

ENVIRONMENTAL QUALITY MONITORING REPORT

MONSOON

2018

DHANGARWADI BAUXITE MINE

**DHANGARWADI VILLAGE,
SAHUWADI TALUK,**

**KOLHAPUR DISTRICT,
MAHARASHTRA**

AWI IN 2956834

M/S HINDALCO INDUSTRIES LIMITED

PREPARED BY

BHAGAVATHIANA LABS PVT LTD.,

7-2-C-14, Industrial Estate,
Sanathnagar, Hyderabad
500 018

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PREFACE

Environmental quality monitoring at **Dhangarwadi bauxite mine** situated at Dhangarwadi village, Shahuwadi taluka, Kolhapur, Maharashtra of **M/S. Hindalco Industries Limited** entrusted to **Bhagavathi Ana Labs Pvt. Limited, Hyderabad** during monsoon season of the year 2018.

The monitoring was carried out in the selected locations in core zone and buffer zone around the mine lease area. Accordingly, ground and surface water samples were collected during the month of June 2018

Bhagavathi Ana Labs Pvt. Limited, Hyderabad gratefully acknowledges the cooperation extended by management and staff of M/S Hindalco Industries Limited and the village people to their field staff.



EXECUTIVE SUMMARY

Dhangarwadi Bauxite Mine of M/S Hindalco Industries Limited includes the study of the water quality only in core zone and buffer zone around the mine lease area during the monsoon season of the year 2018.

WATER QUALITY MONITORING

Water quality monitoring consists of the study of surface and ground water sources and its quality in the core and buffer zone of the lease area. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Water samples were collected from selected locations during study period and analyzed in the laboratory as per the standard IS & APHA procedures.

INDEX MAP



DHANGARWADI BAUXITE MINE
M/s Hindalco Industries Limited

NOT TO SCALE

AREA DETAILS

INTRODUCTION

Hindalco Industries is one of the leading producers of aluminum in the country. The company business involves bauxite mining to alumina refining. Alumina metal conversion, sheet, extrusion, foil manufacturing and is spread all over the country. The company is operating number of bauxite mines in Maharashtra, Orissa, Chhattisgarh and Jharkhand to feed the Alumina Plants located in Belgaum, Renukut and Muri.

On getting concurrence from Central Government, Government of Maharashtra has indicated its intention to grant mining lease over of 122.63 ha, out of which 41.80 ha falls under non forest area. As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 122.63 ha and the same was approved by the Indian Bureau of Mines vide letter no. MP/KLP/MAH-73-SZ, DT.11/11/2003. On submission of approved mining plan Government of Maharashtra has sanctioned mining lease for the production of bauxite for the revenue land of 41.80 and keeping pending of sanction of mining lease for the forest land of 80.83 ha subject to obtaining "No Objection certificate" from the Ministry of Environment and Forest, Govt. of India. The Environmental Clearance was obtained for the production of 0.6 million TPA of bauxite over an entire area of 122.63 ha.

Considering the delay in the process of forest clearance for the area falling under forest land, the Government of Maharashtra has granted mining lease only for the non forest land of 41.80 ha. by keeping pending the grant of mining lease for the forest area. Accordingly, the mining lease was executed by the collector of Kolhapur over an area 41.80 ha. on 05/05/2008 for period of 30 years.

MINE DETAIL

Dhangarwadi bauxite mine is located near Dhangarwadi village of Shahuwadi taluka of Kolhapur District in Maharashtra state.

GEOGRAPHICAL DETAILS:

Latitude : 16° 52' to 16° 56'
Longitude : 73° 48' to 73° 51'

Details of lease area

The following table gives the details of the area in terms of district, taluka, village, gat no., etc.

District	Taluka	Village	Gat No.	Area granted (ha)	Owner/Occupier.
Kolhapur	Shahuwadi	Dhangarwadi			
"	"	"	45	12.32	Private land
"	"	"	46(part)	6.53	Private land
"	"	"	50(part)	2.17	Private land
"	"	"	52	10.58	Private land
"	"	"	53(part)	5.09	Private land
Kolhapur	Shahuwadi	Ainwadi	56(part)	2.76	Private land
			106(part)	2.35	Private land
				41.80	

ACCESSIBILITY

The district headquarter Kolhapur is connected to Mumbai by broad gauge railway line of South Central Railway of Indian Railway. Daily trains services are available from Mumbai and many other important places to Kolhapur. The nearest (i) railway station is Kolhapur at a distance of 56 kms eastwards with respect to the mines. The district is well served by a network of good roads - National Highways, State Highways and Major District roads. The National Highway Mumbai - Pune- Bangalore passes through Kolhapur.

