTD. NAGPUR (ALPL) for carrying out monitoring of parameters for assessing pollution levels and preparation of monthly report (January-February-March-2021) as per the requirement of Chhattisgarh Environment Conservation Board (CECB) and Ministry of Environment Forest and climate change (MoEF & CC) for Tatijharia mining lease in Balrampur District, Chhattisgarh State.

1.2 Background Information of Tatijharia Mine

Hindalco was granted Tatijharia Bauxite mining lease over an area of 1218.762hec.inTatijharia, Post Jamira, Tehsil Samri of Balrampur district, Chhattisgarh on 25/06/1998 for a period of 20 years. As per the Mines and Mineral (Development and Regulation) Amendment Act, 2015, Tatijharia lease has been extended up to 30 years i.e 24/06/2048. The mining operations were started on 01/04/2004. The production capacity of Tatijharia bauxite mine is 4.0 Lakh Tone/Year.



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1.5 Air Environment

1.5.1 'Ambient Air Quality Monitoring'

Ambient Air Quality monitored at 8 locations in the core zone and buffer zone with reference to Tatijharia mine lease area shown in **(Fig. 1)**.

Table 2

Locations of Ambient Air Quality Monitoring (AAQM)
(1218.762 hec.)

Sl. No.	(Core Zone)	Sl. No.	Buffer Zone
1	Piprapat/Nr.Mining Area	5	Kutku Village/Nr.V.T.Center
2	Betpani	6	Sairaidh Campus
3	Virhorepat	7	Rajendrapur/Nr.Mining Area
4	Tatijharia Village/Nr.Weigh Bridge	8	Dumerkholi/Nr.Mining Area

The sampling stations are selected at the above mentioned locations, in downwind and upwind directions of the mining site in the core zone and buffer zone. ALPL is carrying out regular monitoring for PM₁₀, PM_{2.5}, SO₂, NO_x and Pb, Hg, As and Cr above Ambient Air Quality Monitoring (AAQM) locations. The dust fall rate was measured in the mining area (BKB campus) and Tatijharia village during January-2021 to March-2021. The AAQM sampling sites are selected considering seasonal variation in wind speed and wind direction.

1.5.2 Sampling Duration and Frequency

Ambient air quality monitoring was carried out for the parameters PM₁₀, PM_{2.5}, SO₂, NO₂ and Pb, Hg, As and Cr from January-2021 to March-2021 as per CPCB norms.

Data is compared with the present revised standards mentioned in the latest Gazette Notification of the Central Pollution Control Board (CPCB) (November-18, 2009), and as per consent conditions mentioned in consent letter.



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Table 4.0

Measurement Techniques for various pollutants

Sr. No.	Parameter	Technique	Technical Protocol	Minimum Reportable Value($\mu\text{g}/\text{m}^3$)
1.	Suspended Particulate Matter	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part - 23)	5
2.	Respirable Particulate Matter	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part-23)	5
3.	Particulate Matter 2.5	Respirable Dust Sampler (Gravimetric Method)	USEPA-40 (Part-50)	5
4.	Sulphur Dioxide	Modified West and Gaeke	IS-5182 (Part - II)	4
5.	Oxide of Nitrogen	Jacob &Hochheiser Method	IS-5182 (Part - VI)	4
6.	Pb, As, Hg, Cr	Acid Digestion Method	EPA Method	0.1
7.	Dust Full	Gravimetric	IS-5182 (Part-I)	—

