

Gujarat Industries Power Company Limited

At. : Nani Naroli, Ta.: Mangrol
Dist. : Surat -394112

Six Monthly Report of Valia and Mangrol Lignite Mines

ENVIRONMENTAL MONITORING & ANALYSIS REPORT

For the period of January to June-2021

Prepared By

ECOSYSTEM RESOURCE MANAGEMENT PVT. LTD.

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PREFACE

Consciousness at national level in the industrial sector is increasing day by day with the focus on environment and sustainable development. A good environment management policy requires a constant effort to analyses and monitors various operations and processes, to generate and transmit this information to the inspecting authority.

As per the Air & Water Consent Orders issued by **Gujarat Pollution Control Board** (GPCB) Gandhinagar & also as per the Environment Clearance certificate issued by Ministry of Environment, Forest and Climate Change (MoEF & CC), Govt. of India, New Delhi, it is mandatory to collect the samples of Air/Gaseous emissions and effluent, to analyses the samples from a recognized laboratory and submit the analysis reports to GPCB & MoEF.

Gujarat Industries Power Company Limited (GIPCL) - Surat Lignite Power

Plant is situated at Village – Nani Naroli, Tal. Mangrol, Dist. Surat. This company engaged in the generation of Electricity. The Industry has awarded the contract for bimonthly monitoring and analysis to M/s. Ecosystem Resource Management Pvt. Ltd. Surat.

Ecosystem Resource Management Pvt. Ltd. is one of the leading companies in the field of Environmental Consultancy Service Providers in India. ERM has a well-equipped and developed **NABL Accredited and MoEF & CC** recognized laboratory to carry out the analysis in air, stack emission, fugitive emission, water & waste water, noise, soil, and solid waste etc.

Scope of work for Valia & Mangrol lignite Mine

I. Ambient Air Monitoring

Sr. No.	No. of stations & Location	Duration	Frequency	Parameters	Method of Analysis
1.	8 Nos within the radius of 10 km from the Core Zone and buffer zone.	24 hours	Bi-Monthly	PM ₁₀	IS 5182 Part 23 2006/Reaffirmed 2017
				PM _{2.5}	SOP No.WI/5.4/02-B/03,Issue No.1Date:01/01/2010
				SO ₂	IS 5182 Part II 2001/Reaffirmed 2017
				NO ₂	IS 5182(Part VI):2006/Reaffirmed 2017
				CO	IS 5182(Part 10):1999/Reaffirmed 2014

II. Dust Fall measurement

Sr. No.	No. of station and locations	Duration	Frequency	Parameters	Method of analysis
1.	8 Nos within the radius of 10 km from the Core Zone and buffer zone.	One Month	Bi-Monthly	Dust fall	As per IS-5182

III. Noise Monitoring:

Sr. No.	Noise of stations and locations	Duration	Frequency	Parameters	Method of analysis
1.	8 Nos at various location within the plant premises	24 hours	Bi-Monthly	Day & night noise level	As per IS 9989 using the Noise level meter.

Weather Monitoring Data

Sr. No.	No. of stations and locations	Duration	Frequency	Parameters	Method of analysis
1.	1 No at site office of the Mine	24 hours	Bi-Monthly	Dry & Wet Bulb Temp. Relative Humidity wind speed & direction max & min. Temperature	As per IS 8829 on hourly basis for 24 hrs by using mechanical Instrument.

Water quality monitoring

Sr. No.	No. of stations and locations	Duration	Frequency	Parameters	Method of analysis
1.	10 Nos. of Bore well & 2 No. of Sump Water sample 2 No. of Pond water	1	Bi-Monthly	Physical parameters, Chemical Parameters, Heavy metals	As per the standard methods for the examination of water and waste water APHA 23 rd Edition 2017 and various Indian standards IS 3025.

**Comparative Ambient Air
Monitoring & Dust fall
Monitoring Report &
Graphical Presentation**

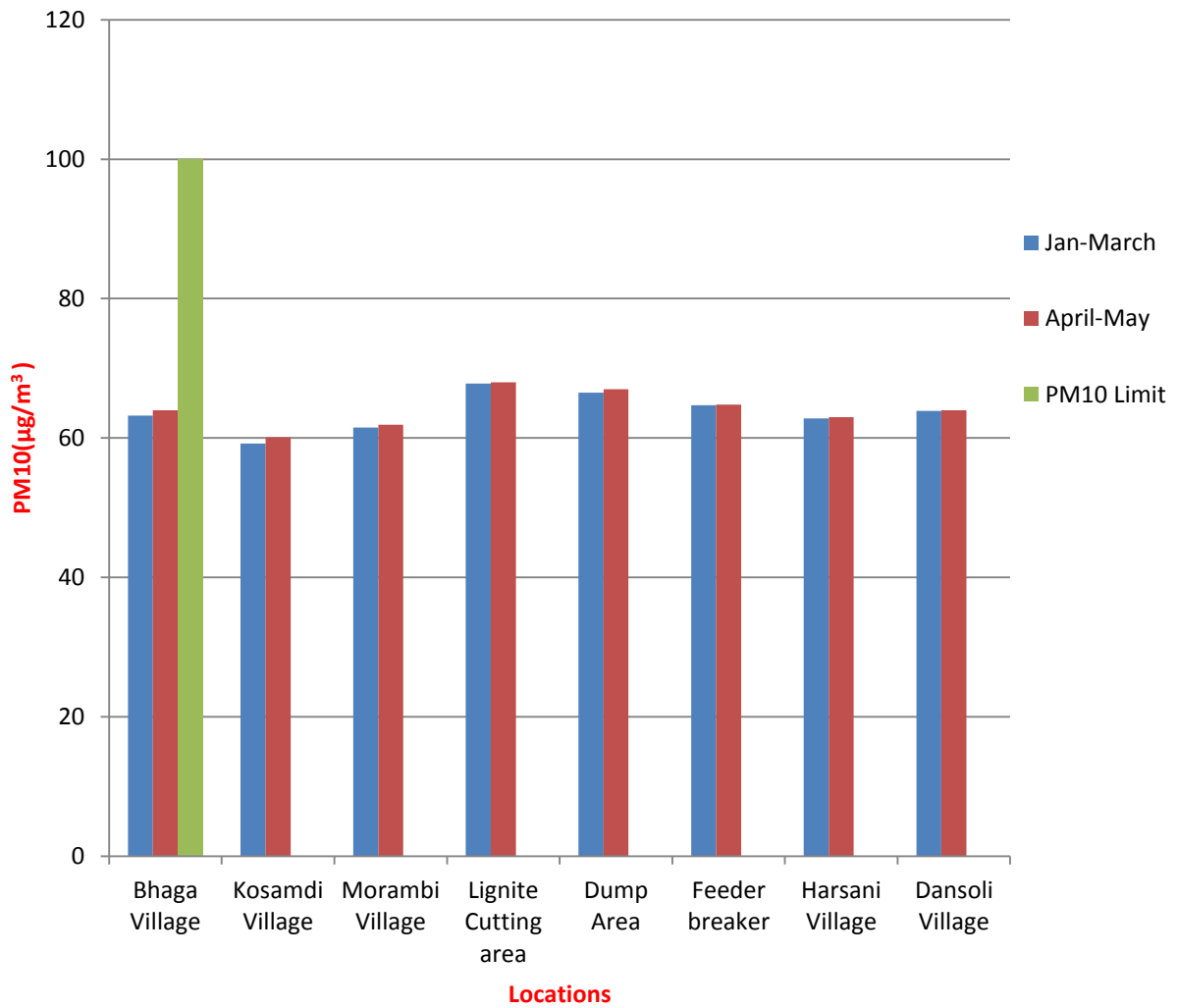
Six Monthly Variation in Ambient Air Quality Data

Parameter: PM₁₀ (Respirable Particulate Matter)

Period: January – 2021 to June – 2021

Sr. No.	Location	Results ($\mu\text{g}/\text{m}^3$)	
		Quarterly Jan to March -2021	Quarterly April to June - 2021
1	Bhaga Village	63.2	64.0
2	Kosamdi Village	59.2	60.1
3	Morambi Village	61.5	61.9
4	Lignite Cutting area	67.8	68.0
5	Dump Area	66.5	67.0
6	Feeder breaker	64.7	64.8
7	Harsani Village	62.8	63.0
8	Dansoli Village	63.9	64.0
	Limit	100($\mu\text{g}/\text{m}^3$)	

