DHANGARWADI
BAUXITE MINE

TAHSIL: SHAHUWADI, DISTRICT: KOLHAPUR,
STATE: MAHARASHTRA

OF

M/s HINDALCO INDUSTRIES LTD.

ENVIRONMENTAL QUALITY MONITORING REPORT

SEASON - POST MONSOON 2019

SEPTEMBER, OCTOBER, NOVEMBER

PREPARED BY

EQUINOX™
Equinox Environments (India) Pvt. Ltd.

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An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION

2019 - 2020

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PREFACE

M/s. Hindalco Industries Limited entrusted environmental quality monitoring at **Dhangarwadi Bauxite Mine** situated in Dhangarwadi village, Shahuwadi Tahsil, Kolhapur District, Maharashtra to **Equinox Environments (India) Pvt. Ltd.** during post monsoon season of the year 2019.

According to MoU dt. 1st September 2018, The **Equinox Environments (India) Pvt. Ltd.** has availed the various monitoring services by lab viz. **Green Envirosafe Engineers & Consultant Pvt. Ltd.** which is recognized and duly approved by the **Ministry of Environment, Forests & Climate Change (MoEFCC); New Delhi** (through Notification No. S.O. 1174 (E) dated 18.07.2007 as amended vide Notification No. S.O. 388 (E) dated 10.02.2017) and NABL (ISO/IEC 17025:2005 vide certificate number TC-8061 dated 03.11.2018) has also received certifications namely ISO 9001:2015 and OHSAS 18001: 2007 from Crescent Quality Certification Pvt. Ltd.

The environmental monitoring for water quality was carried out in core zone and buffer zone during the months of September–October–November 2019. The data obtained was complied to assess the current environmental status of the mining as well as the surrounding villages in the study area for following environmental parameters.

- Micro-meteorology
- Ambient air quality
- Ambient noise level quality
- Water quality
- Soil Quality
- DG set Stack monitoring

The data obtained was complied to assess the current environmental status of the mining as well as the surrounding villages in the study area.

Equinox Environments India Pvt. Ltd. gratefully acknowledges the cooperation extended by management and staff of M/s. Hindalco Industries Limited and village people to the field staff.

EXECUTIVE SUMMARY

Dhangarwadi Bauxite Mine of M/s. Hindalco Industries Limited includes the study of the ambient air quality, noise level quality, water quality and soil quality in core zone and buffer zone in and around the mine lease area during the post monsoon season of the year 2019

AMBIENT AIR QUALITY

The scenario of the existing ambient air quality in the study region has been assessed through a network of selected ambient air quality locations. Pre-calibrated respirable dust and fine particulate sampler has been used for AAQ monitoring. Maximum, minimum, average and percentile values have been computed from the data collected at all individual sampling stations to represent the ambient air quality status.

AMBIENT NOISE LEVEL MONITORING

Mining and allied activities usually cause noise pollution. Excessive noise levels cause adverse effects on human beings and associated environment including domestic animals, wild life, natural ecosystem and structures. To know the ambient noise levels in the study area, noise levels were recorded at mining area and nearby villages using noise level meter.

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.

SOIL QUALITY MONITORING

The normal mineral composition of plants is affected by alteration in soil conditions. Organic remains accumulate mainly on the surface of the soil. Soils that have low stability of structure disperse and slake when they are wetted by rains or water from irrigation and may develop a hard crust as the soil surface dries. This crust presents a serious barrier for emerging seedlings. With some crops often it is the main cause for poor growth. In the present study, soil samples were collected from the identified locations and analyzed in the laboratory.

MICROMETEOROLOGY

Meteorological scenario helps to understand the trends of the climatic factors. It also helps in the identification of sampling stations in the study area meteorological scenario experts a critical influence on air quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions.

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 to 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.

As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 41. 80 ha and the same was approved by the Indian Bureau of Mines vide letter no. MP/KLP/MAH-73-SZ, DT.11/11/2003on submission of approved mining plan Government of Maharashtra has sanctioned mining lease for the production of bauxite in the revenue land and The Environmental Clearance was obtained for the production of 0.6 million TPA of bauxite over the entire area. The mining lease was executed by the collector of Kolhapur over the area on 05/05/2008 and the lease expires on 04/05/2038.