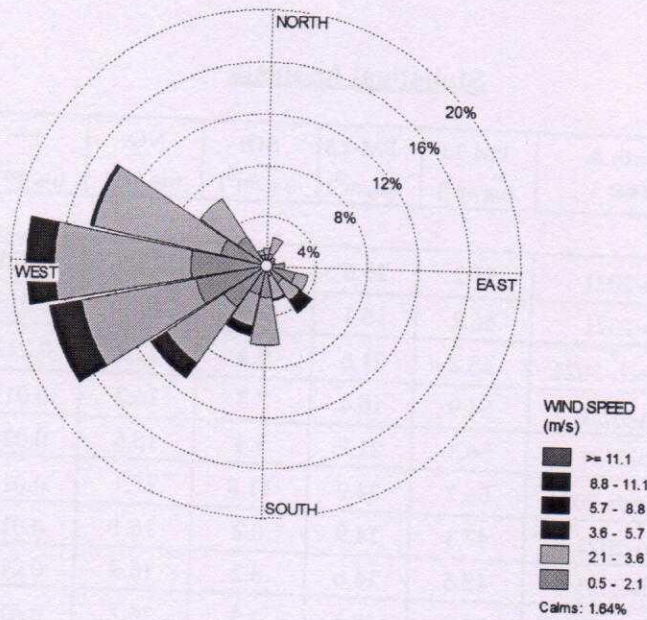


Figure.01: Wind Rose Diagram (January-February-March-2021)

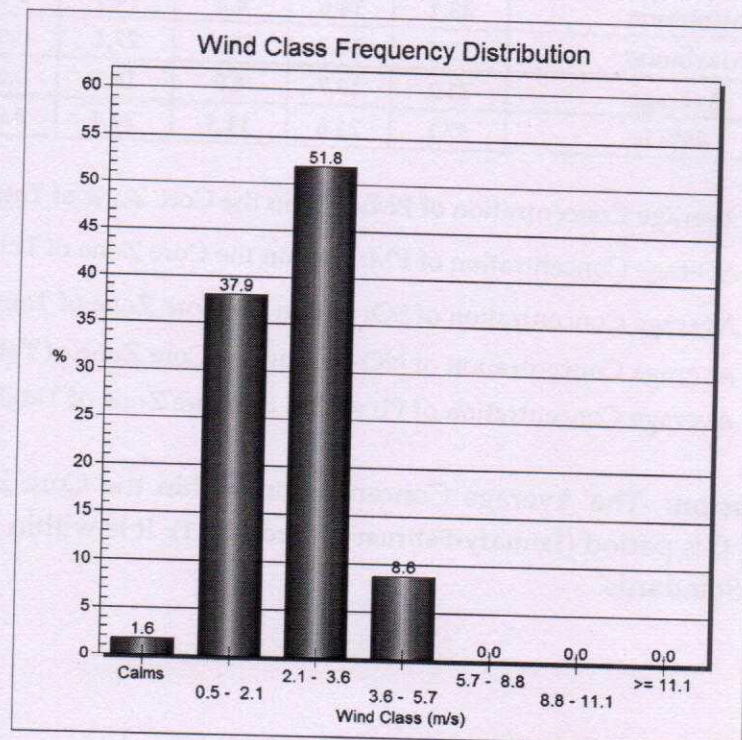


Figure.02: Wind Class Frequency Distribution (January-February-March-2021).



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Location	Month & Year	PM-10 ($\mu\text{g}/\text{m}^3$)	PM-2.5 ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	Pb ($\mu\text{g}/\text{m}^3$)	Hg ($\mu\text{g}/\text{m}^3$)	As (ng/m^3)	Cr ($\mu\text{g}/\text{m}^3$)
Buffer Zone									
Kutku Village /Nr.V.T.Center	Jan-2021	48.3	17.1	6.8	17.3	ND	ND	ND	ND
	Feb-2021	43.8	14.7	6.4	16.2	ND	ND	ND	ND
	March-2021	57.1	18.7	9.3	18.2	0.014	ND	ND	ND
Sairaidh Campus	Jan-2021	53.8	16.4	7.3	18.1	ND	ND	ND	ND
	Feb-2021	48.3	17.2	9.4	18.6	ND	ND	ND	ND
	March-2021	54.9	21.6	9.7	17.4	ND	ND	ND	ND
Rajendrapur/ Nr.Mining Area	Jan-2021	57.1	21.6	9.3	21.7	0.018	ND	ND	ND
	Feb-2021	47.6	18.2	7.6	16.4	0.016	ND	ND	ND
	March-2021	63.9	21.8	12.6	24.9	0.019	ND	ND	ND
Dumerkholi/ Nr.Mining Area	Jan-2021	51.7	16.8	6.4	16.9	0.012	ND	ND	ND
	Feb-2021	51.9	17.3	8.2	17.6	0.008	ND	ND	ND
	March-2021	58.3	24.1	11.1	23.6	0.016	ND	ND	ND
CPCB Standards		100 (24 hrs)	60 (24 hrs)	80 (24 hrs)	80 (24 hrs)	1.0 (24 hrs)	---	6.0 (annual)	---
Minimum		43.8	14.7	6.4	16.2	0.000	---	---	---
Maximum		63.9	24.1	12.6	24.9	0.019	---	---	---
Average		53.1	18.8	8.7	18.9	0.009	---	---	---
98% le		62.7	23.6	12.3	24.6	0.019	---	---	---