Graphical Presentation for the Parameter PM10 at Various Locations



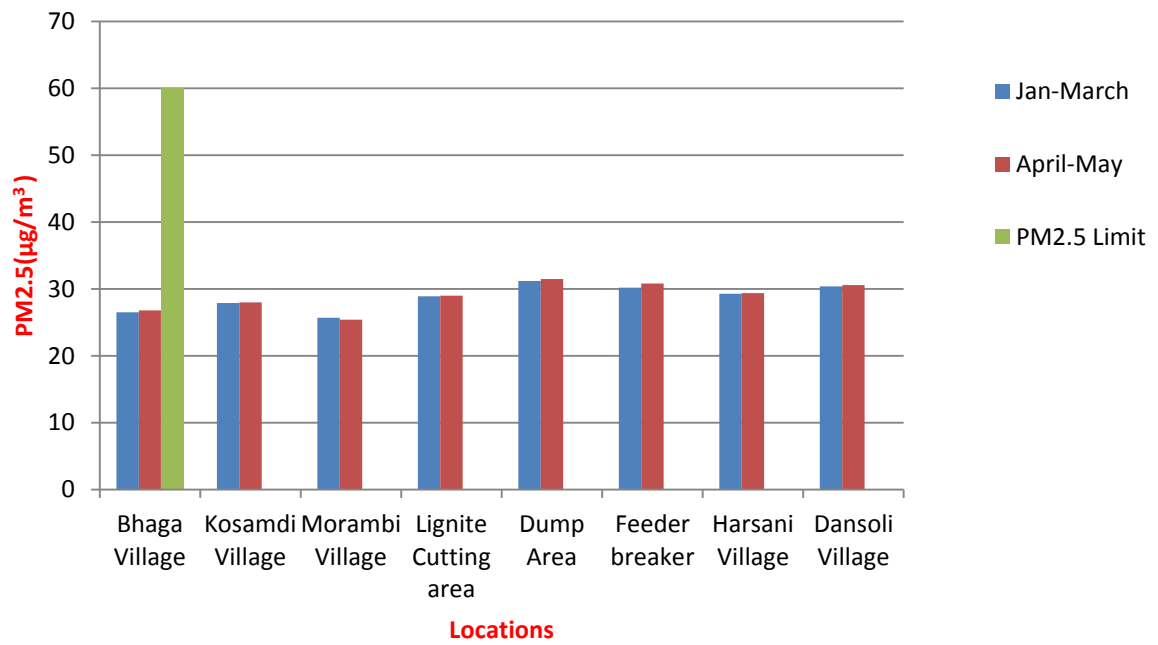
Six Monthly Variation in Ambient Air Quality Data

Parameter: PM_{2.5} (Respirable Particulate Matter)

Period: January – 2021 to June – 2021

Sr. No.	Location	Results ($\mu\text{g}/\text{m}^3$)	
		Quarterly Jan to March -2021	Quarterly April to June - 2021
1	Bhaga Village	26.5	26.8
2	Kosamdi Village	27.9	28.0
3	Morambi Village	25.7	25.4
4	Lignite Cutting area	28.9	29.0
5	Dump Area	31.2	31.5
6	Feeder breaker	30.2	30.8
7	Harsani Village	29.3	29.4
8	Dansoli Village	30.4	30.6
	Limit	60($\mu\text{g}/\text{m}^3$)	

Graphical Presentation for the Parameter PM2.5 at Various Locations



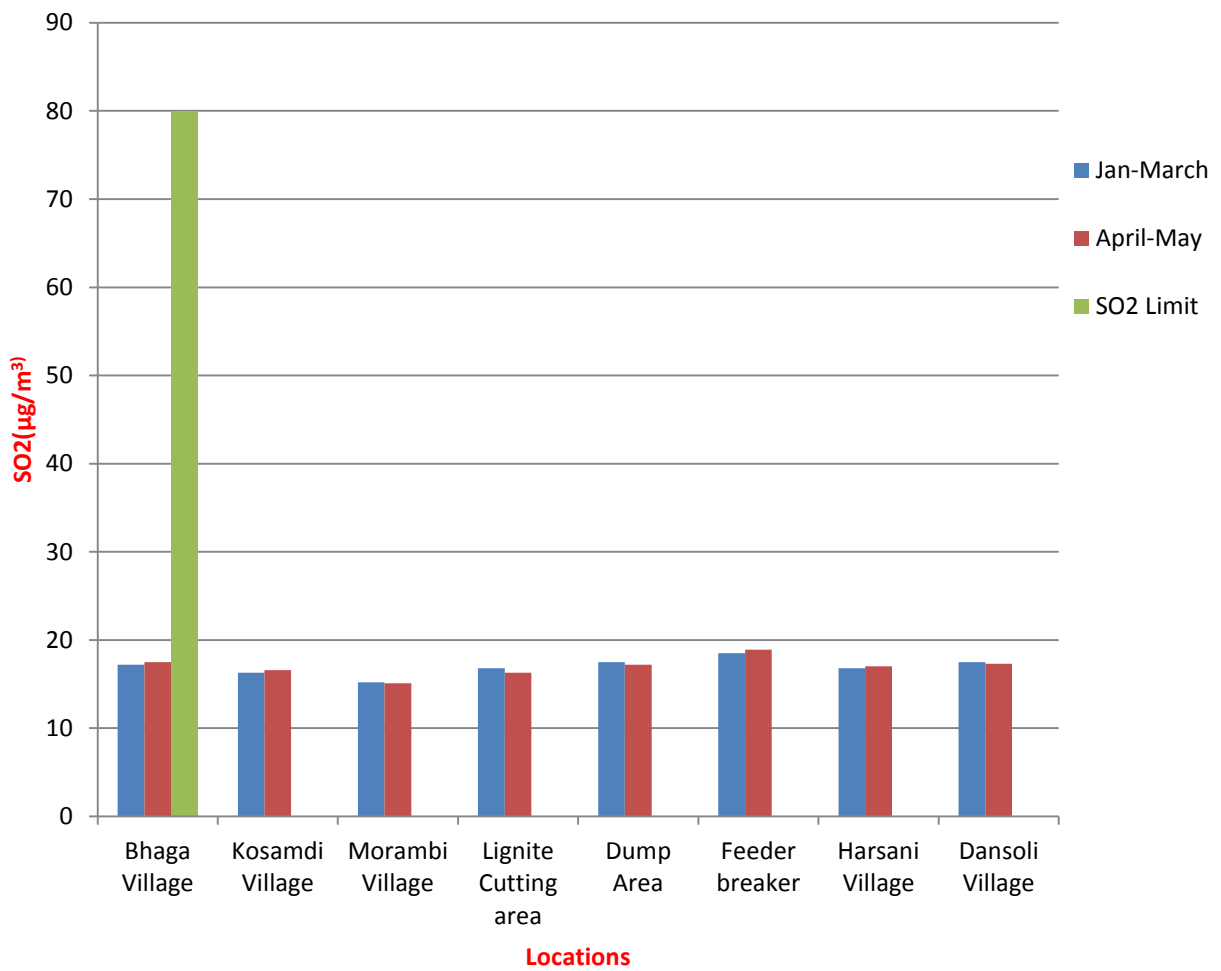
Six Monthly Variation in Ambient Air Quality Data

Parameter: SO₂ (Sulphur Dioxide)

Period: January – 2021 to June – 2021

Sr. No.	Location	Results (µg/m ³)	
		Quarterly Jan to March -2021	Quarterly April to June - 2021
1	Bhaga Village	17.2	17.5
2	Kosamdi Village	16.3	16.6
3	Morambi Village	15.2	15.1
4	Lignite Cutting area	16.8	16.3
5	Dump Area	17.5	17.2
6	Feeder breaker	18.5	18.9
7	Harsani Village	16.8	17.0
8	Dansoli Village	17.5	17.3
	Limit	80 (µg/m ³)	

