

ENVIRONMENTAL MONITORING REPORT

FOR

APRIL 2017

FOR

BORGA IRON ORE MINE

OF

M/S. SOCIEDADE TIMBLO IRMAOS
LIMITADA.,

REPRESENTED BY

M/S. PANDURONGA TIMBLO INDUSTRIAS,
GOA

Prepared by



COSMO CONSCIOUS RESEARCH LABORATORY

(Environmental Laboratory, Recognized by MoEF (03.01.2014 to 02.01.2019)

and ISO 9001:2008 & OSHAS 18001:2007 Certified)

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MAY 2017

CCRL - QC - 06/R0



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CERTIFICATE

This is to certify that the sampling, testing and analysis of environmental parameters (Air & Water) of Borga Iron Ore Mine of M/s. Sociedade Timblo Irmaos Limitada Represented by M/s. Panduronga Timblo Industrias is carried -out for the month of April 2017. The monitoring is done as per the requirement of our client and the methods adopted are as per the standards prescribed. The results obtained and reported are true and correct to the best of our knowledge.

For Cosmo Conscious Research Laboratory

Date: 10.05.2017


(M. Shashikala)
Chief Executive

(Moef Gazette No: 21, Valid up to 02.01.2019)



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AMBIENT AIR QUALITY MONITORING DATA

Project: Borga Iron Ore Mine
Client: M/s. Sociedade Timblo Irmaos Limitada,
Represented by M/s. Panduronga Timblo Industrias

Report no: I A
Month: April 2017
Unit: µg/ m³

Name of the Station, Date of sample collection	Particulars of sample collected							
	Gaseous concentration						Dust concentration	
	SO ₂			NO ₂			PM ₁₀	PM _{2.5}
	I shift	II shift	III shift	I shift	II shift	III shift		
UAI. Utkash High School:								
05.04.2017	17	13	8	12	16	14	56	16
06.04.2017	16	13	10	14	16	12	55	12
12.04.2017	19	9	12	12	21	13	56	12
13.04.2017	13	17	8	18	14	22	68	17
21.04.2017	18	13	9	10	18	16	56	15
22.04.2017	17	13	9	14	16	16	55	12
28.04.2017	11	16	10	13	20	13	56	16
29.04.2017	19	11	9	16	20	12	56	12
Avg	12.92			15.33			57.25	14.00
PAI. Praveen Pal Desai property, Rivona:								
05.04.2017	16	13	18	19	14	10	59	16
06.04.2017	16	12	8	11	15	18	62	12
12.04.2017	20	13	8	14	9	11	73	16
13.04.2017	11	9	13	16	15	12	41	15
21.04.2017	16	12	19	20	18	10	65	19
22.04.2017	17	16	9	11	12	17	57	12
28.04.2017	19	16	15	9	17	10	63	17
29.04.2017	21	15	10	14	17	19	56	13
Avg	14.25			14.08			59.50	15.00

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Name of the Station, Date of sample collection	Particulars of sample collected							
	Gaseous concentration						Dust concentration	
	SO ₂			NO ₂			PM ₁₀	PM _{2.5}
	I shift	II shift	III shift	I shift	II shift	III shift		
AAIII. Anand B. Shirodkan house, Galli:								
05.04.2017	9	17	8	15	14	10	40	14
06.04.2017	14	20	15	19	14	21	50	13
12.04.2017	16	10	11	10	13	21	50	10
13.04.2017	21	16	20	8	18	19	55	20
21.04.2017	9	12	21	20	17	11	53	15
22.04.2017	15	19	11	18	14	17	56	20
28.04.2017	9	14	17	18	21	10	51	15
29.04.2017	13	16	10	9	15	11	45	17
Avg.	14.29			15.13			50.00	15.50
MAIV. Mohan Sawalkam House, Zambaulim:								
05.04.2017	8	12	20	16	16	11	56	13
06.04.2017	20	16	12	16	17	14	54	20
12.04.2017	8	15	12	14	13	19	60	14
13.04.2017	16	17	12	11	19	15	59	16
21.04.2017	9	16	18	15	15	11	54	14
22.04.2017	16	10	18	18	13	21	51	14
28.04.2017	8	19	17	14	13	10	52	13
29.04.2017	17	8	12	10	13	17	47	12
Avg.	14.00			14.63			54.13	14.50