- The Average Concentration of PM₁₀ within the Buffer Zone of Tatijharia Lease is 53.1 $\mu\text{g}/\text{m}^3$.
- The Average Concentration of PM_{2.5} within the Buffer Zone of Tatijharia Lease is 18.8 $\mu\text{g}/\text{m}^3$.
- The Average Concentration of SO₂ within the Buffer Zone of Tatijharia Lease is 8.7 $\mu\text{g}/\text{m}^3$.
- The Average Concentration of NO_x within the Buffer Zone of Tatijharia Lease is 18.9 $\mu\text{g}/\text{m}^3$.
- The Average Concentration of Pb within the Buffer Zone of Tatijharia Lease is 0.009 $\mu\text{g}/\text{m}^3$.

Conclusion: -The Average Concentration within the Buffer Zone of Tatijharia Lease during this period (January-February-March-2021). It is within permissible limits as per CPCB Standards.



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E. Lead (Pb):

Maximum Lead detected in PM₁₀ samples was 0.021 µg/m³ at Tatijharia Village/ Nr. Weigh Bridge and also at Piprapat/Nr. Mining area and the minimum lead in PM₁₀ sample was 0.012 µg/m³ detected at Betpani location. No lead could be detected in PM_{2.5} samples at any of the Ambient Air samples at any of the locations.

F. Mercury(Hg):

Mercury was not detected at any of the locations in PM₁₀ samples as well as PM_{2.5} Samples.

G. Arsenic (As):

Arsenic was not detected at any of the locations in PM₁₀ samples as well as PM_{2.5} Samples.