MINE DETAIL

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

GEOGRAPHICAL DETAILS

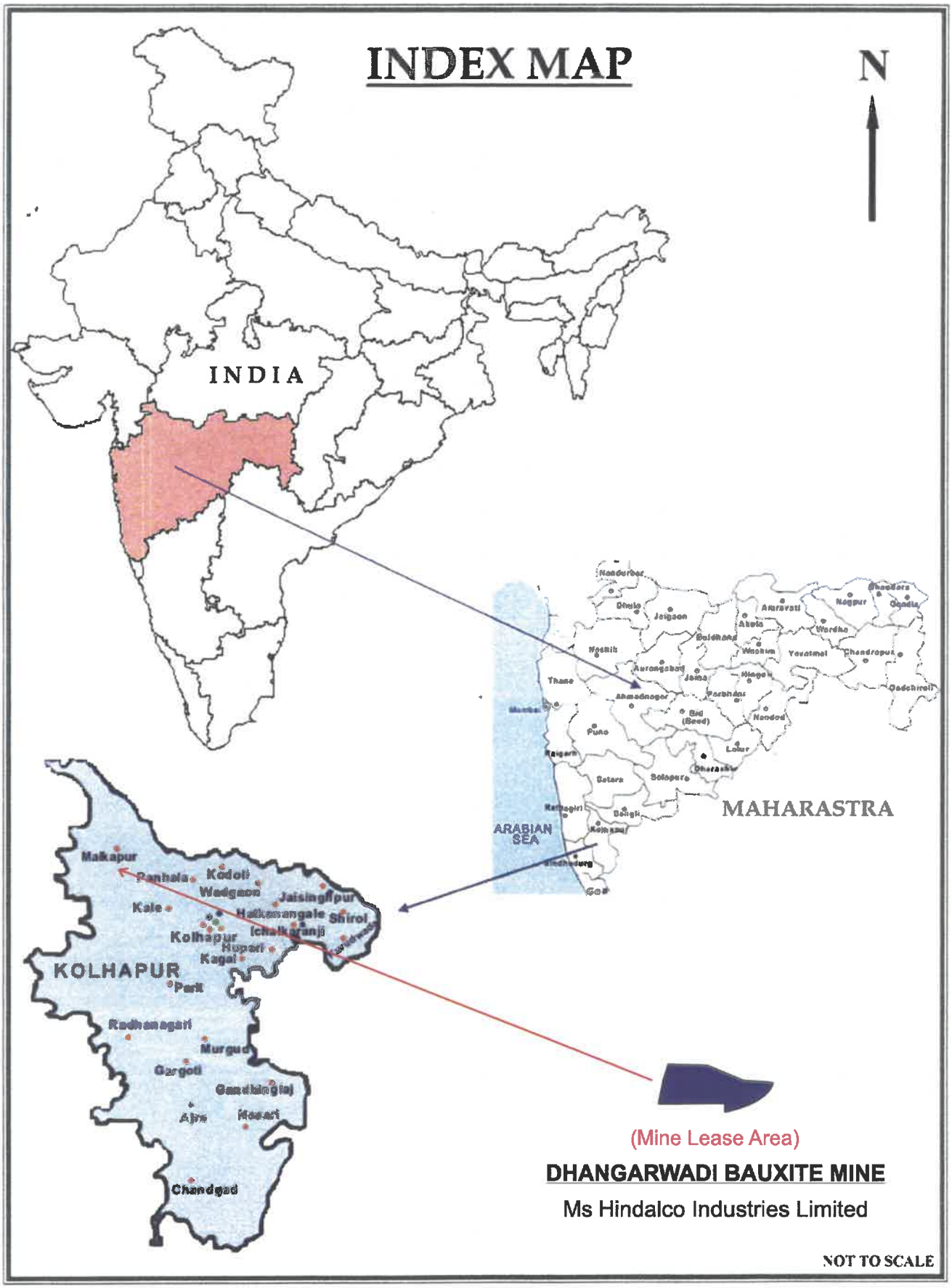
Latitude:	16.0°54.0'0.0"
Longitude:	73.0°49.0'5.0"
MSL:	1020 m