Road

Dhangarwadi is approachable by a distance of 8 kms from Dhopeswar Junction, located 6 kms from Malkapur Town on Ratnagiri - Nagpur National Highway.

Rail head

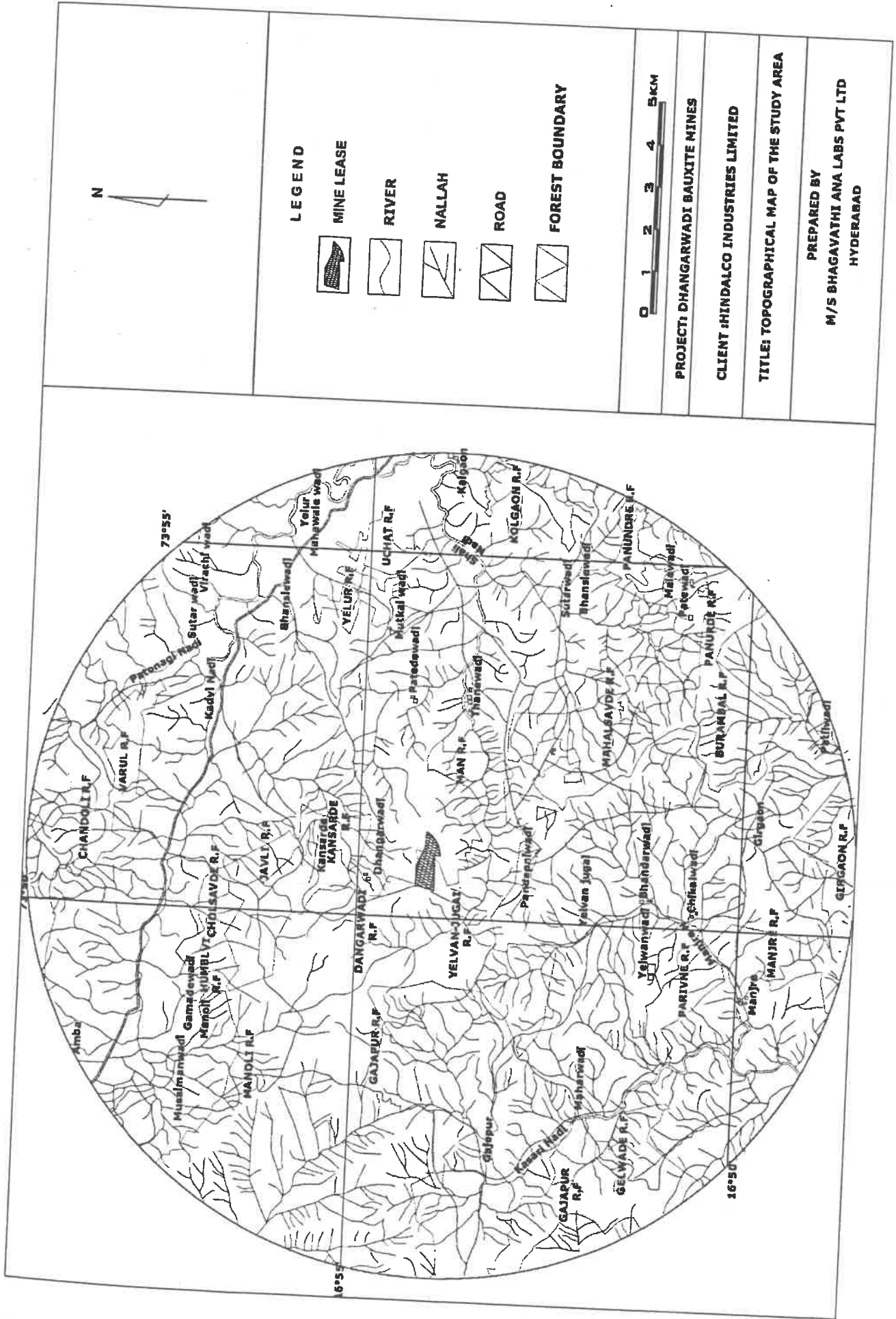
The nearest railway head is Kolhapur which is situated at a distance of about 56 kms by road from the lease area.