NAAQS Standard				
24 hrly average	80	80	100	60
Method adopted	IS 5182 (part 2) :2001 Improved West and Gaeke method	IS 5182 (part 6): 2006 Jacob & Hochheiser method	IS 5182 (Part 4) : 1999 Gravimetric method	Gravimetric method
Sample collected by	COSMO CONSCIOUS RESEARCH LABORATORY			

ANALYZED BY:

(B. Maruthi Rao)
(B. Maruthi Rao)
Govt. Analyst

VERIFIED BY:

(P. Harika)
(P. Harika)
Environmental Officer

(M. Shashikala)
(M. Shashikala)
HEAD OF THE LABORATORY



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SOURCE EMISSION AIR QUALITY MONITORING DATA

Project: Borga Iron Ore Mine
Client: M/s. Sociedade Timblo Irmaos Limitada,
Represented by M/s. Panduronga Timblo Industrias

Report no: I B
Month: April 2017
Unit: $\mu\text{g}/\text{m}^3$

Name of the Station, Date of sample collection	Particulars of sample collected							
	Gaseous concentration						Dust concentration	
	SO ₂			NO ₂			PM ₁₀	PM _{2.5}
	I shift	II shift	III shift	I shift	II shift	III shift		
SAI. Mining Area								
05.04.2017	13	10	15	16	17	10	63	13
06.04.2017	17	16	19	15	14	17	78	15
12.04.2017	9	19	11	18	17	16	55	17
13.04.2017	11	16	17	19	11	18	56	17
21.04.2017	13	10	15	16	17	10	60	13
22.04.2017	17	16	19	15	14	17	77	15
28.04.2017	14	12	16	12	20	10	64	13
29.04.2017	13	18	20	17	16	13	81	15
SAll. Haulage:								
05.04.2017	20	14	10	9	18	14	79	13
06.04.2017	20	15	10	17	14	9	70	15
12.04.2017	20	15	11	19	16	12	61	15
13.04.2017	9	13	16	19	21	17	64	21
21.04.2017	22	15	10	8	17	12	86	13
22.04.2017	20	15	10	17	14	9	70	15
28.04.2017	19	13	9	14	17	10	63	13
29.04.2017	15	17	10	18	14	8	72	15

MOEF Gazette notification no.G.S.R. 809(E) dated 04.10.2010	Fugitive Emission Standards : Particulate matter-1200 ($\mu\text{g}/\text{m}^3$)			
Method adopted	IS 5182 (part 2) :2001 Improved West and Gaeke method	IS 5182 (part 6): 2006 Jacob & Hochheiser method	IS 5182 (Part 4) : 1999 Gravimetric method	Gravimetric method
Sample collected by	COSMO CONSCIOUS RESEARCH LABORATORY			

ANALYZED BY:

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WATER QUALITY MONITORING DATA (GROUND WATER)

Report no: II A

1. Name of the Project : Barga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Well in PII Property within the lease area (Sr.No. 73)
5. Particulars of sample collected : Well water
6. Sample code : BRGW1
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results		Drinking water specification Standards as per IS:10500:2012	
				April '17		Desirable Limits	Permissible Limits
PHYSICAL							
1.	Colour	IS: 3025 (PART 14)- 1984, RA-2012 Platinum cobalt Method	Hazen units	Under range	5		15
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	34.80	-		-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	24.00	-		-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	16.00	500		2000
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	6.85	6.5 to 8.5		No relaxation
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	0.20	1		5
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	5	-		-

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ANAB

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S. no.	Parameters	Protocol	Unit	Results April '17	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
CHEMICAL						
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	5.70	-	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	<1	-	-
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	4	-	-
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.010	-	-
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.30	-	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.20	-	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	0.80	75	200
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	1.94	30	100
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	10	200	600
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	4.45	250	1000
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ ²⁻ -E (P.NO.4-190-191) Turbidimetric method	mg/L	0.50	200	400
19.	Fluoride as F	APHA 22 nd edition 4500-F-D. (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.76	1	1.50
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	1.00	45	No relaxation
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	10	200	600
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	4.00	-	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	-	-