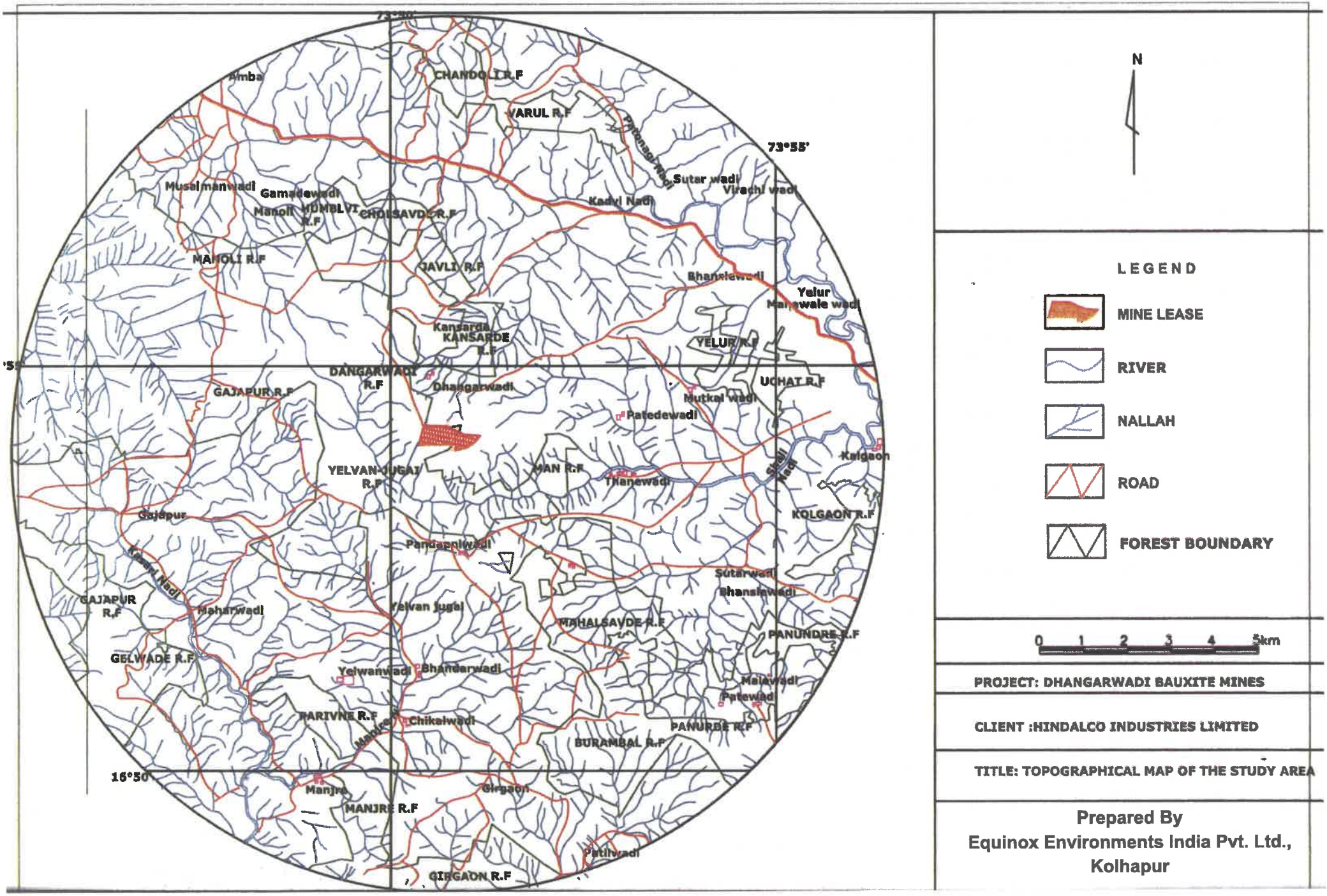
DETAILS OF LEASE AREA

The following table gives the details of the area in terms of District, Tahsil, Village, Gat no. and Area granted in hectors.

District	Tahsil	Village	Gat No.	Area Granted (ha)
Kolhapur	Shahuwadi	Dhangarwadi	45	12.32
			46 (p)	6.53
			50(p)	2.17
			52	10.58
			53(p)	5.09
			56(p)	2.76
		Ainwadi	106(p)	2.35
			Total	**41.80**

DHANGARWADI BAUXITE MINE (M/s. Hindalco Industries Limited)	
DETAILS	
State	Maharashtra
District	Kolhapur
Tahsil	Shahuwadi
Village	Dhangarwadi
Latitude	16°54'0.0"
Longitude	73°49'5.0"
Nature of the area	Plateau terrain
Toposheet no.	47 H/13.
GENERAL CLIMATIC CONDITIONS	
Maximum temperature	40.0° C
Minimum temperature	16.0° C
ACCESSIBILITY	
Road connectivity	Approached by road connecting Dhopeshwar Junction which is at a distance of 8 kms, located 6 kms from Malkapur Town on Ratnagiri-Nagpur National Highway (NH-204).
Rail connectivity	Kolhapur railway station (56 km)
Airport	Kolhapur (60 km)
Sea Port	Ratnagiri (95 km)
Biosphere reserve	Not any
Sanctuary	Chandoli wild life sanctuary is situated at about 20 kms.


INDEX MAP
N
INDIA
MAHARASTRA
ARABIAN SEA
KOLHAPUR
Malkapur
Panhala
Kodoli
Wadgaon
Jaisingpur
Kale
Hatkanangale
Shirol
Kolhapur
Ichalkaranji
Hupari
Kagal
Patil
Radhanagari
Murgud
Gargoti
Gandhinglaj
Ajra
Kesari
Chandgad
(Mine Lease Area)
DHANGARWADI BAUXITE MINE
Ms Hindalco Industries Limited
NOT TO SCALE



N

LEGEND

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

0 1 2 3 4 5km

PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE: TOPOGRAPHICAL MAP OF THE STUDY AREA

Prepared By
Equinox Environments India Pvt. Ltd.,
Kolhapur

MICRO-METEOROLOGY

Meteorological data within the project area during the air quality survey period was assessed.

PRIMARY / BASIC METEOROLOGICAL PARAMETERS

- Wind Speed (Km/h)
- Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors these factors are considered as primary meteorological parameters.