Sea Port






The nearest sea port is Ratnagiri sea port is about 95 kms from the mine

Airport

The nearest airport is at Kolhapur which is around 60 kms by road from the lease area.



LEGEND

-  MINE LEASE
-  RIVER
-  NALLAH
-  ROAD
-  FOREST BOUNDARY



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT: HINDALCO INDUSTRIES LIMITED

TITLE: TOPOGRAPHICAL MAP OF THE STUDY AREA

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HYDERABAD**

**DHANGARWADI BAUXITE MINE
(M/s. Hindalco Industries Limited)**

DETAILS

State	Maharashtra
District	Kolhapur
Taluka	Shahuwadi
Village	Dhangarwadi
Latitude	16° 52' to 16° 56'
Longitude	73° 48' to 73° 51'
Nature of the area	Plateau terrain
Topposheet no.	47 H/13.

GENERAL CLIMATIC CONDITIONS

Maximum temperature	40.0 °C
Minimum temperature	16.0° C

ACCESSIBILITY

Road connectivity	Approached by road connecting to Dhopeswar Junction which is at a distance of 8 kms, located 6 kms from Malkapur Town on Ratnagiri-Nagpur National Highway (NH-4).
Rail connectivity	Kolhapur railway station (56km)
Airport	Kolhapur(60km)
Biosphere reserve	Not any
Sanctuary	Chandoli wild life sanctuary is situated at about 50 kms .

ENVIRONMENTAL DETAILS

Environmental quality monitoring at **Dhangarwadi Bauxite Mine** of **M/S Hindalco Industries Limited** at Dhangarwadi village of Shahuwadi taluka, Kolhapur district, Maharashtra, includes monitoring of water quality within core zone and buffer zone around the mine lease area.

WATER QUALITY

Water quality monitoring consists of the study of water sources and its quality in the core and buffer zone of the lease area. Following two important systems of water bodies:

- ▣ Surface water quality.
- ▣ Ground water quality.

▣ Surface water quality

Tamrapani and Ghataprabha River are the surface water source in the study area. There are others seasonal nallah which flows in the study area. Proper drainage system has prepared to drag the monsoon water into the mine pit so as to reduce the water pollution. Buffer zone has many seasonal nallah and spring which used to recharge the ground during summer.