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S. no.	Parameters	Protocol	Unit	Results		Drinking water specification Standards as per IS:10500:2012	
				April '17		Desirable Limits	Permissible Limits
Trace metals							
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.30	No relaxation	No relaxation
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.02	No relaxation	No relaxation
26.	Manganese as	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10	0.30	0.30
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.05	1.50	1.50
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.008	5	15	15
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.01	No relaxation	No relaxation
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10	No relaxation	No relaxation
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.020	0.05	No relaxation	No relaxation
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	0.03	0.20	0.20
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.001	No relaxation	No relaxation

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S. no.	Parameters	Protocol	Unit	Drinking water specification Standards as per IS:10500:2012	
				Results April.'17	Desirable Limits Permissible Limits
Microbiological					
34.	Total Coliform count	APHA 22 nd Edition 9222-8 (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample
35.	Escherichia coli count	APHA 22 nd Edition 9222-8 (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable In any 100 ml sample


Note: ND-Not detected, BDL: Below detectable limit.

INFERENCE: As per IS : 10500 Standards (for drinking water) Report Status :-
All parameters confirm to the standard for drinking water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt. Analyst

2.  (G. Dhavaleshwar)
Govt. Analyst

 (P. Harika)
Environmental Officer

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WATER QUALITY MONITORING DATA (GROUND WATER)

Report no: II B

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Well in Praveen Desai Property (Sr.No. 79/11)
5. Particulars of sample collected : Well water
6. Sample code : BRGW2
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results		Drinking water specification Standards as per IS:10500:2012	
				April, '17		Desirable Limits	Permissible Limits
PHYSICAL							
1.	Colour	IS: 3025 (PART 14)- 1984, RA-2012 Platinum cobalt Method	Hazen units	Under range	5		15
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	29.60	-		-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	31	-		-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	21	500		2000
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	6.95	6.5 to 8.5		No relaxation
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	0.60	1		5
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	7	-		-

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S. no.	Parameters	Protocol	Unit	Results	Drinking water specification Standards as per IS:10500:2012	
				April '17	Desirable Limits	Permissible Limits
CHEMICAL						
8.	Dissolved Oxygen	IS:3025 (part 38)-1988, RA-2014 Winkler titrimetric azide modification	mg/L	5.80	-	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	<1	-	-
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	4	-	-
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.010	-	-
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.80	-	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.80	-	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	0.80	75	200
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	0.97	30	100
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	6.00	200	600
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	5.94	250	1000
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ ²⁻ -E (P.NO.4 190-191) Turbidimetric method	mg/L	1.00	200	400
19.	Fluoride as F	APHA 22 nd edition 4500-F D. (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.82	1	1.50
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.15	45	No relaxation
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	5	200	600
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	3.00	-	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	-	-

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S. no.	Parameters	Protocol	Unit	Results April, '17	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
Trace metals						
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.30	No relaxation
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.008	0.02	No relaxation
26.	Manganese as	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.014	0.10	0.30
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.011	0.05	1.50
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.109	5	15
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.01	No relaxation
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10	No relaxation
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.021	0.05	No relaxation
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	0.03	0.20
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.001	No relaxation

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S. no.	Parameters	Protocol	Unit	Results	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
Microbiological						
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample	
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample	


Note : ND-Not detected, BDL : Below detectable limit.

INFERENCE:


As per IS : 10500 Standards (for drinking water) Report Status :-
All parameters confirm to the standard for drinking water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt. Analyst

2.  (G. Dhavaleshwar)
Govt. Analyst

VERIFIED BY:

 (P. Harika)
Environmental Officer

 (M. Shashikala)
HEAD OF THE LABORATORY

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COSMO CONSCIOUS RESEARCH LABORATORY

An Environmental Laboratory Recognized by MOEF (03.01.2014 to 02.01.2019)
and an ISO 9001:2008 & OSHAS 18001:2007 Certified (Nov-2017)

CCRI/F/02/00

WATER QUALITY MONITORING DATA (GROUND WATER)

Report no: II C

1. Name of the Project : Barga Iron Ore Mine
2. Name of the Client : M/s. Societade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Well in Sawikar Property (Sr.No. 175/2)
5. Particulars of sample collected : Well water
6. Sample code : BRGW3
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Drinking water specification Standards as per IS:10500:2012	
				Results April.'17	Desirable Limits Permissible Limits
PHYSICAL					
1.	Colour	IS: 3025 (PART 14)- 1984, RA-2012 Platinum cobalt Method	Hazen units	Under range	5 15
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	30.90	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	48	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	35	500 2000
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	6.98	6.5 to 8.5 No relaxation
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	0.10	1 5
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	1	-