SECONDARY METEOROLOGICAL PARAMETERS

- Ambient Temperature
- Humidity

Meteorological Data September - 2019							
Date	Temperature		AVERAGE Humidity	Wind Speed Km/h			Wind Direction
	MIN	MAX		MIN	MAX	AVERAGE	
02.09.2019	17	29	82	0	9	4.5	West
03.09.2019	17	31	83	0	10	5.0	West
09.09.2019	18	29	82	0	12	5.5	West
10.09.2019	18	32	95	0	8	3.5	West
16.09.2019	17	30	93	0	13	5.5	West
17.09.2019	18	31	87	0	11	4.5	West
23.09.2019	17	30	92	0	10	4.0	West
24.09.2019	18	31	90	0	9	3.5	West

Meteorological Data October - 2019							
Date	Temperature		AVERAGE Humidity	Wind Speed Km/h			Wind Direction
	MIN	MAX		MIN	MAX	AVERAGE	
07.10.2019	18	33	76	0	9	4.5	West
08.10.2019	20	31	78	0	10	5.0	West
14.10.2019	18	33	83	0	10	4.5	West
15.10.2019	19	32	76	0	12	4.5	West
21.10.2019	20	32	85	0	13	6.0	West
22.10.2019	17	33	83	0	11	5.5	West
28.10.2019	17	32	79	0	12	5.5	West
29.10.2019	20	33	83	0	9	4.5	West

Meteorological Data November - 2019							
Date	Temperature		AVERAGE Humidity	Wind Speed Km/h			Wind Direction
	MIN	MAX		MIN	MAX	AVERAGE	
04.11.2019	16	32	69	0	8	4.0	East
05.11.2019	18	33	68	0	11	3.5	East
11.11.2019	17	35	72	0	12	6.0	East
12.11.2019	18	33	63	0	11	5.5	East
18.11.2019	18	35	68	0	9	4.0	East
19.11.2019	19	34	60	0	11	5.0	East
25.11.2019	17	35	58	0	8	3.5	East
26.11.2019	17	34	59	0	12	5.5	East

ENVIRONMENTAL QUALITY

Environmental quality monitoring at Dhangarwadi Bauxite Mine of M/s.Hindalco Industries Limited at Dhangarwadi village of Shahuwadi Tahsil, Kolhapur district, Maharashtra includes monitoring of various environmental components like air, noise and soil water quality status within core zone and buffer zone in and around the mine lease area.

AMBIENT AIR QUALITY

The main aim of the ambient air quality monitoring within core zone and buffer zone was to assess the environmental condition and to know the existing levels of the air pollution in the project area. Air pollution forms an important and critical factor to study the environmental issues in the mining areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to mining and allied activities. Ambient air quality monitoring stations were set up at eight selected locations, 4 in core zone and 4 in buffer zone.

SELECTION OF SAMPLING LOCATIONS

The status of the ambient air quality has been assessed through ambient air quality-monitoring network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions on synoptic scale
- Topography of the study area
- Representatives of regional background air quality for obtaining

Ambient air quality monitoring stations were set up at eight locations, 4 in core zone and 4 in buffer zone with due considerations to the above mentioned points.

INSTRUMENT USED FOR SAMPLING

Ambient Fine Dust Sampler was used for monitoring particulate matter (PM_{10}), particulate matter ($PM_{2.5}$) and other gaseous pllutants.

Sr. No.	Instrument Name	Ambient Fine Dust Sampler
1.	**Model No.**	IPM-FDS-M 2.5µ/10µ Fine Dust Sampler
2.	**Serial No.**	FDSM/2018-19/368-1
3.	**Calibration Details**	From 02/08/2019 To 02/07/2020
4.	**Calibration Certificate No.**	IPM-FDS/18-19/368-1

METHOD FOR TESTING PM_{10}/ $PM_{2.5}$

Sr. No.	Content	Details
1.	Name of Pollutant	PM_{10}/ $PM_{2.5}$
2.	Medium	Air
3.	Instrument	Respirable Dust Sampler / Fine Particulate Sampler
4.	Duration	24 hourly
5.	Mode	Continuous
6.	Unit	µg/m^3
7.	Method	Gravimetric

METHOD FOR TESTING

Sr. No.	Name of Pollutant	Sulphur Dioxide	Oxides of Nitrogen	Carbon monoxide
1.	**Method**	Modified West & Geake Method	Modified Jacob & Hochheiser Modified (Na-Arsenite) Method	NDIR Method
2.	**Frequency**	24 hourly	24 hourly	24 hourly
3.	**Mode**	Continuous	Continuous	Continuous
4.	**Unit**	µg/m^3	µg/m^3	mg/m^3
5.	**Procedure**	AS Per IS 5182 (Part II)	AS Per IS 5182 (Part IV)	NDIR Method