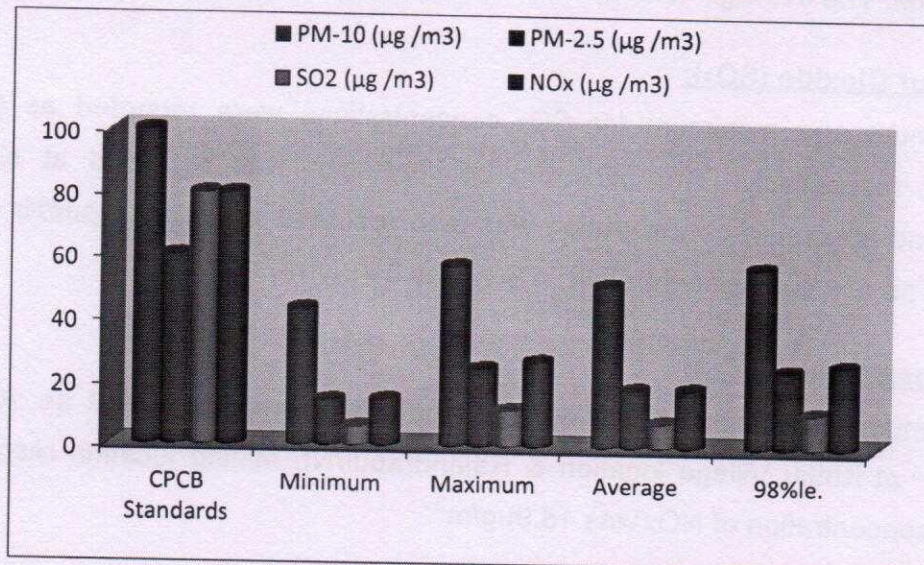
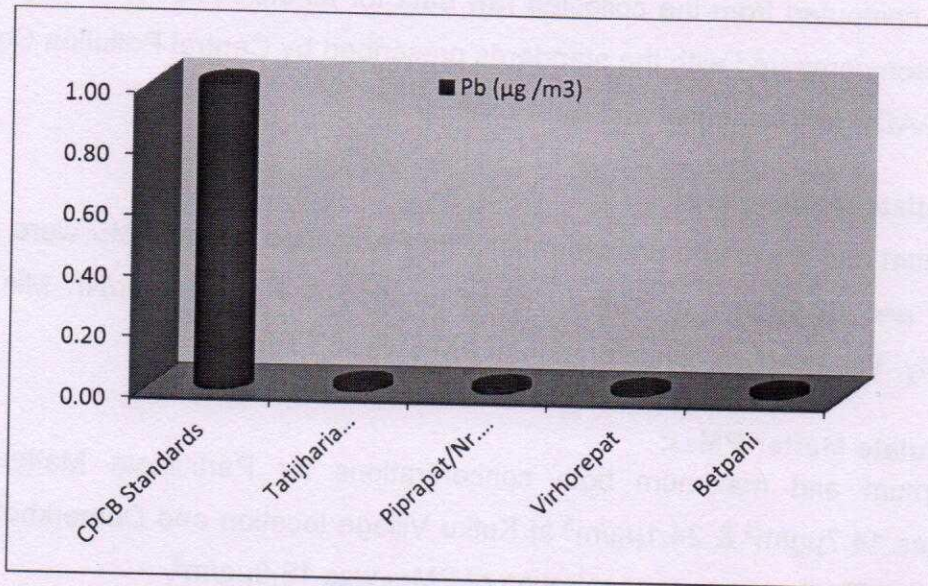
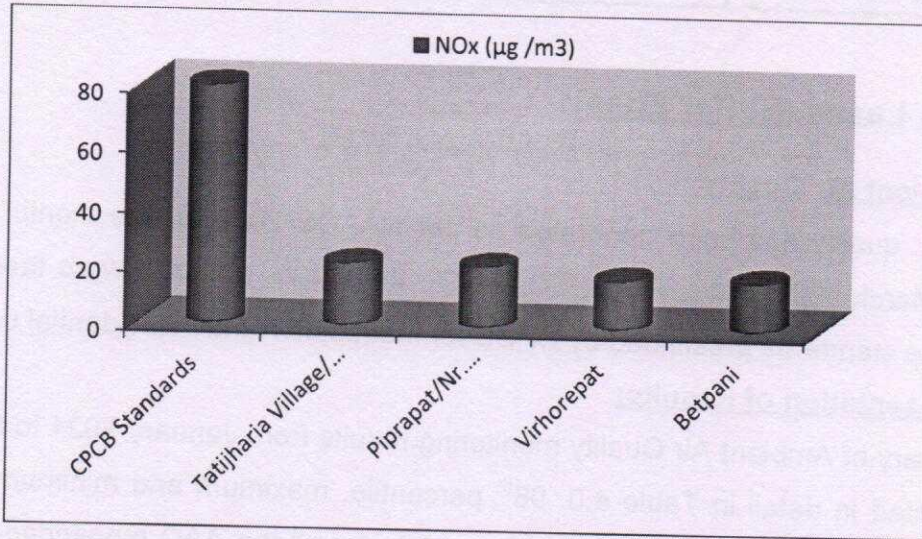
H. Chromium(Cr):

Chromium was not detected at any of the locations in PM₁₀ samples as well as PM_{2.5} Samples.



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E. Lead (Pb):

Maximum Lead detected in PM₁₀ samples was 0.019µg/m³ at Rajendrapur/Nr. Mining location and the minimum lead in PM₁₀ sample was not detected at Kutku village and Sairaidh Campus location.

No lead could be detected in PM_{2.5} samples at any of the Ambient Air samples at any of the locations.

F. Mercury (Hg):

Mercury was not detected at any of the locations in PM₁₀ samples as well as PM_{2.5} Samples.