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S. no.	Parameters	Protocol	Unit	Results April '17	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
CHEMICAL						
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	5.80	-	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	<1	-	-
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	4	-	-
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.023	-	-
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	4.60	-	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	2.00	-	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	3.21	75	200
15.	Magnesium as Mg	APHA 22 nd Edission 350-B-Mg By calculation	mg/L	4.37	30	100
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	26	200	600
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	10.89	250	1000
18.	Sulphate as SO ₄	APHA 22 nd edission 4500-SO ₄ ²⁻ -E (P.NO.4-190- 191) Turbidimetric method	mg/L	1.50	200	400
19.	Fluoride as F	APHA 22 nd edission 4500-F-D. (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.77	1	1.50
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.20	45	No relaxation
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	20	200	600
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	4.00	-	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	-	-

Contd.

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CCRI/E/02/00

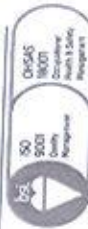
S. no.	Parameters	Protocol	Unit	Results		Drinking water specification Standards as per IS:10500:2012	
				April '17		Desirable Limits	Permissible Limits
Trace metals							
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.221	0.30	No relaxation	
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.009	0.02	No relaxation	
26.	Manganese as	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.158	0.10	0.30	
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.064	0.05	1.50	
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.023	5	15	
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.01	No relaxation	
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10	No relaxation	
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.032	0.05	No relaxation	
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	0.03	0.20	
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.001	No relaxation	

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CCRL/E/02/00


S. no.	Parameters	Protocol	Unit	Results	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
Microbiological						
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample	
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample	

Note : ND-Not detected, BDL : Below detectable limit.

INFERENCE: As per IS :10500 Standards (for drinking water) Report Status :-
All parameters confirm to the standard for drinking water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt.Analyst

2.  (G. Dhavaleshwar)
Govt.Analyst

 (P. Harika)
Environmental Officer

 (M. Shashikala)
HEAD OF THE LABORATORY

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COSMO CONSCIOUS RESEARCH LABORATORY

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and an ISO 9001:2008 & OSHAS 18001:2007 Certified (Nov-2017)

WATER QUALITY MONITORING DATA (GROUND WATER)

CCRL/F/02/00

Report no: II D

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Well in Baburao Property
5. Particulars of sample collected : Well water
6. Sample code : BRGW4
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Drinking water specification Standards as per IS:10500:2012	
				Results April, '17	Desirable Limits Permissible Limits
PHYSICAL					
1.	Colour	IS: 3025 (PART 14)-1984, RA-2012 Platinum cobalt Method	Hazen units	Under range	5 15
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	32.40	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	34	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	21	500 2000
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	7.21	6.5 to 8.5
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	4.00	1 5
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	4	-

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COSMO CONSCIOUS RESEARCH LABORATORY

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CCRI/F/02/00

S. no.	Parameters	Protocol	Unit	Results April '17	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
CHEMICAL						
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	6.10	-	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	<1	-	-
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	4	-	-
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.023	-	-
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.60	-	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.30	-	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	0.80	75	200
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	1.46	30	100
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	8	200	600
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	4.45	250	1000
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ -E (P.NO.4- 190-191) Turbidimetric method	mg/L	1.75	200	400
19.	Fluoride as F	APHA 22 nd edition 4500-F-D, (P.NO. 4-87 - 88) SPADNS Method	mg/L	0.72	1	1.50
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.10	45	No relaxation
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	10	200	600
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	3.00	-	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	-	-

Contd.

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COSMO CONSCIOUS RESEARCH LABORATORY

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and an ISO 9001:2008 & OSHAS 18001:2007 Certified (Nov-2017)

CCRL/E/02/00

S. no.	Parameters	Protocol	Unit	Results		Drinking water specification Standards as per IS:10500:2012	
				April '17		Desirable Limits	Permissible Limits
Trace metals							
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.137		0.30	No relaxation
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.007		0.02	No relaxation
26.	Manganese as	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.092		0.10	0.30
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL		0.05	1.50
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.103		5	15
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL		0.01	No relaxation
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL		0.10	No relaxation
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.024		0.05	No relaxation
32.	Aluminium as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL		0.03	0.20
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL		0.001	No relaxation

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COSMO CONSCIOUS RESEARCH LABORATORY

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CCRI/F/02/00


S. no.	Parameters	Protocol	Unit	Results	Drinking water specification Standards as per IS:10500:2012	
					Desirable Limits	Permissible Limits
Microbiological						
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample	-
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	Shall not be detectable in any 100 ml sample	-


Note : ND-Not detected, BDL : Below detectable limit.