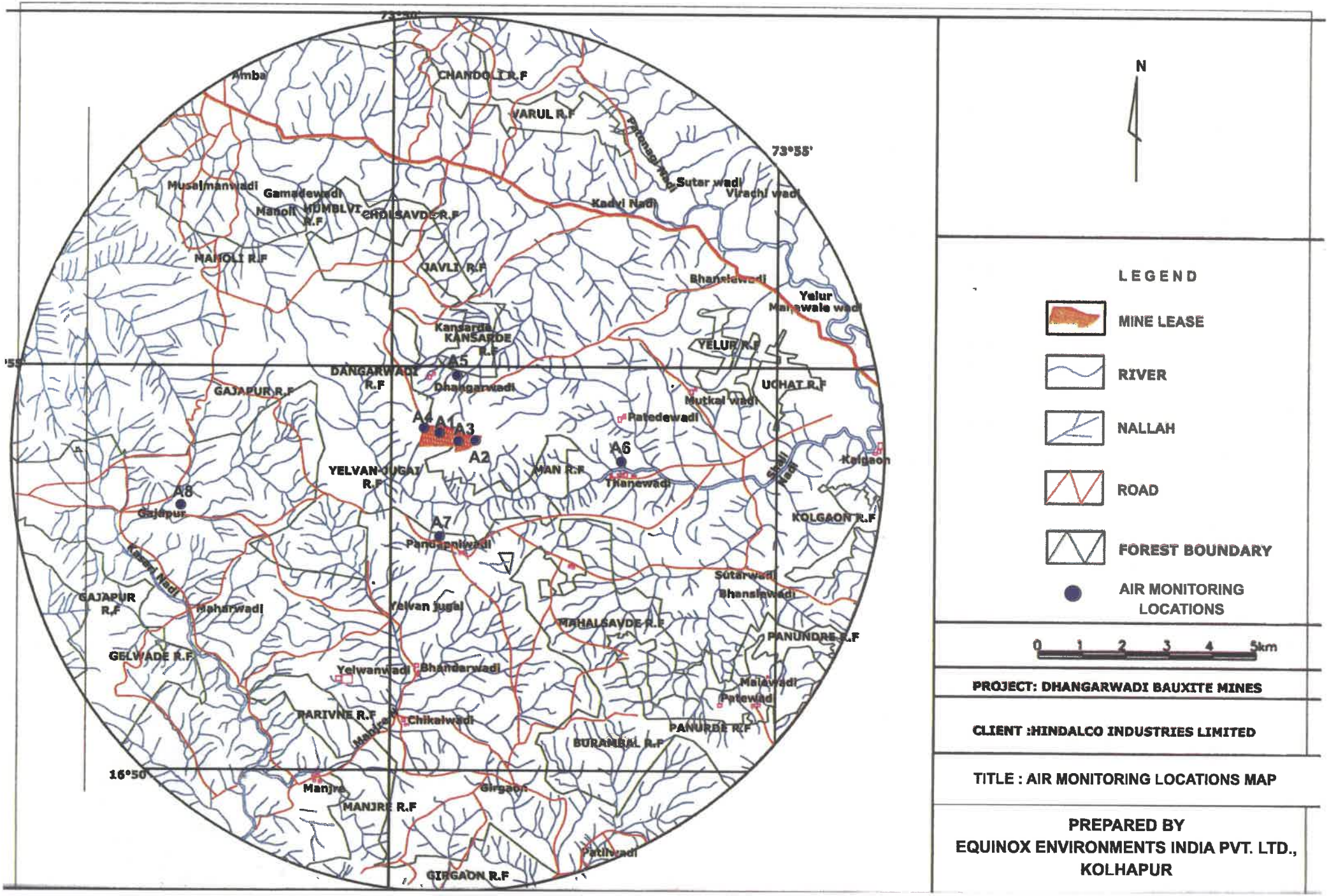
Monitoring Location Details

Respirable dust sampler and Fine particulate sampler were placed at a height of 3m above the ground level in above mentioned monitoring locations. These stations were selected so as to assess present pollution level due to mining and allied activities. The observed levels of PM_{10}, $PM_{2.5}$, $S0_2$, NOx, CO and HC collected during post

monsoon season of the year 2019 are presented in annexure and are summarized in the following table.

AMBIENT AIR QUALITY MONITORING STATION

Sl. No.	Station Code	Name Of The Sampling Station	Direction W.R.T. Mines Lease Area
1	A-1	Near Mine Working Area	- - -
2	A-2	Near Dump Site	- - -
3	A-3	Near Haulage Road	- - -
4	A-4	Near Mines Office /DG Set	- - -
5	A-5	Dhangarwadi Village	N
6	A-6	Thanewadi Village	ESW
7	A-7	Pandapniwadi Village	S
8	A-8	Gajapur Village	WSW



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE : AIR MONITORING LOCATIONS MAP

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR

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Engineers & Consultant Pvt Ltd.
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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/221-244	Date of Report	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-1