Graphical Presentation for the Parameter SO2 at Various Locations



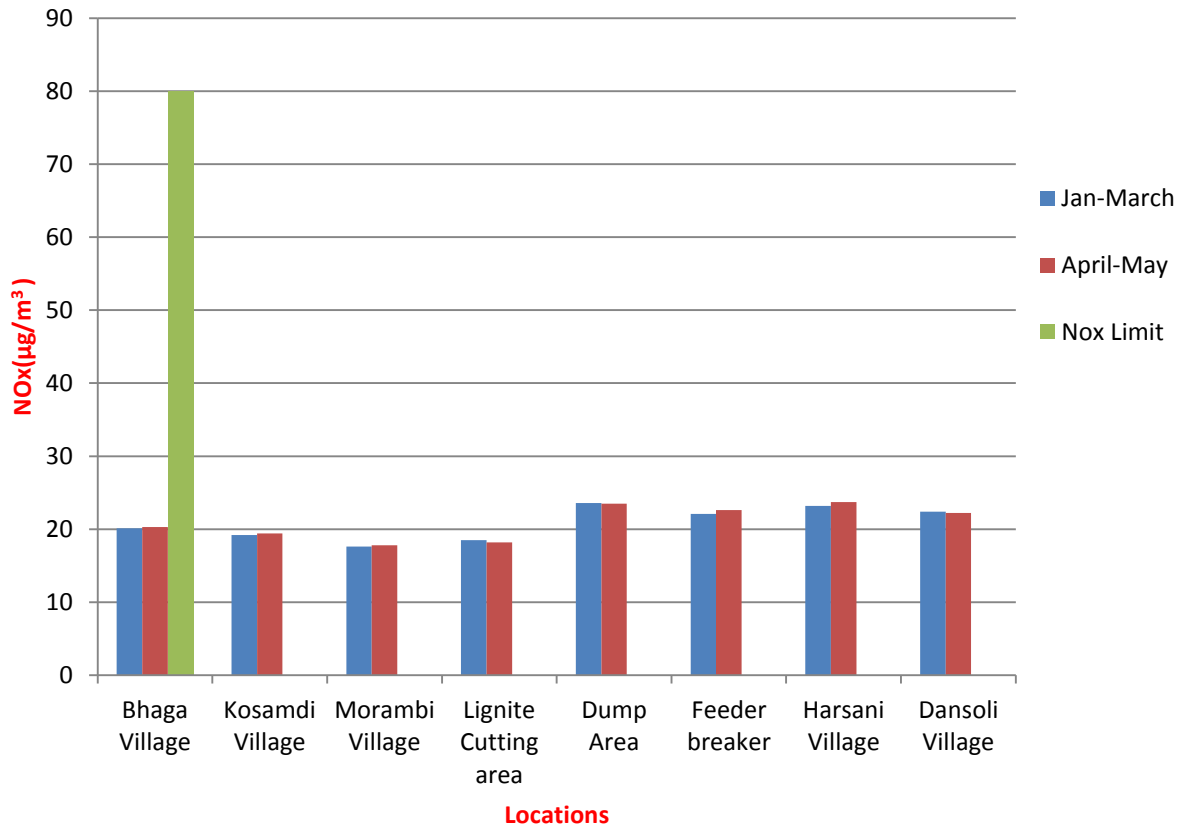
Six Monthly Variation in Ambient Air Quality Data

Parameter: NO_x (Oxides of Nitrogen)

Period: January – 2021 to June – 2021

Sr. No.	Location	Results ($\mu\text{g}/\text{m}^3$)	
		Quarterly Jan to March -2021	Quarterly April to June - 2021
1	Bhaga Village	20.1	20.3
2	Kosamdi Village	19.2	19.4
3	Morambi Village	17.6	17.8
4	Lignite Cutting area	18.5	18.2
5	Dump Area	23.6	23.5
6	Feeder breaker	22.1	22.6
7	Harsani Village	23.2	23.7
8	Dansoli Village	22.4	22.2
	Limit	80($\mu\text{g}/\text{m}^3$)	

Graphical Presentation for the Parameter NOx at Various Locations



Six Monthly Variation in Ambient Air Quality Data

Parameter: CO (Carbon Monoxide)

Period: January – 2021 to June – 2021

Sr. No.	Location	Results ($\mu\text{g}/\text{m}^3$)	
		Quarterly Jan to March -2021	Quarterly April to June - 2021
1	Bhaga Village	995	992
2	Kosamdi Village	970	975
3	Morambi Village	1030	1045
4	Lignite Cutting area	1070	1085
5	Dump Area	1025	1035
6	Feeder breaker	1038	1042
7	Harsani Village	980	988
8	Dansoli Village	930	942
	Limit	2000($\mu\text{g}/\text{m}^3$)	

Graphical Presentation for the Parameter CO at Various Locations



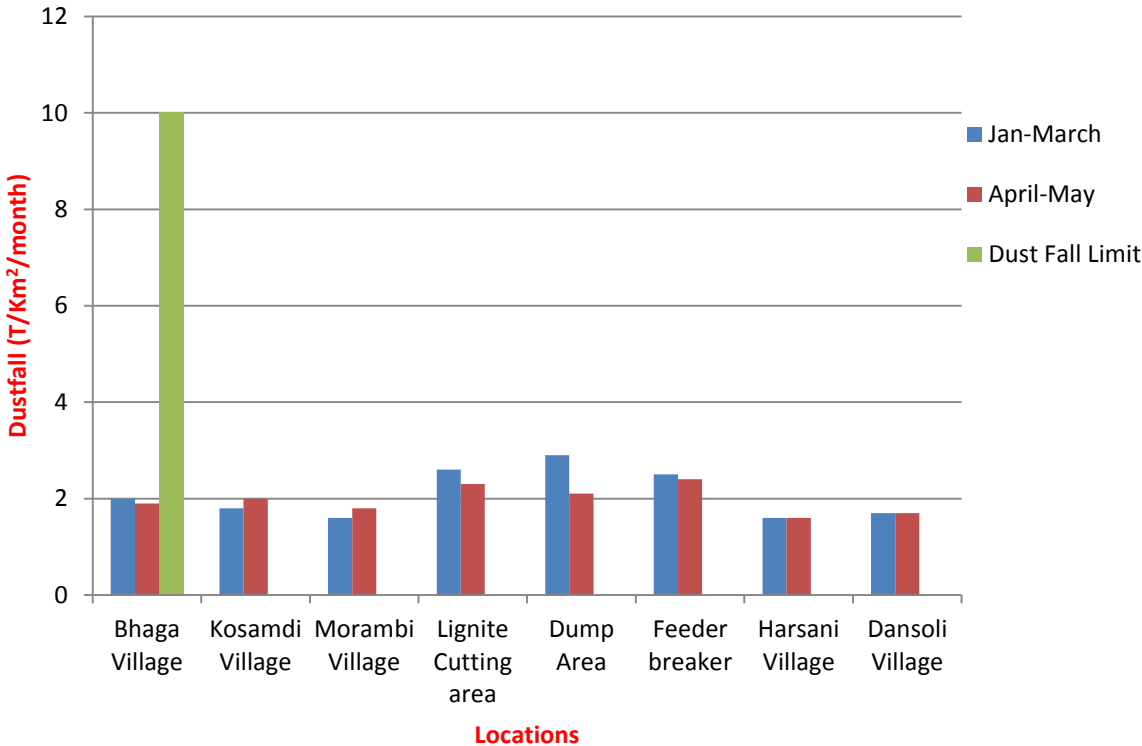
Six Monthly Variation in Ambient Air Quality Data

Parameter: Dust Fall

Period: January – 2021 to June – 2021

Sr. No.	Location	Results (T/Km ² /month)	
		Quarterly Jan to March - 2021	Quarterly April to June - 2021
1	Bhaga Village	2.0	1.9
2	Kosamdi Village	1.8	2.0
3	Morambi Village	1.6	1.8
4	Lignite Cutting area	2.6	2.3
5	Dump Area	2.9	2.1
6	Feeder breaker	2.5	2.4
7	Harsani Village	1.6	1.6
8	Dansoli Village	1.7	1.7
	Limit	10(T/Km ² /month)	

Graphical Presentation for the Parameter Dust Fall at Various Locations



**Comparative Water Analysis
Test Report & Graphical
Presentation**

Six Monthly Variation in bore water Data

Location: Bore water Shah Nallah village

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	28.5	29.1	Shall not exceed 5°c above the receiving water temp.
2	pH@ 25°C	pH unit	7.43	7.54	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	2.8	2.9	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	848	855	2100
6	Total volatile Solids	mg/L	2.7	2.8	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	158	172	1000
11	Sulphate	mg/L	104	125	300
12	Fluoride	mg/L	0.7	0.8	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	1.3	1.5	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.07	0.08	3.0
23	Calcium	mg/L	160	165	--
24	Magnesium	mg/L	23	32	--
25	Percentage Sodium	%	35.2	35.6	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Bhaga Village (Valia Block)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	28	28	Shall not exceed 5°c above the receiving water temp
2	pH@ 25 °C	pH unit	7.34	7.34	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	1.6	1.7	100
5	Total Dissolved Solids (TDS) @180 °C	mg/L	1305	1335	2100
6	Total volatile Solids	mg/L	1.4	1.3	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	517	525	1000
11	Sulphate	mg/L	168	172	300
12	Fluoride	mg/L	0.9	0.8	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	0.8	0.8	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.1	< 0.1	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.01	< 0.01	0.1
18	Copper	mg/L	< 0.05	< 0.05	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.03	< 0.03	5.0
22	Iron	mg/L	0.06	0.07	3.0
23	Calcium	mg/L	126	128	--
24	Magnesium	mg/L	53	56	--
25	Percentage Sodium	%	31.9	32.0	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Bore Well (Charetha Village)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	27	27.8	Shall not exceed 5°c above the receiving water temp
2	pH@ 25°C	pH unit	7.42	7.58	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	3.8	3.9	100
5	Total Dissolved Solids (TDS) @180 °C	mg/L	912	935	2100
6	Total volatile Solids	mg/L	1.6	1.9	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20 °C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	193	211	1000
11	Sulphate	mg/L	103	112	300
12	Fluoride	mg/L	0.5	0.8	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	0.6	0.7	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.06	0.08	3.0
23	Calcium	mg/L	120	165	--
24	Magnesium	mg/L	30	55	--
25	Percentage Sodium	%	30.3	31.5	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Bore Well (Dansoli Village)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	27	27.6	Shall not exceed 5°c above the receiving water temp
2	pH@ 25°C	pH unit	7.42	7.55	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	3.6	3.8	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	1427	1502	2100
6	Total volatile Solids	mg/L	1.9	1.8	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	602	610	1000
11	Sulphate	mg/L	194	193	300
12	Fluoride	mg/L	0.8	0.7	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	0.6	0.8	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.1	< 0.1	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.01	< 0.01	0.1
18	Copper	mg/L	< 0.05	< 0.05	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.03	< 0.03	5.0
22	Iron	mg/L	0.09	0.08	3.0
23	Calcium	mg/L	123	133	--
24	Magnesium	mg/L	59	62	--
25	Percentage Sodium	%	44.5	44.8	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Harsani Village