G. Arsenic (As):

Arsenic was not detected at any of the locations in PM₁₀ samples as well as PM_{2.5} Samples.

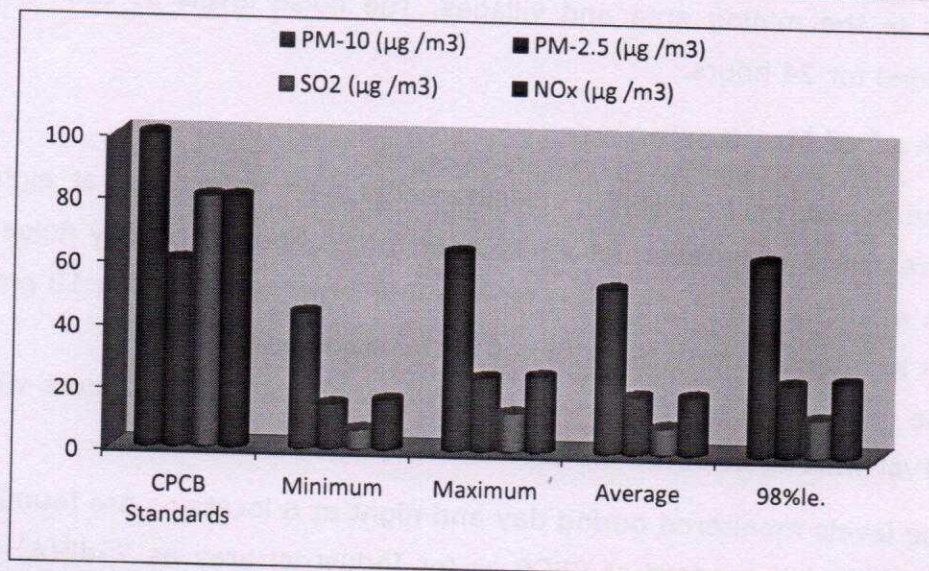
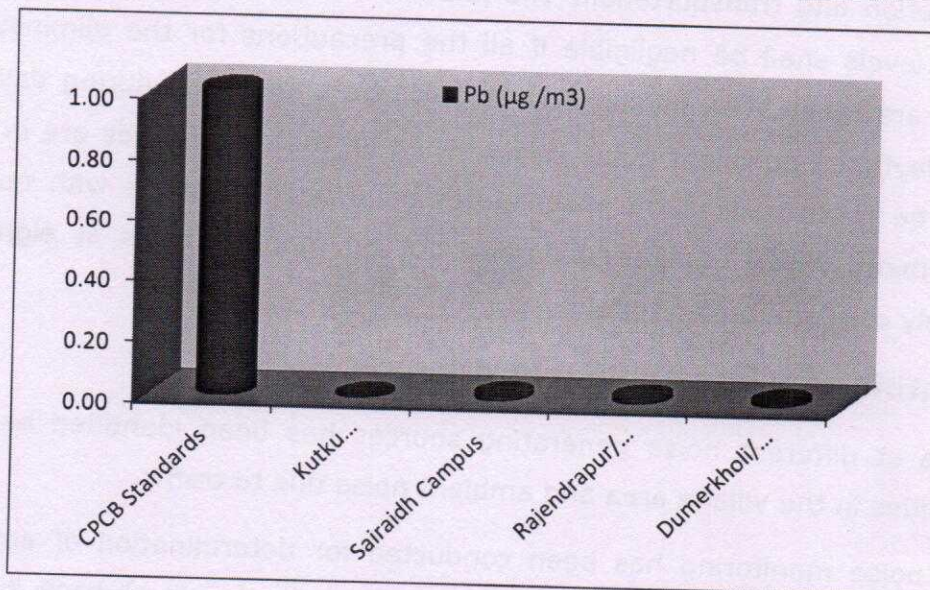
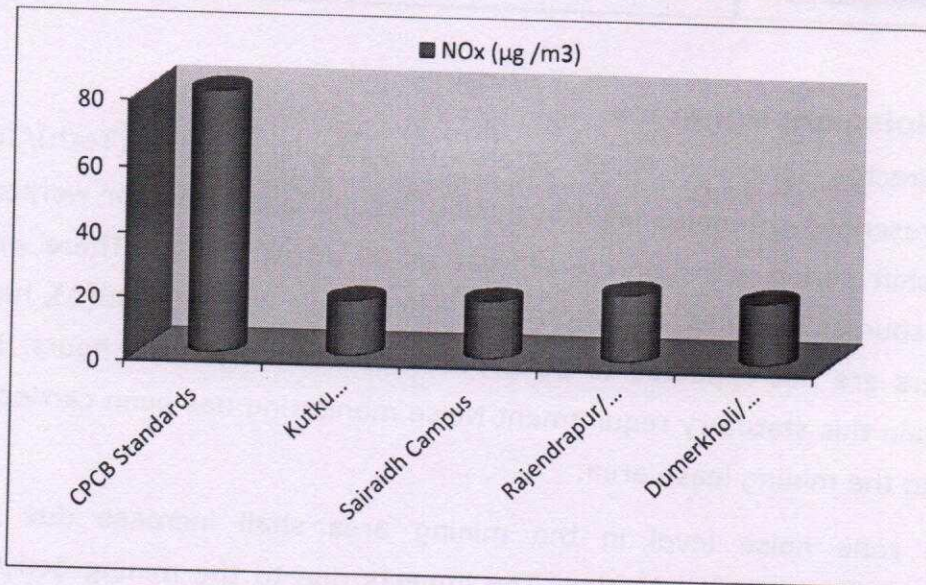
H. Chromium (Cr):