NAME OF LOCATION- Station: A1, Near Mine Working Area

Sampling Date	Date of Sample Registration	Parameter	PM10 µg/m3	PM2-5 µg/m3	SO2 µg/m3	NOX µg/m3	CO mg/m3	Hydro-Carbon
		Limit	100 (µg/m3)	60 (µg/m3)	80 (µg/m3)	80 (µg/m3)	04 (mg/m3)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method	GC Method
September – 2019								
02.09.2019	06.09.2019	Week-1	49.2	16.3	8.2	11.5	0.07	0.03
03.09.2019	06.09.2019	Week-1	53.5	17.1	9.8	14.5	0.08	0.02
09.09.2019	13.09.2019	Week-2	52.4	20.0	10.5	12.8	0.06	0.04
10.09.2019	13.09.2019	Week-2	56.7	16.1	8.8	15.6	0.07	0.02
16.09.2019	20.09.2019	Week-3	50.7	18.6	10.3	17.2	0.08	0.05
17.09.2019	20.09.2019	Week-3	53.7	15.7	10.2	16.4	0.09	0.03
23.09.2019	27.09.2019	Week-4	51.4	19.1	11.2	17.8	0.07	0.04
24.09.2019	27.09.2019	Week-4	50.9	17.8	9.9	13.9	0.06	0.05
October – 2019								
07.10.2019	11.10.2019	Week-2	50.2	18.2	7.1	14.0	0.07	0.05
08.10.2019	11.10.2019	Week-2	51.4	16.8	8.7	18.3	0.06	0.03
14.10.2019	18.10.2019	Week-3	54.7	16.1	8.8	12.8	0.06	0.06
15.10.2019	18.10.2019	Week-3	53.5	15.9	10.5	15.1	0.07	0.05
21.10.2019	25.10.2019	Week-4	51.2	18.5	9.8	15.4	0.05	0.03
22.10.2019	25.10.2019	Week-4	57.2	17.4	9.0	13.7	0.08	0.05
28.10.2019	01.11.2019	Week-5	58.9	18.5	8.5	12.6	0.04	0.03
29.10.2019	01.11.2019	Week-5	56.6	19.0	7.7	13.3	0.07	0.04
November – 2019								
04.11.2019	08.11.2019	Week-1	50.6	16.7	10.8	16.8	0.07	0.03
05.11.2019	08.11.2019	Week-1	54.3	15.9	11.4	17.5	0.06	0.05
11.11.2019	15.11.2019	Week-2	58.2	17.8	13.3	16.4	0.08	0.04
12.11.2019	15.11.2019	Week-2	48.7	19.1	11.7	18.9	0.06	0.02
18.11.2019	22.11.2019	Week-3	53.8	18.4	14.5	19.7	0.07	0.06
19.11.2019	22.11.2019	Week-3	52.5	20.1	12.6	16.1	0.06	0.04
25.11.2019	29.11.2019	Week-4	51.2	18.6	12.7	16.6	0.07	0.05
26.11.2019	29.11.2019	Week-4	52.1	17.5	13.1	17.3	0.08	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Air Quality Monitoring Report

Report No-	**GESEC/PRO/2019-20/12/245-269**	**Date of Report**	**10/12/2019**
Name of Client	**Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra**		
Project Name & Address	**M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra**		
Sample Collected and Analyzed by	**Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-**		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-2

NAME OF LOCATION- Station: A2, Near Dump Site

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_x µg/m^3	CO mg/m^3	Hydro-Carbon
		Limit	100 (µg/m^3)	60 (µg/m^3)	80 (µg/m^3)	80 (µg/m^3)	04 (mg/m^3)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
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16.09.2019	20.09.2019	Week-3	49.5	14.6	12.2	18.6	0.07	0.03
17.09.2019	20.09.2019	Week-3	50.2	17.8	15.1	18.7	0.07	0.04
23.09.2019	27.09.2019	Week-4	54.8	16.4	12.0	17.9	0.06	0.04
24.09.2019	27.09.2019	Week-4	50.5	18.5	13.5	18.0	0.05	0.06
October – 2019								
07.10.2019	11.10.2019	Week-2	49.1	16.8	13.1	16.8	0.06	0.05
08.10.2019	11.10.2019	Week-2	51.5	17.6	11.7	14.1	0.05	0.04
14.10.2019	18.10.2019	Week-3	53.2	15.8	12.5	16.6	0.06	0.04
15.10.2019	18.10.2019	Week-3	51.1	18.1	14.1	17.5	0.08	0.05
21.10.2019	25.10.2019	Week-4	49.5	17.5	12.9	18.7	0.07	0.06
22.10.2019	25.10.2019	Week-4	48.6	15.5	15.2	18.5	0.08	0.05
28.10.2019	01.11.2019	Week-5	50.3	16.4	13.3	17.9	0.09	0.05
29.10.2019	01.11.2019	Week-5	50.0	17.7	12.7	16.4	0.05	0.04
November – 2019								
04.11.2019	08.11.2019	Week-1	50.3	16.6	12.5	17.6	0.06	0.05
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11.11.2019	15.11.2019	Week-2	51.2	15.8	11.7	16.8	0.05	0.04
12.11.2019	15.11.2019	Week-2	50.3	18.6	13.3	18.8	0.08	0.06
18.11.2019	22.11.2019	Week-3	48.6	20.1	12.8	17.6	0.06	0.05
19.11.2019	22.11.2019	Week-3	49.3	16.8	11.3	18.4	0.05	0.03
25.11.2019	29.11.2019	Week-4	51.1	18.6	14.2	19.0	0.08	0.06
26.11.2019	29.11.2019	Week-4	53.4	19.4	13.1	17.5	0.07	0.05