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	26	26	Shall not exceed 5°c above the receiving water temp
2	pH@ 25°C	pH unit	7.38	7.38	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	3.4	3.4	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	1238	1238	2100
6	Total volatile Solids	mg/L	1.3	1.3	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	251	251	1000
11	Sulphate	mg/L	98	98	300
12	Fluoride	mg/L	0.7	0.7	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	0.6	0.6	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.08	0.08	3.0
23	Calcium	mg/L	106	106	--
24	Magnesium	mg/L	46	46	--
25	Percentage Sodium	%	39.2	39.2	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Bore Well (Kosmadi Village)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	27	27.6	Shall not exceed 5°c above the receiving water temp
2	pH@ 25°C	pH unit	7.27	7.5	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	1.6	1.6	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	1357	1389	2100
6	Total volatile Solids	mg/L	0.8	0.9	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	617	622	1000
11	Sulphate	mg/L	138	140	300
12	Fluoride	mg/L	0.8	0.9	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	1.5	1.4	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.09	0.10	3.0
23	Calcium	mg/L	114	120	--
24	Magnesium	mg/L	50	52	--
25	Percentage Sodium	%	32.4	32.8	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Bore Water (Anoi Village)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	26	26.9	Shall not exceed 5°c above the receiving water temp
2	pH@ 25°C	pH unit	7.37	7.40	
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	1.4	1.5	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	1284	1325	2100
6	Total volatile Solids	mg/L	1.0	1.1	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	534	541	1000
11	Sulphate	mg/L	136	138	300
12	Fluoride	mg/L	0.8	0.9	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	1.2	1.3	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.08	0.09	3.0
23	Calcium	mg/L	129	135	--
24	Magnesium	mg/L	45	49	--
25	Percentage Sodium	%	29.8	30.0	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Mine Water Sump – 2(Valia)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	27	27	Shall not exceed 5°c above the receiving water temp
2	pH@ 25 °C	pH unit	7.36	7.36	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	2.3	3.0	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	953	953	2100
6	Total volatile Solids	mg/L	2.2	2.2	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	188	218	1000
11	Sulphate	mg/L	96	130	300
12	Fluoride	mg/L	0.7	0.8	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	1.1	1.0	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.1	< 0.1	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.01	< 0.01	0.1
18	Copper	mg/L	< 0.05	< 0.05	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.03	< 0.03	5.0
22	Iron	mg/L	0.06	0.08	3.0
23	Calcium	mg/L	97	112	--
24	Magnesium	mg/L	49	44	--
25	Percentage Sodium	%	33.8	34.0	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Mine Water - 1 Mangrol Village

Period: January – 202 to June – 202

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2020	Quarterly April to June - 2020	MoEF Limit
1	Temperature	°C	28	28.5	Shall not exceed 5°c above the receiving water temp
2	pH@ 25 °C	pH unit	7.42	7.78	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	3.1	3.0	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	1024	1035	2100
6	Total volatile Solids	mg/L	1.4	1.5	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20 °C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	202	245	1000
11	Sulphate	mg/L	113	144	300
12	Fluoride	mg/L	0.7	0.8	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	0.8	0.7	--
14	Total Residual Chlorine	mg/L	< 0.1	< 0.1	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.07	0.08	3.0
23	Calcium	mg/L	135	158	--
24	Magnesium	mg/L	37	62	--
25	Percentage Sodium	%	37.1	37.8	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Charetha Shah Nallah down stream

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	28	28.2	Shall not exceed 5°c above the receiving water temp
2	pH@ 25 °C	pH unit	7.32	7.42	5.5-9.0
3	Colour	pt. Co. Scale	<5	<5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	2.0	2.1	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	811	820	2100
6	Total volatile Solids	mg/L	1.0	1.1	--
7	COD	mg/L	<4	<4	250
8	BOD (5 days at 20 °C)	mg/L	<2	<2	30
9	Oil & Grease	mg/L	<0.1	<0.1	10
10	Chloride	mg/L	151	174	1000
11	Sulphate	mg/L	112	125	300
12	Fluoride	mg/L	0.5	0.6	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	0.7	0.8	--
14	Total Residual Chlorine	mg/L	<0.1	<0.1	1.0
15	Free Available Chlorine	mg/L	<0.1	<0.1	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.01	< 0.01	0.1
18	Copper	mg/L	< 0.05	< 0.05	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.03	< 0.03	5.0
22	Iron	mg/L	0.08	0.09	3.0
23	Calcium	mg/L	127	142	--
24	Magnesium	mg/L	27	33	--
25	Percentage Sodium	%	35	36.3	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

Six Monthly Variation in bore water Data

Location: Bore Well (Mosali Village)

Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	27	27.8	Shall not exceed 5°c above the receiving water temp
2	pH@ 25 °C	pH unit	7.44	7.56	5.5-9.0
3	Colour	pt. Co. Scale	< 5	< 5	--
4	Total Suspended Solids (TSS) @105 °C	mg/L	1.7	1.8	100
5	Total Dissolved Solids (TDS) @180 °C	mg/L	1405	1460	2100
6	Total volatile Solids	mg/L	2.0	2.0	--
7	COD	mg/L	< 4	< 4	250
8	BOD (5 days at 20 °C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	491	495	1000
11	Sulphate	mg/L	198	202	300
12	Fluoride	mg/L	0.6	0.7	2.0
13	Phosphate as PO ₄ ³⁻	mg/L	1.4	1.5	--
14	Total Residual Chlorine	mg/L	< 0.10	< 0.10	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.07	0.08	3.0
23	Calcium	mg/L	135	142	--
24	Magnesium	mg/L	37	45	--
25	Percentage Sodium	%	38.4	38.8	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

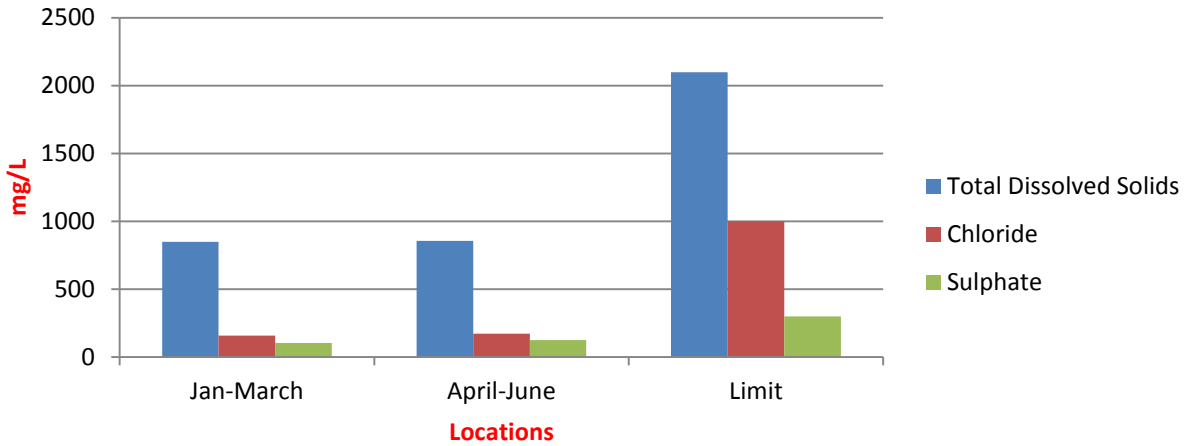
Six Monthly Variation in bore water Data