INFERENCE: As per IS : 10500 Standards (for drinking water) Report Status :-
All parameters confirm to the standard for drinking water.

ANALYZED BY:

1.  (K. Somasekhhar Rao)
Govt. Analyst

2.  (G. Dhavaleshwar)
Govt. Analyst

 (P. Harika)
Environmental Officer

 (M. Sreshikala)
HEAD OF THE LABORATORY



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COSMO CONSCIOUS RESEARCH LABORATORY
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CCRI/F/02/00

WATER QUALITY MONITORING DATA
(SURFACE WATER)

Report no: II E

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Kushavathi River upstream
5. Particulars of sample collected : River
6. Sample code : BRSW1
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
PHYSICAL					
1.	Colour	IS: 3025 (PART 14)-1984, RA-2012 Platinum cobalt Method	Hozen units	Under range	-
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	31.40	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	86	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	64	-
5.	PH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	7.00	5.50 to 9.0
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	1.20	-
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	8	100

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COSMO CONSCIOUS RESEARCH LABORATORY

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CCRI/F/02/00

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
CHEMICAL					
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	5.70	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	1.60	30
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	8	250
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.010	5
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.90	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.80	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	7.21	-
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	7.28	-
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	48	-
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	5.44	-
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ -E (P.NO.4- 190-191) Turbidimetric method	mg/L	1.50	-
19.	Fluoride as F	APHA 22 nd edition 4500-F D. (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.69	2
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.30	10
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	45	-
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	4.00	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	10

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CCRI/F/02/00

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
Trace metals					
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.144	3
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.092	3
26.	Manganese as Mn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.160	2
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.010	3
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.051	5
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	-
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.101	2
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	-
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.01

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CCRI/F/02/00

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
Microbiological					
34.	Total Coliform count	APHA 22 nd Edition 9222-8 (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	-
35.	Escherichia coli count	APHA 22 nd Edition 9222-8 (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	-
Sample collected by COSMO CONSCIOUS RESEARCH LABORATORY					

Note: ND-Not detected, BDL: Below detectable limit.


INFERENCE:

As per Schedule VI Standards (for Inland surface waters) Report Status:-

All parameters confirm to the standard for surface water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt. Analyst

 (P. Harika)
Environmental Officer

2.  (G. Dhavaleshwar)
Govt. Analyst

 (M. Shashikala)
HEAD OF THE LABORATORY



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COSMO CONSCIOUS RESEARCH LABORATORY

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and an ISO 9001:2008 & OSHAS 18001:2007 Certified (Nov-2017)

CCRI/F/02/00

Report no: IIF

WATER QUALITY MONITORING DATA (SURFACE WATER)

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Kushavathi River Down stream
5. Particulars of sample collected : River
6. Sample code : BRSW2
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
PHYSICAL					
1.	Colour	IS: 3025 (PART 14)-1984, RA-2012 Platinum cobalt Method	Hazen units	Under range	-
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	31.90	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	104	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	74	-
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	6.36	5.50 to 9.0
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	1.00	-
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	1	100

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S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
CHEMICAL					
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	6.00	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	1.80	30
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	8	250
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.018	5
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.70	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.50	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	14.43	-
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	6.31	-
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	62	-
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	5.44	-
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ -E (P.NO.4- 190-191) Turbidimetric method	mg/L	1.00	-
19.	Fluoride as F	APHA 22 nd edition 4500-F-D (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.64	2
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.25	10
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	55	-
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	3.00	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	10

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S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
Trace metals					
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.041	3
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.063	3
26.	Manganese as Mn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.087	2
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	3
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.062	5
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	-
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.164	2
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	-
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.01

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S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	General Standards for Inland Surface water Schedule-VI (EPA-'86)
Microbiological					
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	-
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	-
Sample collected by					
COSMO CONSCIOUS RESEARCH LABORATORY					


Note: ND-Not detected, BDL: Below detectable limit.