Chromium was not detected at any of the locations in PM₁₀ samples as well as PM_{2.5} Samples.



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Instrument used for monitoring

Noise levels were measured using integrated sound level meter Model no. HTC-SL-1352. This instrument is capable of measuring the Sound Pressure Level (SPL), Leq.

Table 7

Noise Emission Monitoring Report

SR. NO.	LOCATION	Month	Noise-dB(A)	
			Day Time	Night Time
Core Zone				
1	Tatijharia Village/Nr.Weigh Bridge	January-2021	53.8	41.6
		February-2021	62.9	53.1
		March-2021	46.9	38.2
2	Piprapat/Nr. Mining Area	January-2021	61.9	56.2
		February-2021	57.1	43.6
		March-2021	53.7	41.6
Buffer Zone				
1	Samri-Gopatu/ Near Weigh bridge	January-2021	53.9	43.7
		February-2021	48.3	37.1
		March-2021	54.7	43.6
2	Rajendrapur/Nr.Mining Area	January-2021	47.1	37.2
		February-2021	51.6	41.9
		March-2021	46.1	38.3
CPCB Standards				
Industrial Area			75	70
Residential area			55	45

Conclusion: -The Noise Monitoring Results at Tatijharia Lease during this period (January-February-March2021), it is within permissible limits as per CPCB Standards.

Table 8

HEMM Spot Noise Level Monitoring

Sl. No.	Location	Unit: dB(A)					
		Jan-2021		Feb-2021		March-2021	
		Min.	Max.	Min.	Max.	Min.	Max.
1.	Piprapat/Nr.Mining Area	54.7	59.3	51.6	61.4	56.3	64.9
2.	Tatijharia Village/ Nr.Weigh Bridge	48.2	54.7	49.3	58.2	53.1	58.2



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2.0 Water Quality

The existing status of water quality for ground water and surface water was assessed by collecting the water samples from underground wells from the piprapat/Nr.mining area.

The purpose of the study is to assess the water quality characteristics for critical parameters, evaluate the impacts on agricultural productivity, habitat conditions, recreational resources and aesthetics in the vicinity and identification of impact on water quality by this project and related activities.

The physico-chemical analysis of water samples collected during the study period is given in **(Table-10 and Fig.5)**. The overall water quality found to be below the stipulated standards of IS 10500-2012 for ground water & found to be fit for drinking purpose for tested parameters. Thus the impacts due to mining activities have been found to be insignificant.

The drinking water is supplied by the tankers from for-away sources. Hence, additional care now be taken to chlorinate the tankers before leaving the supply source.