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/270-293	Date of Report	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-1

NAME OF LOCATION- Station: A3, Near Haulage Road

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
September – 2019								
02.09.2019	06.09.2019	Week-1	48.8	16.7	11.7	16.5	0.07	0.05
03.09.2019	06.09.2019	Week-1	55.2	18.4	12.4	15.4	0.05	0.04
09.09.2019	13.09.2019	Week-2	53.5	15.8	14.1	18.1	0.08	0.02
10.09.2019	13.09.2019	Week-2	49.7	17.5	13.2	15.3	0.05	0.05
16.09.2019	20.09.2019	Week-3	52.3	18.6	11.5	16.5	0.06	0.05
17.09.2019	20.09.2019	Week-3	53.1	15.5	15.1	17.7	0.09	0.06
23.09.2019	27.09.2019	Week-4	50.5	17.1	11.9	18.8	0.06	0.04
24.09.2019	27.09.2019	Week-4	54.3	18.0	12.5	15.9	0.07	0.03
October – 2019								
07.10.2019	11.10.2019	Week-2	51.2	16.3	11.8	18.4	0.07	0.03
08.10.2019	11.10.2019	Week-2	49.8	18.4	13.2	15.8	0.07	0.05
14.10.2019	18.10.2019	Week-3	55.2	15.8	11.2	16.5	0.05	0.05
15.10.2019	18.10.2019	Week-3	49.1	16.5	12.3	17.9	0.08	0.02
21.10.2019	25.10.2019	Week-4	49.7	18.8	13.4	15.5	0.07	0.06
22.10.2019	25.10.2019	Week-4	51.5	15.7	14.0	16.2	0.06	0.04
28.10.2019	01.11.2019	Week-5	52.1	18.0	12.7	18.0	0.09	0.03
29.10.2019	01.11.2019	Week-5	53.7	17.5	13.6	17.4	0.08	0.03
November – 2019								
04.11.2019	08.11.2019	Week-1	52.1	16.3	13.5	16.6	0.07	0.03
05.11.2019	08.11.2019	Week-1	53.4	15.4	15.0	18.0	0.06	0.05
11.11.2019	15.11.2019	Week-2	54.2	18.8	12.6	16.2	0.05	0.04
12.11.2019	15.11.2019	Week-2	50.5	15.4	13.2	15.8	0.08	0.04
18.11.2019	22.11.2019	Week-3	51.4	16.8	14.3	15.5	0.07	0.06
19.11.2019	22.11.2019	Week-3	50.3	18.0	12.2	16.7	0.04	0.05
25.11.2019	29.11.2019	Week-4	49.8	16.8	11.4	18.4	0.06	0.04
26.11.2019	29.11.2019	Week-4	53.6	18.5	14.5	17.6	0.08	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

GREEN ENVIROSAFE
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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/294-317	Date of Report	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-2

NAME OF LOCATION- Station: A4, Near Mines Office /DG Set

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
September – 2019								
04.09.2019	07.09.2019	Week-1	53.4	16.2	13.2	15.6	0.08	0.05
05.09.2019	07.09.2019	Week-1	51.5	15.8	11.6	16.2	0.06	0.02
11.09.2019	14.09.2019	Week-2	52.2	18.5	13.6	18.0	0.06	0.04
12.09.2019	14.09.2019	Week-2	54.7	17.7	11.7	19.8	0.08	0.04
18.09.2019	21.09.2019	Week-3	49.9	15.3	14.1	15.7	0.05	0.06
19.09.2019	21.09.2019	Week-3	51.2	17.7	14.4	16.5	0.04	0.05
25.09.2019	28.09.2019	Week-4	53.3	15.5	12.2	17.3	0.07	0.04
26.09.2019	28.09.2019	Week-4	54.1	16.6	13.6	18.6	0.08	0.03
October – 2019								
09.10.2019	12.10.2019	Week-2	51.2	16.2	14.4	15.9	0.07	0.05
10.10.2019	12.10.2019	Week-2	53.5	17.6	12.6	17.5	0.08	0.06
16.10.2019	19.10.2019	Week-3	49.8	16.8	15.3	18.8	0.06	0.06
17.10.2019	19.10.2019	Week-3	51.2	15.6	11.1	16.7	0.06	0.04
23.10.2019	26.10.2019	Week-4	50.6	16.5	12.4	15.6	0.08	0.03
24.10.2019	26.10.2019	Week-4	53.2	17.4	13.5	16.5	0.05	0.04
30.10.2019	02.11.2019	Week-5	52.1	18.1	14.6	15.2	0.07	0.06
31.10.2019	02.11.2019	Week-5	49.5	15.8	15.6	16.4	0.08	0.05
November – 2019								
06.11.2019	09.11.2019	Week-1	53.4	16.5	11.0	16.2	0.06	0.05
07.11.2019	09.11.2019	Week-1	52.7	15.8	13.5	15.7	0.08	0.04
13.11.2019	16.11.2019	Week-2	50.3	17.6	15.1	17.6	0.06	0.05
14.11.2019	16.11.2019	Week-2	50.5	18.0	12.4	15.1	0.05	0.03
20.11.2019	23.11.2019	Week-3	51.9	16.7	13.4	16.5	0.05	0.04
21.11.2019	23.11.2019	Week-3	49.2	17.4	14.2	17.3	0.07	0.06
27.11.2019	30.11.2019	Week-4	49.8	16.9	12.6	18.1	0.08	0.04
28.11.2019	30.11.2019	Week-4	53.6	17.4	14.5	17.0	0.06	0.05