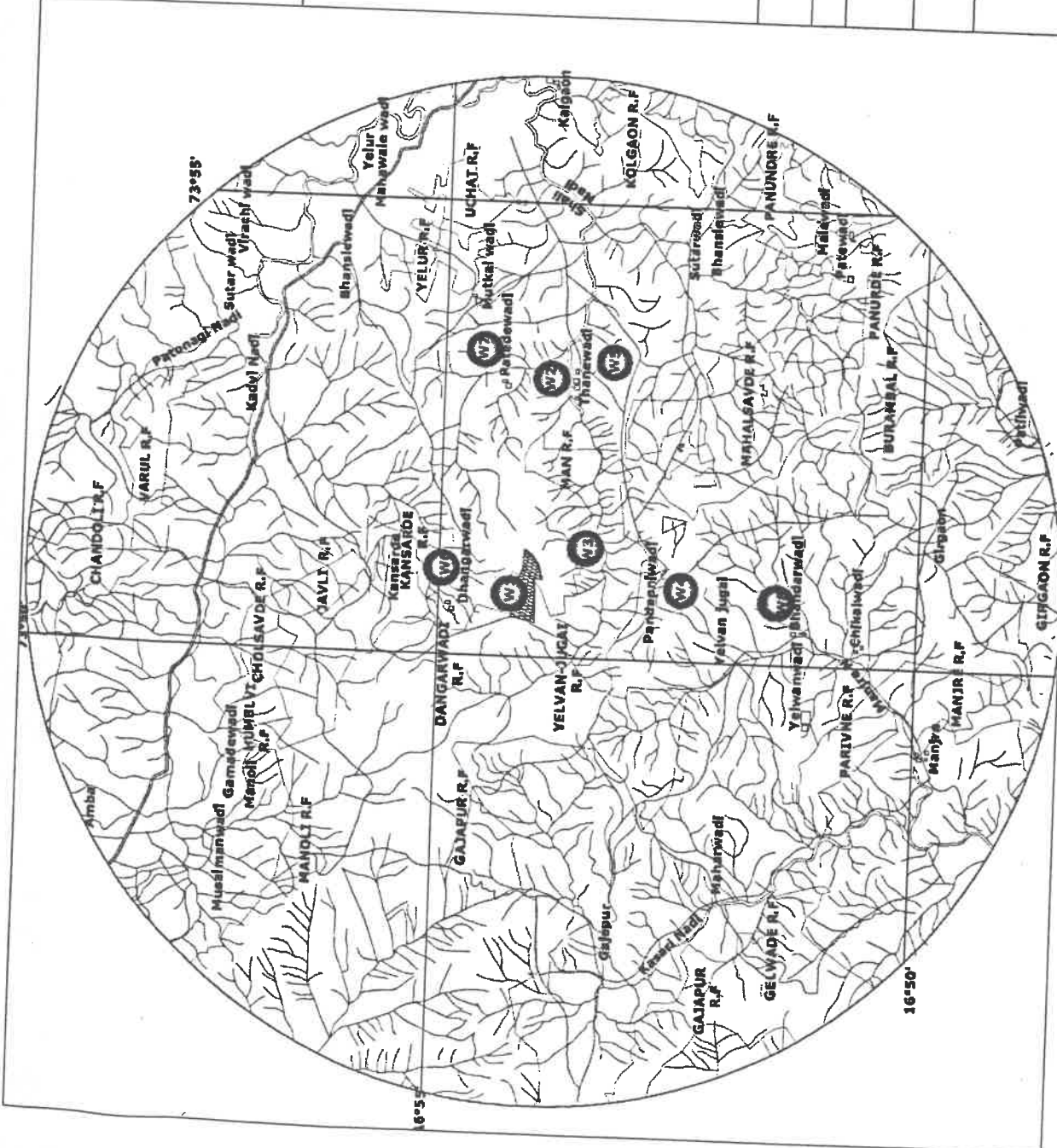
▣ Ground water quality

The most important source of drinking water in the study area is the ground water, which is tapped by a bore well. The buffer zone is good in ground water source. The ground water in the study area gets recharged by rainwater during summer.







Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). A total of 8 locations have selected, out of which one in core zone and seven are in buffer zone. Location of water quality monitoring stations is given below.

WATER QUALITY MONITORING LOCATIONS

Code	Name of sampling station	Source of water
W - 1	Mine pit water	Surface water
W - 2	Shali nadi (up stream)	Surface water
W - 3	Shali nadi (down stream)	Surface water
W - 4	Pandapniwadi village	Ground water
W - 5	Thanewadi village	Ground water
W - 6	Dhangarwadi village	Ground water
W - 7	Patewadi village	Ground water
W - 8	Bhandarwadi village	Ground water



LEGEND

-  MINE LEASE
-  RIVER
-  NALLAH
-  ROAD
-  FOREST BOUNDARY
-  WATER SAMPLING LOCATION



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT: HINDALCO INDUSTRIES LIMITED

TITLE: WATER SAMPLING LOCATIONS MAP

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HYDERABAD

SAMPLING DETAILS

The water samples were collected from selected sampling locations, which are coming under core zone and buffer zone around the mine lease area. Samples were collected in the monsoon season of the year 2018 as per the prescribed sample collecting methods and analyzed as per the IS standard procedures. Complete analysis report of water samples are given below.