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S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
II	Chemical Testing 2. Residues In Water					
41	Polychlorinated biphenyls					
	2,2',5-trichlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
	2,4,4'-trichlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
	2,2',5,5'-tetrachlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
	2,2',4,5,5'-pentachlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
	2,2',3,4,4',5'-hexachlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
	2,2',4,4',5,5'-hexachlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
	2,2',3,4,4',5,5'-heptachlorobiphenyl	µg/l	ANqr RES - 31	0.5	No relaxation	BDL (DL - 0.03)
42	Polynuclear aromatic hydrocarbons					
	Naphthalene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Acenaphthylene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Acenaphthene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Fluorene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Anthracene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Phenanthrene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Fluoranthene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Pyrene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Benzo(a)anthracene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Chrysene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Benzo(a)pyrene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Benzo(b)fluoranthene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Benzo(k)fluoranthene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Indeno(123,cd)pyrene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Dibenzo(a,h)anthracene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
	Benzo(ghi)perylene	µg/l	ANqr RES - 30	0.1	No relaxation	BDL (DL - 0.03)
43	Trihalomethanes					
i	Bromoform	mg/l	APHA 6232 23 rd Edition	0.1	No relaxation	BDL (DL - 0.05)
ii	Dibromochloromethane	mg/l		0.1	No relaxation	BDL (DL - 0.05)
iii	Bromodichloromethane	mg/l		0.06	No relaxation	BDL (DL - 0.05)
iv	Chloroform	mg/l		0.2	No relaxation	BDL (DL - 0.05)
44	Pesticide Residues Organochlorine					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL (DL - 0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL (DL - 0.03)
iii	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL (DL - 0.03)
iv	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL (DL - 0.03)
v	Alachlor	µg/l	ANqr RES-29	20	No relaxation	BDL (DL - 0.03)
vi	Aldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL (DL - 0.03)
vii	Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL (DL - 0.03)
viii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL (DL - 0.03)
ix	p,p'-DDE	µg/l	ANqr RES-28	1	No relaxation	BDL (DL - 0.03)
x	o,p'-DDE	µg/l	ANqr RES-28	1	No relaxation	BDL (DL - 0.03)
xi	p,p'-DDD	µg/l	ANqr RES-28	1	No relaxation	BDL (DL - 0.03)
xii	o,p'-DDD	µg/l	ANqr RES-28	1	No relaxation	BDL (DL - 0.03)
xiii	o,p'- DDT	µg/l	ANqr RES-28	1	No relaxation	BDL (DL - 0.03)
xiv	p,p'- DDT	µg/l	ANqr RES-28	1	No relaxation	BDL (DL - 0.03)
xv	Endosulphan					
	Alpha-Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL (DL - 0.03)
	Beta-Endosulphan					
	Endosulphan sulphate					

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REMARKS: As requested by the client, sample was tested for above parameters only. **Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.**



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S.N.	Test Parameter	Measurement Unit	Test Method	Test Result
14	Exchangeable Sodium (as Na)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	116.52
15	Exchangeable Potassium (as K)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	18.27
16	Exchangeable Calcium (as Ca)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	206.42
17	Exchangeable Magnesium (as Mg)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	53.68
18	Sodium adsorption ratio	-	By Calculation	16.4
19	Total Organic matter	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	2.04
20	Total Organic Carbon	%	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.27
21	Available Nitrogen (as N)	Kg/hect	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	241.63
22	Available Phosphorous (as P)	Kg/hect	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	19.24
23	Available Potassium (as K)	Kg/hect	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	493.82
24	CEC	meq/100g	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	6
25	Arsenic (As)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
26	Boron (B)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.24
27	Cadmium (Cd)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
28	Chromium (Cr)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
29	Copper (Cu)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.62
30	Lead (Pb)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
31	Nickel (Ni)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent
32	Cobalt (Co)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	0.29
33	Iron (Fe)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	7.16
34	Manganese (Mn)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	16.48
35	Zinc (Zn)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	1.17
36	Selenium (Se)	mg/Kg	Method Manual, Soil testing in India (Department of agriculture & corporation, Govt of India)	Absent

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Remarks: As requested by the client, sample was tested for above parameters only.