INFERENCE:


As per Schedule VI Standards (for Inland surface waters) Report Status:-

All parameters confirm to the standard for surface water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt. Analyst

VERIFIED BY:  (P. Harika)
Environmental Officer

2.  (G. Dhavalleshwar)
Govt. Analyst

(M. Shashikala)
HEAD OF THE LABORATORY

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"SURVEY HOUSE", #121, 2nd Cross, Nehru Colony, Ballari-583103 (Karnataka), Ph: 08392 255744.
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WATER QUALITY MONITORING DATA
 (SURFACE WATER)

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Societade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Upstream of Nallah in 34 lease
5. Particulars of sample collected : Nallah
6. Sample code : BRSW5
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
PHYSICAL					
1.	Colour	IS: 3025 (PART 14)-1984, RA-2012 Platinum cobalt Method	Hazen units	1	-
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	31.40	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	36	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	26	-
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	7.25	5.50 to 9.0
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, . RA-2012 Nephelometric method	NTU	1.90	-
7.	Total Suspended Solids	IS:3025 (part 17)-1984, . RA-2012 Gravimetric Method	mg/L	9	100

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S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
CHEMICAL					
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	5.80	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	1.70	30
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	8	250
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.020	5
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.70	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	1.10	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	0.80	-
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	2.43	-
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	12	-
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	5.44	-
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ -E (P.NO.4- 190-191) Turbidimetric method	mg/L	1.50	-
19.	Fluoride as F	APHA 22 nd edition 4500-F-D. (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.78	2
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.65	10
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	10	-
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	3.00	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	10

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S. no.	Parameters	Protocol	Unit	Results	Standard
				April, '17	General Standards for Inland Surfacewater Schedule-VI (EPA-'86)
Trace metals					
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.386	3
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.081	3
26.	Manganese as Mn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.971	2
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	3
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.773	5
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	-
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.189	2
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	-
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.01

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S. no.	Parameters	Protocol	Unit	Results		Standard
				April '17		
Microbiological						
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND		General Standards for Inland Surfacewater Schedule- VI(EPA-'86)
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND		
Sample collected by						
COSMO CONSCIOUS RESEARCH LABORATORY						


Note: ND-Not detected, BDL: Below detectable limit.


INFERENCE:

As per Schedule VI Standards (for Inland surface waters) Report Status:-
All parameters confirm to the standard for surface water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt.Analyst

2.  (G. Dhavaleshwar)
Govt.Analyst

VERIFIED BY:  (P. Harika)
Environmental Officer

(M. Shashikala)
HEAD OF THE LABORATORY





COSMO CONSCIOUS RESEARCH LABORATORY

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CCRL/F/02/00

WATER QUALITY MONITORING DATA (SURFACE WATER)

Report no: II H

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Downstream of Nallah in 34 lease
5. Particulars of sample collected : Nallah
6. Sample code : BRSW6
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results		Standard
				April '17	General Standards for Inland Surface water Schedule-VI (EPA-'86)	
PHYSICAL						
1.	Colour	IS: 3025 (PART 14)-1984, RA-2012 Platinum cobalt Method	Hazen units	Under range	-	-
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	29.80	-	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	49	-	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	35	-	-
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	6.89	5.50 to 9.0	-
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, RA-2012 Nephelometric method	NTU	14.60	-	-
7.	Total Suspended Solids	IS:3025 (part 17)-1984, RA-2012 Gravimetric Method	mg/L	22	100	-

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S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	General Standards for Inland Surface water Schedule-VI (EPA-'86)
CHEMICAL					
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	6.00	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	2.00	30
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	8	250
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.020	5
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	3.50	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.90	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	0.80	-
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	2.91	-
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA Titrimetric method	mg/L	14	-
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	6.43	-
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ -E (P.NO.4-190-191) Turbidimetric method	mg/L	1.50	-
19.	Fluoride as F	APHA 22 nd edition 4500-F-D (P.NO. 4-87 - 88)SPADNS Method	mg/L	0.60	2
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.25	10
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 indicator method	mg/L	15	-
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	4.00	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	10

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S. no.	Parameters	Protocol	Unit	Results		Standard
				April '17	General Standards for Inland Surface water Schedule-VI (EPA-'86)	
Trace metals						
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.210	0.210	3
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.110	0.110	3
26.	Manganese as Mn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.339	0.339	2
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	BDL	3
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	BDL	5
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	BDL	0.10
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	BDL	-
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.189	0.189	2
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	BDL	-
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	BDL	0.01

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S. no.	Parameters	Protocol	Unit	Results		Standard
				April '17		
Microbiological						
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND		General Standards for Inland Surface water Schedule-VI (EPA-'86)
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND		
Sample collected by COSMO CONSCIOUS RESEARCH LABORATORY						


Note: ND-Not detected, BDL: Below detectable limit.