SURFACE WATER QUALITY

Date of Sampling: 20.06.2018

Sl. No	Parameter	Units	W-1 MINE PIT WATER	W-2 SHALI NADI UP STREAM	W-3 SHALI NADI DOWN STREAM
1	Odour	--	Un- objectionable	Un- objectionable	Un- objectionable
2	Taste	--	Agreeable	Agreeable	Agreeable
3	Color	Hazen units	<5	<5	<5
4	pH	--	6.50	6.53	6.61
5	Turbidity	NTU	<5	<5	<5
6	Dissolved Oxygen	mg/l	6.0	7.00	7.10
7	Total Dissolved solids	mg/l	69	118	60
8	Total Suspended solids	mg/l	47	47	50
9	Alkalinity as CaCO ₃	mg/l	20.0	30.0	16
10	Total Hardness as CaCO ₃	mg/l	44.0	62.0	40.0
11	Nitrate as NO ₃	mg/l	0.15	0.14	0.11
12	Phosphates as PO ₄	mg/l	0.25	0.26	0.27
13	Chlorides as Cl	mg/l	20.3	27	17
14	Sulphates as SO ₄	mg/l	4	12	4.25
15	Sodium as Na	mg/l	3	5.6	2.4
16	Potassium as K	mg/l	1.6	3.1	1.1
17	Calcium as Ca	mg/l	8	8.8	11.2
18	Magnesium as Mg	mg/l	5.7	4.8	2.8
19	Lead as Pb	mg/l	BDL	BDL	BDL
20	Manganese as Mn	mg/l	0.03	0.03	0.03
21	Cadmium as Cd	mg/l	BDL	BDL	BDL
22	Chromium as Cr	mg/l	BDL	BDL	BDL
23	Copper as Cu	mg/l	BDL	BDL	BDL
24	Zinc as Zn	mg/l	BDL	BDL	BDL
25	Iron as Fe	mg/l	0.10	0.60	0.07
26	Fluoride as F	mg/l	BDL	BDL	BDL
27	Mercury as Hg	mg/l	BDL	BDL	BDL
28	Selenium as Se	mg/l	BDL	BDL	BDL
29	Arsenic as As	mg/l	BDL	BDL	BDL
30	Cyanide as CN	mg/l	BDL	BDL	BDL
31	Boron as B	mg/l	BDL	BDL	BDL
32	B.O.D	mg/l	3	4	5

BDL: Below Detectable Limit

mg/l: Milligram per liter

GROUND WATER QUALITY

Date of Sampling: 20.06.2018

Sl. No	Parameter	Units	W-4 PANDAPNIWAD I VILLAGE	W - 5 THANEWADI VILLAGE	W - 6 DHANGARWAD I VILLAGE	W-7 PATEWADI VILLAGE	W-8 BHANDAR WADI VILLAGE
1	Odour	--	Un- objectiona ble	Un- objectionabl e	Un- objectiona ble	Un- objectionabl e	Un- objectiona ble
2	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Color	Hazen units	<5	<5	<5	<5	<5
4	pH	--	6.79	6.77	6.80	6.59	6.70
5	Turbidity	NTU	<5	<5	<5	<5	<5
6	Dissolved Oxygen	mg/l	4.50	5.00	5.20	4.59	4.66
7	Total Dissolved solids	mg/l	85	74	30	80	106
8	Total Suspended solids	mg/l	13	11	9	11	15
9	Alkalinity as CaCO ₃	mg/l	37	20	10	40	57
10	Total Hardness as CaCO ₃	mg/l	48.0	46.0	29.0	48.0	41.0
11	Nitrate as NO ₃	mg/l	0.069	0.088	0.1	0.69	0.95
12	Phosphates as PO ₄	mg/l	0.21	0.22	0.21	0.45	0.27
13	Chlorides as Cl	mg/l	14	15.47	16.44	15.47	15.47
14	Sulphates as SO ₄	mg/l	2.23	5.85	8.61	10.21	0.85
15	Sodium as Na	mg/l	3	7	1.6	5	13
16	Potassium as K	mg/l	1	4	1	2.7	8
17	Calcium as Ca	mg/l	8.8	8.8	8	8.8	8
18	Magnesium as Mg	mg/l	5.28	7.21	4.8	1.92	4.81
19	Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL
20	Manganese as Mn	mg/l	0.02	0.02	0.02	0.06	0.07
21	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL
22	Chromium as Cr	mg/l	BDL	BDL	BDL	BDL	BDL
23	Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL
24	Zinc as Zn	mg/l	BDL	BDL	BDL	BDL	BDL
25	Iron as Fe	mg/l	0.08	0.08	0.10	0.09	0.06
26	Fluoride as F	mg/l	BDL	BDL	BDL	BDL	BDL
27	Mercury as Hg	mg/l	BDL	BDL	BDL	BDL	BDL
28	Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL
29	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL
30	Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL
31	Boron as B	mg/l	BDL	BDL	BDL	BDL	BDL
32	B.O.D	mg/l	3	3	4	3	4

BDL: Below Detectable Limit

mg/l: Milligram per liter

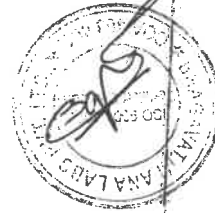
NOTE: The results relate only to the condition prevailing at the time of sampling