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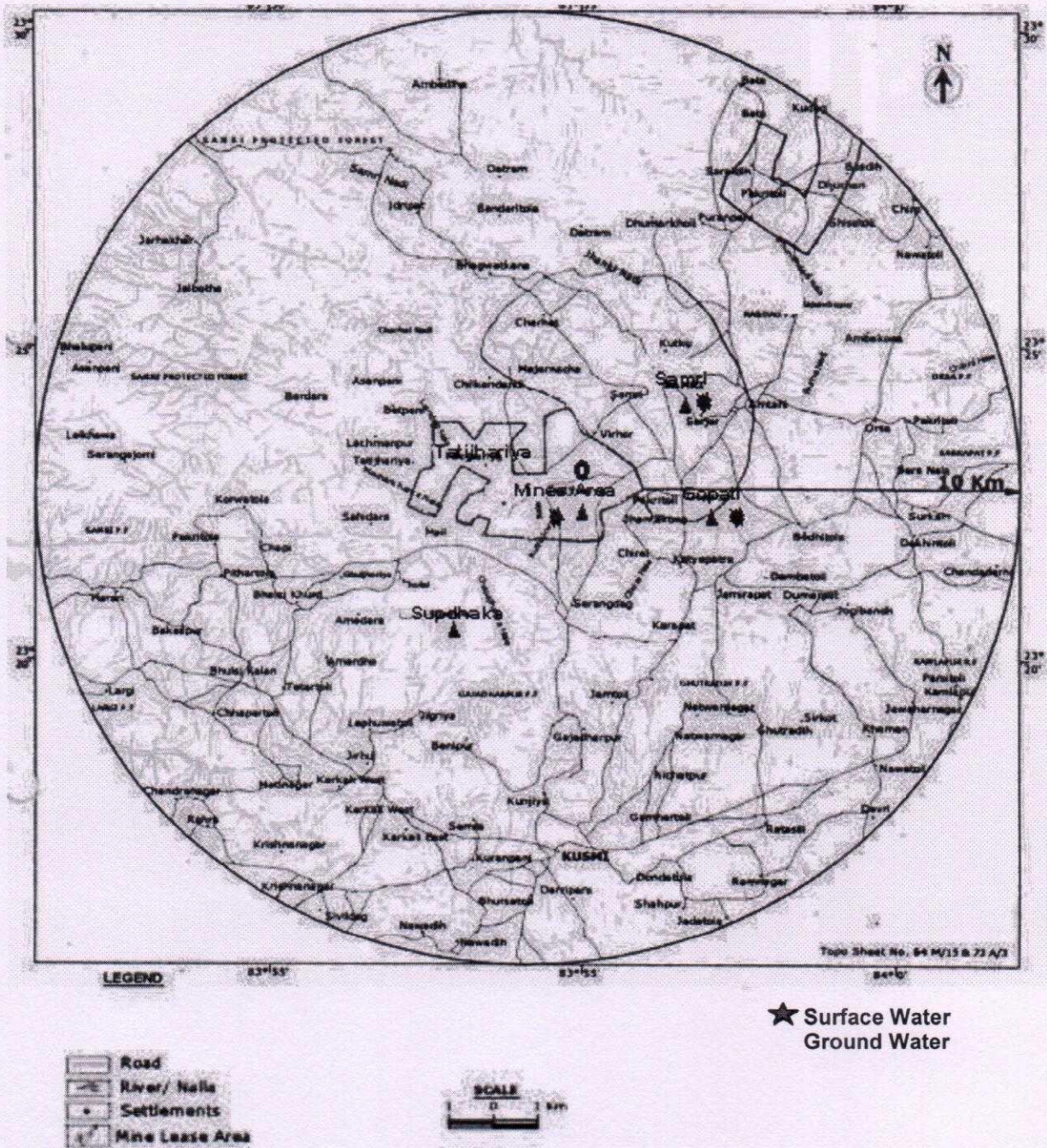


FIG 4: SAMPLING LOCATIONS FOR WATER