INFERENCE:

As per Schedule VI Standards (for Inland surface waters) Report Status:-
All parameters confirm to the standard for surface water.

ANALYZED BY:

1. 
(K. Somasekhar Rao)
Govt. Analyst

2. 
(G. Dhavdeshwar)
Govt. Analyst


VERIFIED BY: (P. Harika)
Environmental Officer


(M. Shashikala)
HEAD OF THE LABORATORY





COSMO CONSCIOUS RESEARCH LABORATORY

An Environmental Laboratory Recognized by MOEF (03.01.2014 to 02.01.2019)
and an ISO 9001:2008 & OSHAS 18001:2007 Certified (Nov-2017)

CCRI/F/02/00

WATER QUALITY MONITORING DATA (SURFACE WATER)

Report no: II I

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Sample collected by : Cosmo Conscious Research Laboratory
4. Name of the Location : Spring water near Sateri Temple
5. Particulars of sample collected : Nallah
6. Sample code : BRSW7
7. Date of collection : 26.04.2017.
8. Date of Received : 27.04.2017.

S. no.	Parameters	Protocol	Unit	Results April, '17	Standard
PHYSICAL					
1.	Colour	IS: 3025 (PART 14)-1984, RA-2012 Platinum cobalt Method	Hazen. units	Under range	-
2.	Ambient Temperature	IS:3025 (PART 9)-1984, RA-2012 Thermometer	°C	29.60	-
3.	Conductivity	IS:3025 (PART 14)-1984, RA-2013 Electrometric method	µs/cms	28	-
4.	Total Dissolved Solids	IS:3025 (part 16)-1984, RA-2012 Gravimetric method	mg/L	20	-
5.	pH	IS:3025 (part 11)-1983, RA-2012 Electrometric method	-	6.87	5.50 to 9.0
6.	Turbidity (NTU)	IS:3025 (part 10)-1984, . RA-2012 Nephelometric method	NTU	6.80	-
7.	Total Suspended Solids	IS:3025 (part 17)-1984, . RA-2012 Gravimetric Method	mg/L	2	100

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CCRL/E/02/00

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	General Standards for Inland Surface water Schedule-VI (EPA-'86)
CHEMICAL					
8.	Dissolved Oxygen	IS:3025 (part 38)-1989, RA-2014 Winkler titrimetric azide modification	mg/L	6.30	-
9.	Biochemical Oxygen Demand for 3 days at 27 °C	IS:3025 (part 44)-1993, RA-2014 Three days BOD at 27°C	mg/L	1.20	30
10.	Chemical Oxygen Demand	APHA 5220-B (P.NO. 5-17) Open reflux method	mg/L	8	250
11.	Phosphorous as P	IS:3025 (part 31)-1988, RA-2014 Stannous chloride method	mg/L	0.018	5
12.	Sodium as Na	IS:3025 (part 45)-1993, RA-2014 Flame Emission photometric method	mg/L	2.90	-
13.	Potassium as K	IS:3025 (part 17)-1984, RA-2014 Flame Emission photometric method	mg/L	0.10	-
14.	Calcium as Ca	IS:3025 (part 40)-1991, RA-2014 EDTA Titrimetric method	mg/L	0.80	-
15.	Magnesium as Mg	APHA 22 nd Edition 350-B-Mg By calculation	mg/L	1.46	-
16.	Total Hardness as CaCO ₃	IS:3025 (part 21)-1983, RA-2014 EDTA titrimetric method	mg/L	8	-
17.	Chloride as Cl	IS:3025 (part 32)-1988, RA-2014 Argentometric Method	mg/L	6.93	-
18.	Sulphate as SO ₄	APHA 22 nd edition 4500-SO ₄ -E (P.NO.4-190-191) Turbidimetric method	mg/L	2.75	-
19.	Fluoride as F	APHA 22 nd edition 4500-F D. (P.NO. 4-87-88) SPADNS Method	mg/L	0.70	2
20.	Nitrate Nitrogen as NO ₃	IS:3025 (part 34)-1988, RA-2014 Chromotropic acid method	mg/L	0.20	10
21.	Total Alkalinity as CaCO ₃	IS:3025 (part 23)-1986, RA-2014 Indicator method	mg/L	5	-
22.	Acidity as CaCO ₃	IS:3025 (part 22)-1986, RA-2014 Indicator method	mg/L	3.00	-
23.	Oil & Grease	IS:3025 (part 39)-1991, RA-2014 Partition Gravimetric method	mg/L	BDL	10