Location: Pond Water (Shah Nala Village)

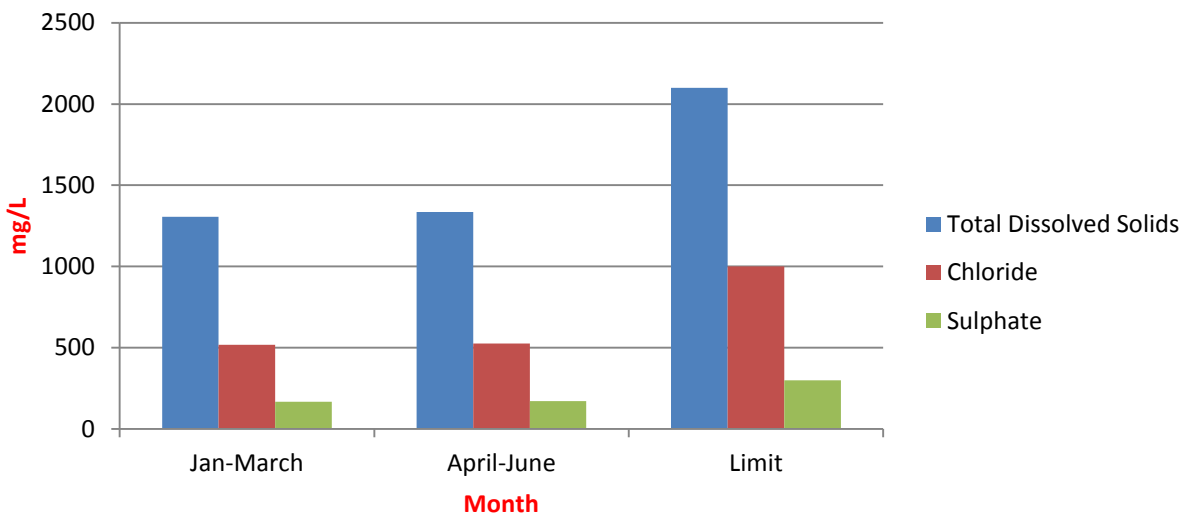
Period: January – 2021 to June – 2021

Sr. No.	Parameter	Unit	Quarterly Jan to March - 2021	Quarterly April to June - 2021	MoEF Limit
1	Temperature	°C	27	27	Shall not exceed 5°c above the receiving water temp
2	pH@ 25°C	pH unit	7.51	7.51	5.5-9.0
3	Colour	pt. Co. Scale	<5	<5	--
4	Total Suspended Solids (TSS) @105°C	mg/L	4.5	4.6	100
5	Total Dissolved Solids (TDS) @180° C	mg/L	1207	1212	2100
6	Total volatile Solids	mg/L	1.9	1.8	--
7	COD	mg/L	5.3	<4	250
8	BOD (5 days at 20° C)	mg/L	< 2	< 2	30
9	Oil & Grease	mg/L	< 0.1	< 0.1	10
10	Chloride	mg/L	334	334	1000
11	Sulphate	mg/L	131	142	300
12	Fluoride	mg/L	0.7	0.8	2.0
13	Phosphate as PO ₄ ⁻⁻⁻	mg/L	1.3	1.4	--
14	Total Residual Chlorine	mg/L	<0.10	<0.10	1.0
15	Free Available Chlorine	mg/L	< 0.01	< 0.01	--
16	Phenolic Compound	mg/L	< 0.01	< 0.01	1.0
17	Lead	mg/L	< 0.05	< 0.05	0.1
18	Copper	mg/L	< 0.03	< 0.03	3.0
19	Hexavalent Chromium	mg/L	< 0.03	< 0.03	0.1
20	Total Chromium	mg/L	< 0.03	< 0.03	2.0
21	Zinc	mg/L	< 0.1	< 0.1	5.0
22	Iron	mg/L	0.06	0.08	3.0
23	Calcium	mg/L	139	158	--
24	Magnesium	mg/L	30	48	--
25	Percentage Sodium	%	38.7	38.9	--
26	Total Coliform(MPN)	Present/ Absent	Absent	Absent	--
27	Bioassay Test	% Survival of fish after 96 hrs in 100% effluent	100	100	90%Survival of fish in 96 Hours in 100% of effluent

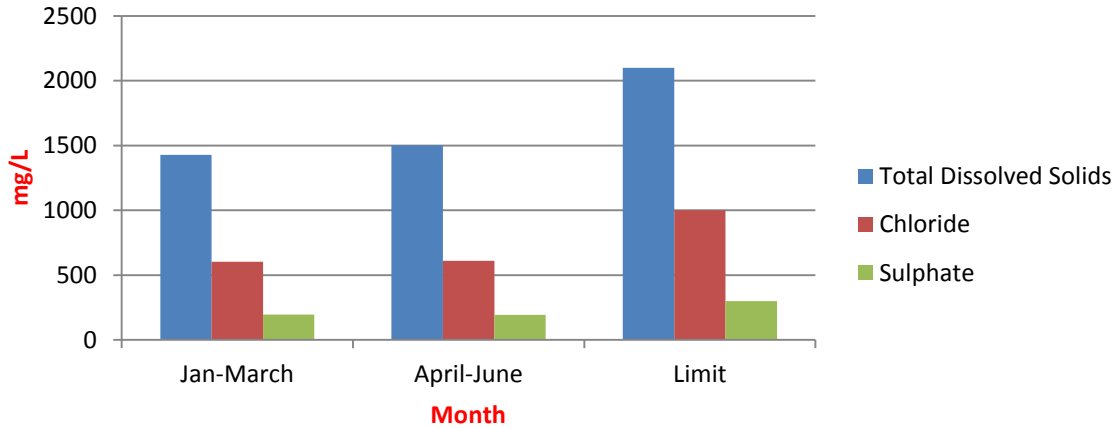
Graphical Presentation for the variation of TDS, Chloride, Sulphate Bore water Shah Nallah village



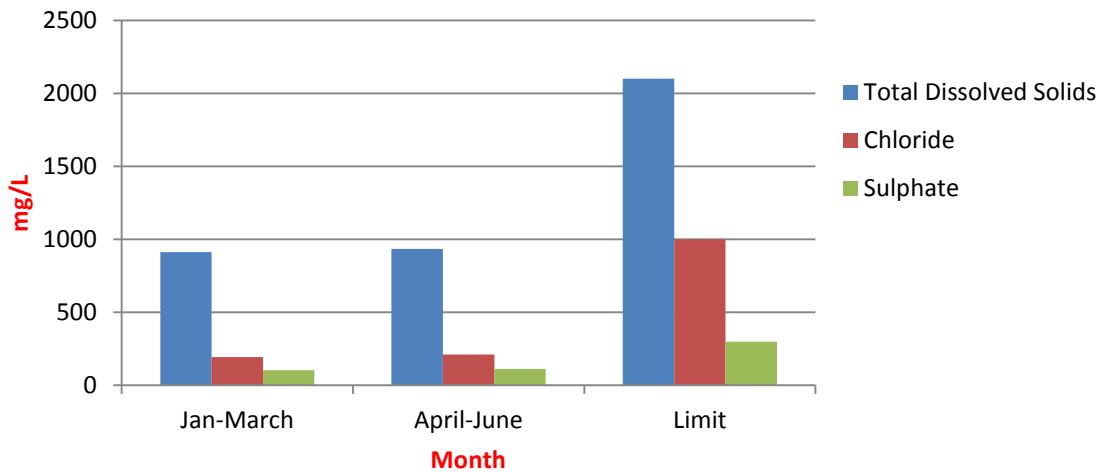
Graphical Presentation for the variation of TDS, Chloride, Sulphate Bhaga Village (Valia Block)



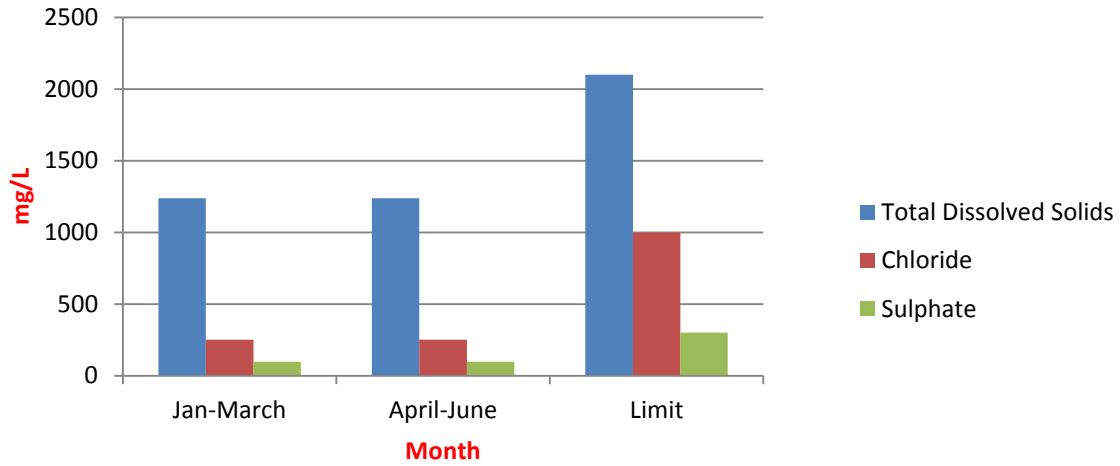
Graphical Presentation for the variation of TDS, Chloride, Sulphate Bore Well (Dansoli Village)