RESULTS & DISCUSSION

- ❑ The pH of the study area varies from 6.50 to 6.80 in the study area. The permissible range of pH is 6.5 to 8.5.
- ❑ Dissolved Oxygen content of the study area has been found to be in the range of 4.50 to 7.10.
- ❑ Total Dissolved Solids found to be in the range of 30 to 118 mg/l in the water sample collected in study area. As per IS 10500 standard for drinking water, the desirable limit is 500 mg/l and maximum permissible limit is 2000 mg/l.
- ❑ Alkalinity as CaCO_3 is found to be in the range of 29 to 62.0 in the water sample collected in study area. As per IS 10500 standard for drinking water, the desirable limit is 200 mg/l and maximum permissible limit is 600 mg/l.
- ❑ Total hardness as CaCO_3 of the water sample collected in the study area is found to in the range of 13 to 69 mg/l. As per IS 10500 standard for drinking water, the desirable limit is 300 mg/l and maximum permissible limit is 600 mg/l.
- ❑ Chloride of the water sample collected in the study area is found to in the range of 14 to 27 mg/l. As per IS 10500 standard for drinking water, the desirable limit is 250 mg/l and maximum permissible limit is 1000 mg/l.
- ❑ Calcium content of the water in the study area found to be in the range of 8.0 to 11.20 mg/l. As per IS 10500 standard for drinking water, the desirable limit 75 mg/l and maximum permissible limit is 200 mg/l.
- ❑ Magnesium content of the water in the study area found to be in the range of 1.92 to 7.21 mg/l.
- ❑ Iron content of the water in the study area found to be in the range of 0.06 to 0.11 mg/l. As per IS 10500 standard for drinking water, the desirable limit 0.3 mg/l and maximum permissible limit is 1.0 mg/l.

DOMESTIC EFFLUENT ANALYSISSample Type: **Canteen waste water**Date of sampling: **20.06.2018**

Sl.No	Test	Result
1	Total Suspended Solids, mg/l	89
2	Total Dissolved Solids, mg/l	97
3	COD, mg/l	11
4	BOD for 3 days at 27°C, mg/l	5
5	Total Solids	60
6	Oil and Grease, mg/l	<5



**DRINKING WATER STANDARDS
AS PER IS: 10500**

Sl.no	Parameter	Unit	Desirable limit as per is: 10500	Maximum permissible limit as per is: 10500
1	Odour		Un-objectionable	
2	Taste		Agreeable	
3	Colour	Hazen Units	5	25
4	pH		6.5 - 8.5	
5	Turbidity	NTU	5	10
6	Dissolved Oxygen	mg /l	-----	
7	Total Dissolved Solids	mg /l	500	2000
8	Alkalinity as CaCO ₃	mg /l	200	600
9	Total hardness as CaCO ₃	mg /l	300	600
10	Nitrates NO ₃	mg /l	45	100
11	Phosphates PO ₄	mg /l	-----	
12	Chlorides as Cl	mg /l	250	1000
13	Sulphates, SO ₄ ²⁻	mg /l	200	400
14	Sodium as Na	mg /l	-----	
15	Potassium as K	mg /l	-----	
16	Calcium as Ca	mg /l	75	200
17	Magnesium, Mg	mg /l	30	100
18	Lead (Pb)	mg /l	0.05	0.05
19	Manganese	mg /l	0.1	0.3
20	Cadmium (Cd)	mg /l	0.01	0.01
21	Chromium (Cr)	mg /l	0.05	0.05
22	Copper (Cu)	mg /l	0.05	1.5
23	Zinc (Zn)	mg /l	5	15
24	Iron as Fe	mg /l	0.3	1.0
25	Fluoride as F	mg /l	1	1.5
26	Mercury as Hg	mg /l	0.001	0.001
27	Selenium as se	mg /l	0.01	0.01
28	Arsenic as As	mg /l	0.05	0.05
29	Cyanide as CN	mg/l	0.05	0.05
30	Boron as B	mg/l	1	5

DHANGARWADI MINES

WELL DEPTHS OF VILLAGES

S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
				20.06.2018
1	PANDAPNIWADI VILLAGE	DHANGARWADI	6.00	4.0
2	DHANGARWADI VILLAGE	DHANGARWADI	6.00	5.0