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CCRL/F/02/00

S. no.	Parameters	Protocol	Unit	Results	Standard
				April '17	
Trace metals					
24.	Total Iron as Fe	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.104	3
25.	Nickel as Ni	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.102	3
26.	Manganese as Mn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.011	2
27.	Copper as Cu	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	3
28.	Zinc as Zn	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	0.020	5
29.	Lead as Pb	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	0.10
30.	Silver as Ag	APHA 22 nd Edition 3111 B. (p.no.3-19) Direct Air Acetylene Flame Method	mg/L	BDL	-
31.	Chromium as Cr	APHA 22 nd Edition 3111 B. (p.no.3-18) Direct Air Acetylene Flame Method	mg/L	0.243	2
32.	Aluminum as Al	APHA 22 nd Edition 3111 D. (p.no.3-21) Direct Nitrous Oxide- Acetylene Flame Method	mg/L	BDL	-
33.	Mercury as Hg	APHA 22 nd Edition 3112 B. (p.no.3-23) Direct Air Acetylene e Flame Method	mg/L	BDL	0.01

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CCRI/F/02/00

S. no.	Parameters	Protocol	Unit	Results	Standard
Microbiological					
34.	Total Coliform count	APHA 22 nd Edition 9222-B (p.no.9-66-67) Membrane filter technique	MPN/100 ml	ND	General Standards for Inland Surface water Schedule-VI (EPA-'86)
35.	Escherichia coli count	APHA 22 nd Edition 9222-B (p.no.9-76) Membrane filter technique	MPN/100 ml	ND	
Sample collected by COSMO CONSCIOUS RESEARCH LABORATORY					


Note: ND-Not detected, BDL: Below detectable limit.


INFERENCE:

As per Schedule VI Standards (for Inland surface waters) Report Status:-
All parameters confirm to the standard for surface water.

ANALYZED BY:

1.  (K. Somasekhar Rao)
Govt. Analyst

2.  (G. Dhavaleshwar)
Govt. Analyst

 (P. Hafika)
Environmental Officer

 (M. Shashikala)
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CCRL/F/02/00

Report no: II J

WATER QUALITY MONITORING DATA (SURFACE WATER)

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Date of visit for sample collection : 26.04.2017.

Sl.no	Sample Code	Location Name	Location details	Remarks
1.	BRSW1	Upstream of Nallah in 29 lease	Nallah	Dried-up
2.	BRSW2	Downstream of Nallah in 29 lease	Nallah	Dried-up


(K. Somasekhar Rao)
Govt. Analyst



(M. Shashikala)

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CCRI/E/02/00


WATER QUALITY MONITORING DATA
(Open wells depths)

Report no: II K

1. Name of the Project : Borga Iron Ore Mine
2. Name of the Client : M/s. Sociedade Timblo Irmaos Limitada
3. Date of visit for sample collection : 26.04.2017.

Sl.no	Sample Code	Location Name	Open Wells depths(in meters)	
			April 2017	
1.	BRGW1	Well in PII Property within the lease area (Sr.No. 73)	4.90	
2.	BRGW2	Well in Proveen Desai Property (Sr.No. 79/111)	2.64	
3.	BRGW3	Well in Sawikar Property (Sr.No. 175/2)	7.20	
4.	BRGW4	Well in Baburoo Property	2.90	

Measured BY:


(K. Somasekhar Rao)
Govt. Analyst


VERIFIED BY: (P. Harika)
Environmental Officer


(M. Shashikala)
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