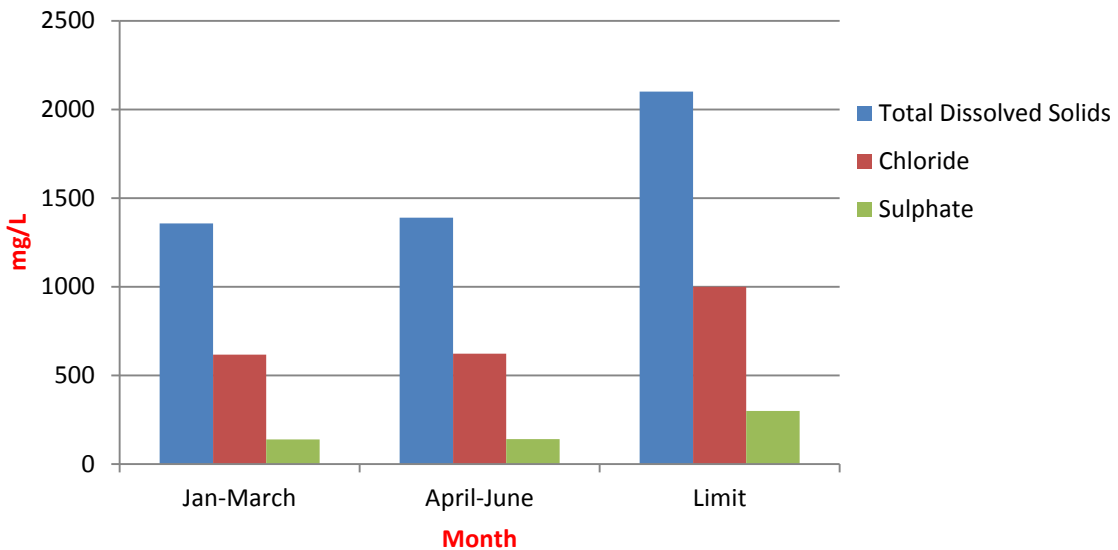
Graphical Presentation for the variation of TDS, Chloride, Sulphate Bore Well (Charetha Village)



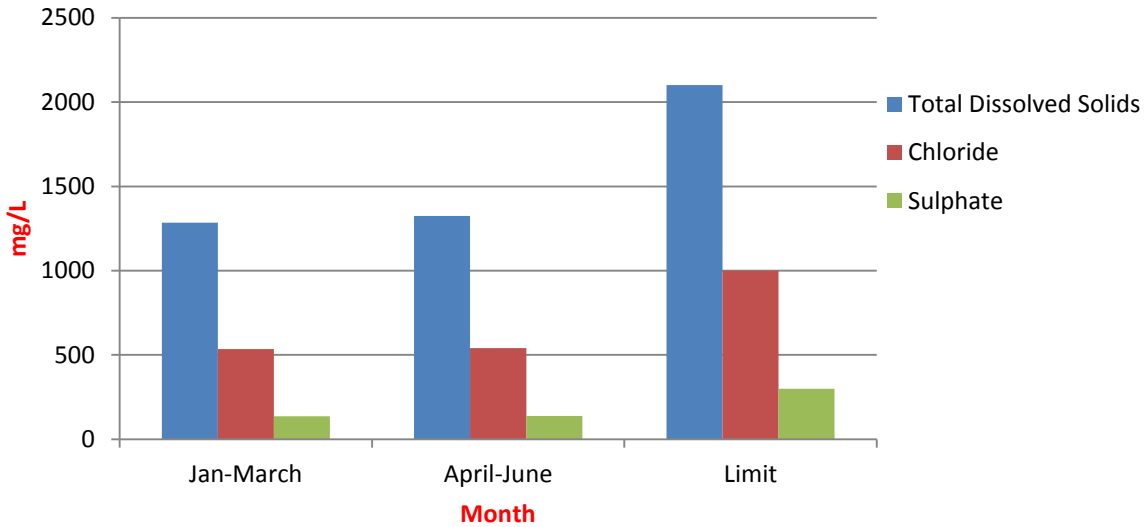
Graphical Presentation for the variation of TDS, Chloride, Sulphate Harsani Village



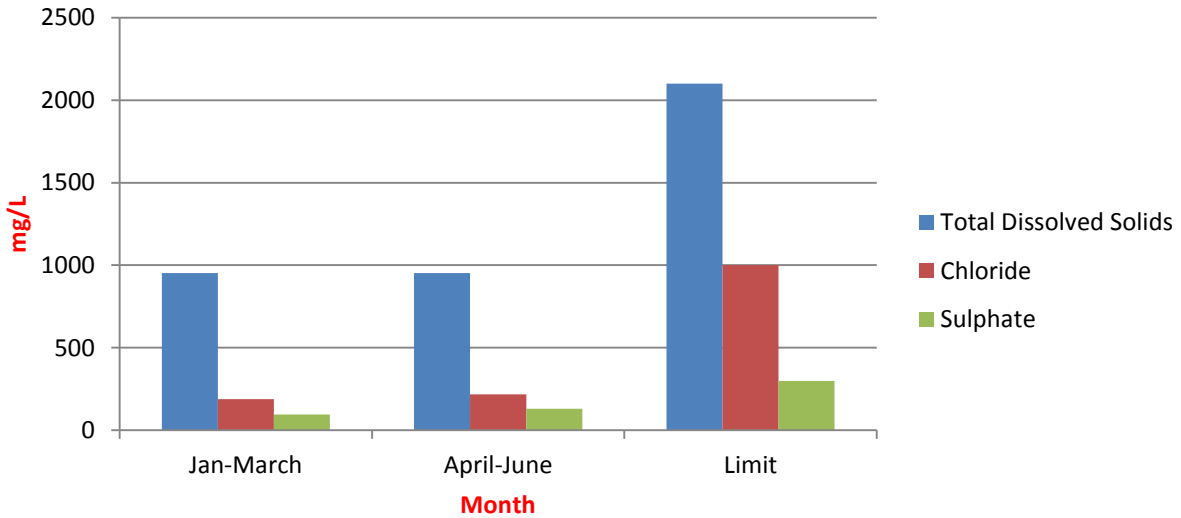
Graphical Presentation for the variation of TDS, Chloride, Sulphate Bore Well (Kosmadi Village)



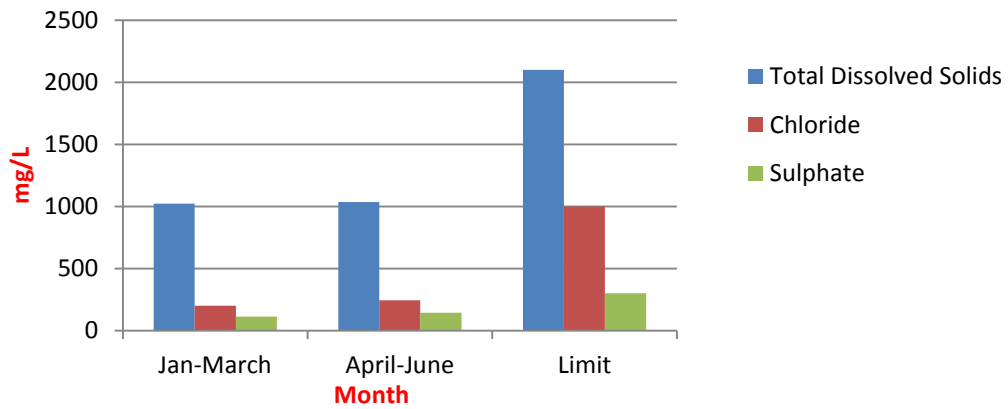
Graphical Presentation for the variation of TDS, Chloride, Sulphate Bore Water (Anoi Village)



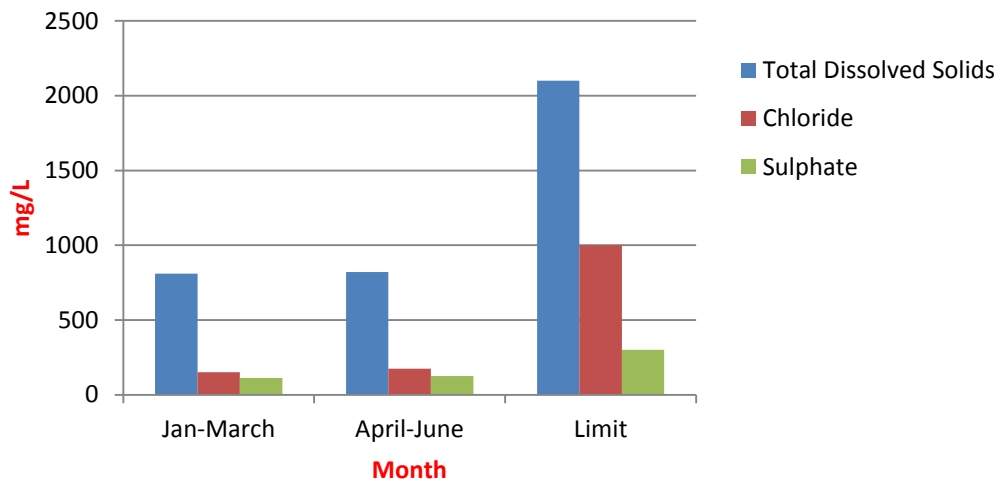
Graphical Presentation for the variation of TDS, Chloride, Sulphate Mine Water Sump – 2(Valia)



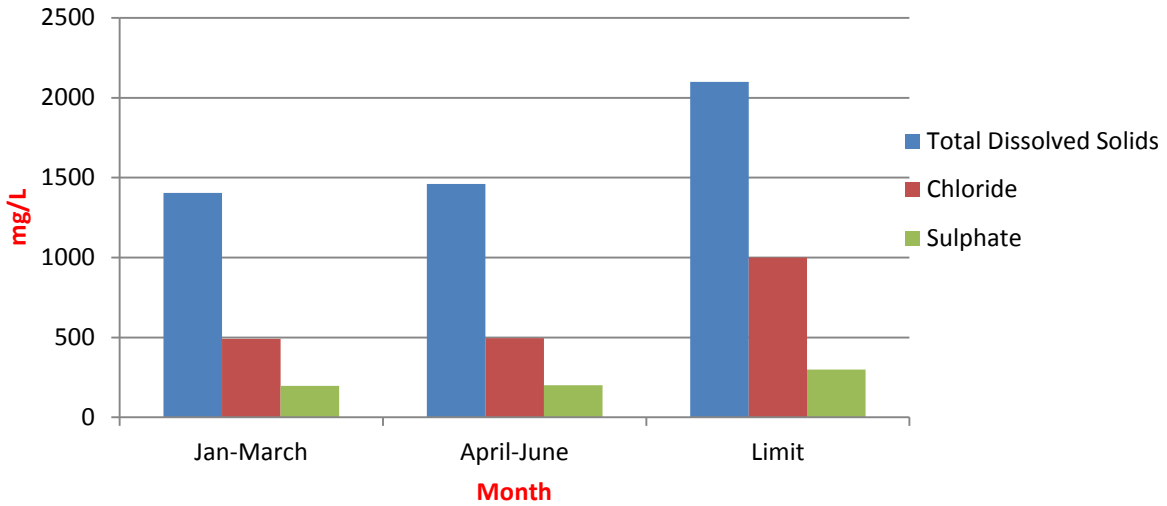
Graphical Presentation for the variation of TDS, Chloride, Sulphate Mine Water - 1 Mangrol Village



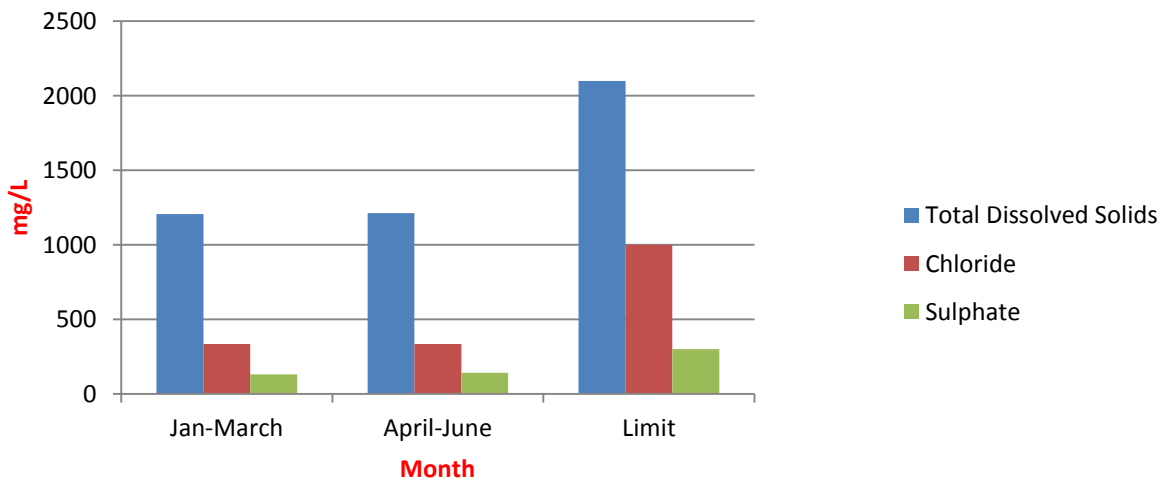
Graphical Presentation for the variation of TDS, Chloride, Sulphate Charetha Shah Nallah down stream



Graphical Presentation for the variation of TDS, Chloride, Sulphate Bore Well (Mosali Village)



Graphical Presentation for the variation of TDS, Chloride, Sulphate Pond Water (Shah Nala Village)



**Comparative Noise
Monitoring Report &
Graphical Presentation**

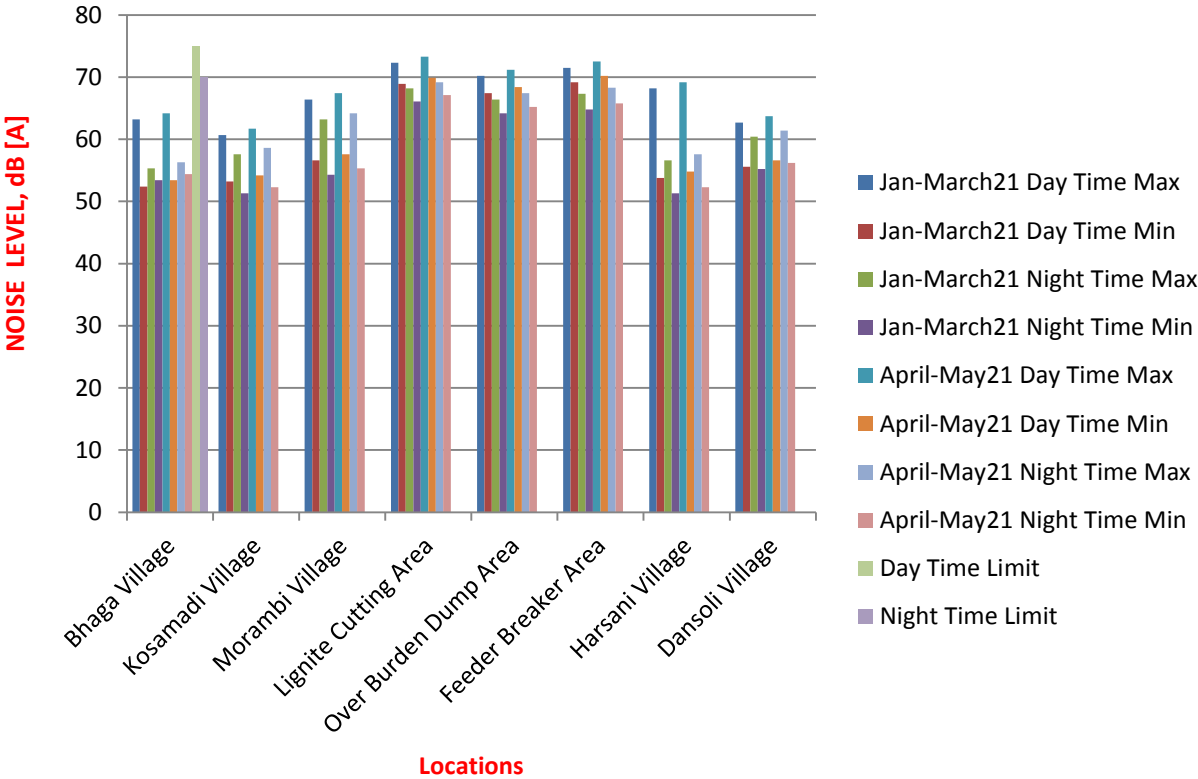
Six Monthly Variations in Noise Level Data

Parameter: Noise

Period: January – 2021 to June – 2021

SR. NO.	LOCATION	NOISE LEVEL, dB [A]							
		Quarterly Jan to March - 2021				Quarterly April to June - 2021			
		DAY Time		Night Time		DAY Time		Night Time	
		Max	Min	Max	Min	Max	Min	Max	Min
1	Bhaga Village	63.2	52.4	55.3	53.4	64.2	53.4	56.3	54.4
2	Kosamadi Village	60.7	53.2	57.6	51.3	61.7	54.2	58.6	52.3
3	Morambi Village	66.4	56.6	63.2	54.3	67.4	57.6	64.2	55.3
4	Lignite Cutting Area	72.3	68.9	68.2	66.1	73.3	69.9	69.2	67.1
5	Over Burden Dump Area	70.2	67.4	66.4	64.2	71.2	68.4	67.4	65.2
6	Feeder Breaker Area	71.5	69.2	67.3	64.8	72.5	70.2	68.3	65.8
7	Harsani Village	68.2	53.8	56.6	51.3	69.2	54.8	57.6	52.3
8	Dansoli Village	62.7	55.6	60.4	55.2	63.7	56.6	61.4	56.2
	GPCB limit	75 (dB)		70(dB)		75 (dB)		70(dB)	

Graphical Presentation for the Parameter Noise Level at Various Locations



**Comparative Micro
Meteorological Data and
Wind rose & Wind
Frequency Distribution**

Six Monthly Variations in Micro-meteorological data

Period: January – 2021 to June – 2021

Dry Bulb Temperature (°C)		
Time in Hrs.	Quarterly Jan to March - 2021	Quarterly April to June - 2021
10.00	29	34
11.00	30	35
12.00	30	36
13.00	32	34
14.00	33	35
15.00	30	36
16.00	29	33
17.00	28	34
18.00	27	35
19.00	27	36
20.00	26	35
21.00	26	34
22.00	26	31
23.00	26	32
00.00	26	33
01.00	26	30
02.00	26	31
03.00	26	32
04.00	25	30
05.00	25	32
06.00	25	33
07.00	26	32
08.00	27	33
09.00	27	34
Maximum	33	36
Minimum	25	30
Average	27.5	33

Six Monthly Variations in Micrometeorological data

Period : January – 2021 to June – 2021

Wet Bulb Temperature (°C)		
Time in Hrs.	Quarterly Jan to March - 2021	Quarterly April to June - 2021
10.00	25.2	30
11.00	27.4	29
12.00	28.6	31
13.00	28.2	29
14.00	29.6	30
15.00	28.4	31
16.00	28.1	33
17.00	27.6	31
18.00	25.3	30
19.00	24.8	27
20.00	24.2	28
21.00	24.3	29
22.00	24.2	31
23.00	24.5	30
00.00	23.9	28
01.00	22.3	26
02.00	23.5	27
03.00	22.5	28
04.00	22.4	26
05.00	22.2	28
06.00	22.6	29
07.00	22.8	30
08.00	23.5	31
09.00	23.6	30
Maximum	29.6	33
Minimum	22.2	26
Average	25.0	29.5

Six Monthly Variations in Micrometeorological data

Period : January – 2021 to June – 2021

Relative Humidity %		
Time in Hrs.	Quarterly Jan to March - 2021	Quarterly April to June - 2021
10.00	62	68
11.00	55	64
12.00	53	63
13.00	48	57
14.00	41	48
15.00	50	34
16.00	55	45
17.00	59	58
18.00	69	71
19.00	72	72
20.00	76	74
21.00	80	75
22.00	82	76
23.00	82	77
00.00	81	78
01.00	83	79
02.00	84	77
03.00	83	76
04.00	82	74
05.00	82	72
06.00	78	70
07.00	70	69
08.00	61	68
09.00	56	66
Maximum	84	79
Minimum	41	34
Average	68.5	56.5

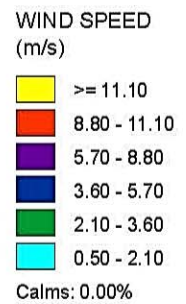
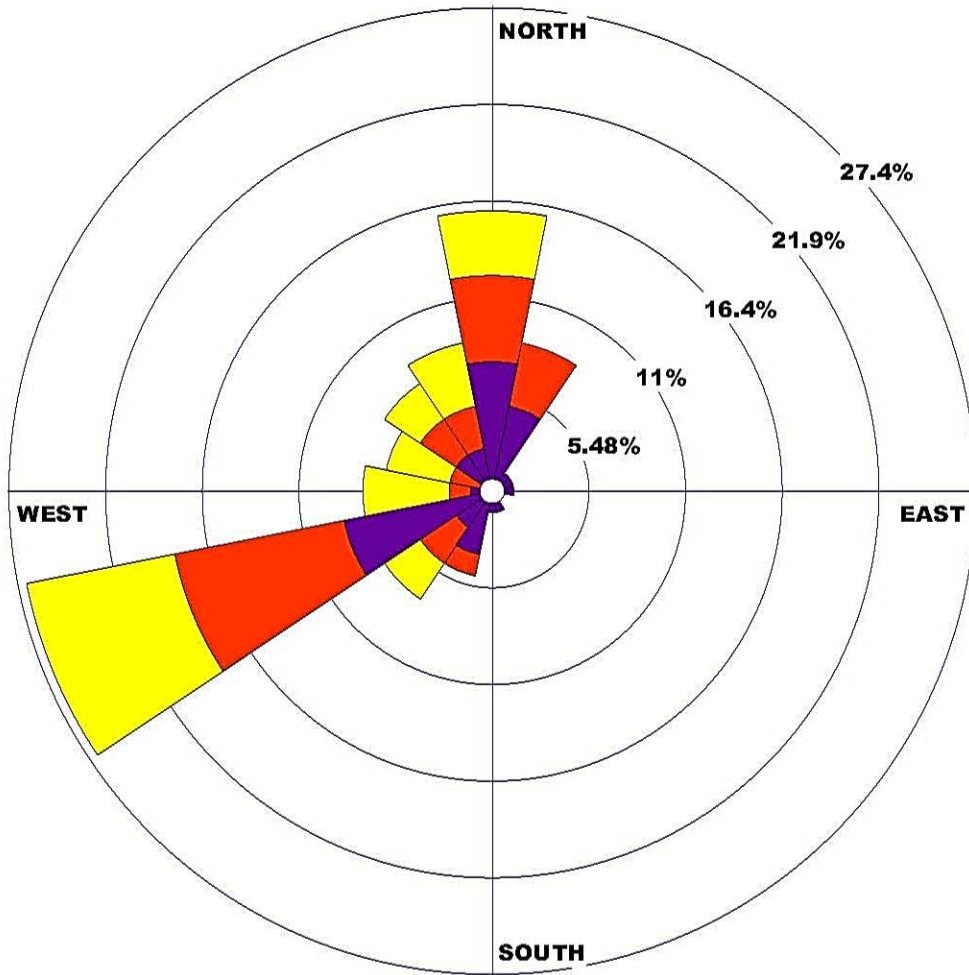
Six Monthly Variations in Micrometeorological data

Period : January – 2021 to June – 2021

Wind Speed (km/hour)		
Time in Hrs.	Quarterly Jan to March - 2021	Quarterly April to June - 2021
10.00	8	6
11.00	12	7
12.00	14	8
13.00	12	9
14.00	13	10
15.00	16	6
16.00	15	7
17.00	14	8
18.00	15	9
19.00	12	11
20.00	11	10
21.00	13	7
22.00	12	8
23.00	10	9
00.00	10	10
01.00	9	9
02.00	9	8
03.00	8	9
04.00	8	6
05.00	7	8
06.00	9	9
07.00	8	7
08.00	10	8
09.00	13	9
Maximum	16	11
Minimum	7	6
Average	11.2	8.5

WIND ROSE PLOT:
M/s. Gujarat Industries Power Company Limited
Valia Mangrol Mines

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: Start Date: 25-02-2021 - 00:00 End Date: 05-06-2021 - 10:00	COMPANY NAME: M/s. Gujarat Industries Power Company Limited	
		MODELER: M/s. Ecosystem Resource Management Pvt. Ltd	
	CALM WINDS: 0.00%	TOTAL COUNT: 81 hrs.	
	AVG. WIND SPEED: 10.06 m/s	PROJECT NO.:	

Wind Class Frequency Distribution