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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CIN No. : U74900PN2013PTC149666

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/318-341	**Date of Report**	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-1

NAME OF LOCATION- Station: A 5, Dhangarwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
September – 2019								
04.09.2019	07.09.2019	Week-1	42.8	12.4	10.5	12.1	0.05	0.03
05.09.2019	07.09.2019	Week-1	43.2	13.0	11.8	13.8	0.07	0.05
11.09.2019	14.09.2019	Week-2	41.8	11.8	09.4	14.7	0.04	0.04
12.09.2019	14.09.2019	Week-2	43.1	12.8	10.2	15.0	0.06	0.02
18.09.2019	21.09.2019	Week-3	44.2	13.3	09.4	11.6	0.05	0.05
19.09.2019	21.09.2019	Week-3	43.7	12.5	11.8	13.5	0.05	0.04
25.09.2019	28.09.2019	Week-4	42.5	11.6	08.6	11.4	0.07	0.03
26.09.2019	28.09.2019	Week-4	42.4	12.2	12.5	14.9	0.06	0.04
October – 2019								
09.10.2019	12.10.2019	Week-2	42.2	11.6	10.4	12.6	0.03	0.03
10.10.2019	12.10.2019	Week-2	41.8	12.4	10.3	14.7	0.05	0.01
16.10.2019	19.10.2019	Week-3	43.7	11.8	11.3	13.1	0.04	0.05
17.10.2019	19.10.2019	Week-3	41.4	13.4	09.5	11.8	0.02	0.04
23.10.2019	26.10.2019	Week-4	42.4	12.0	10.7	11.3	0.05	0.06
24.10.2019	26.10.2019	Week-4	44.2	11.5	11.0	13.5	0.03	0.02
30.10.2019	02.11.2019	Week-5	43.4	12.9	09.4	12.5	0.04	0.04
31.10.2019	02.11.2019	Week-5	42.2	13.7	11.5	13.3	0.03	0.02
November – 2019								
06.11.2019	09.11.2019	Week-1	42.7	12.6	09.6	13.8	0.04	0.03
07.11.2019	09.11.2019	Week-1	41.5	11.8	11.3	11.1	0.02	0.05
13.11.2019	16.11.2019	Week-2	43.3	13.1	10.5	10.5	0.03	0.02
14.11.2019	16.11.2019	Week-2	40.3	10.7	08.5	12.7	0.05	0.04
20.11.2019	23.11.2019	Week-3	41.5	11.6	11.1	13.5	0.03	0.03
21.11.2019	23.11.2019	Week-3	41.6	12.4	09.4	10.6	0.04	0.05
27.11.2019	30.11.2019	Week-4	42.8	11.5	08.6	12.9	0.05	0.04
28.11.2019	30.11.2019	Week-4	40.3	10.9	10.3	12.3	0.03	0.02

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/342-365	Date of Report	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-2

NAME OF LOCATION- Station: A6, Thanewadi Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
September – 2019								
04.09.2019	07.09.2019	Week-1	41.8	10.6	09.5	11.8	0.04	0.03
05.09.2019	07.09.2019	Week-1	45.1	12.8	11.2	13.1	0.02	0.04
11.09.2019	14.09.2019	Week-2	44.5	10.5	08.5	10.6	0.05	0.02
12.09.2019	14.09.2019	Week-2	43.1	13.4	10.1	12.4	0.03	0.03
18.09.2019	21.09.2019	Week-3	42.5	11.7	09.4	13.8	0.02	0.04
19.09.2019	21.09.2019	Week-3	41.6	12.6	11.1	15.5	0.04	0.02
25.09.2019	28.09.2019	Week-4	43.3	10.8	10.4	13.3	0.03	0.01
26.09.2019	28.09.2019	Week-4	44.6	13.0	09.6	12.7	0.03	0.03
October – 2019								
09.10.2019	12.10.2019	Week-2	43.4	13.1	09.3	11.8	0.04	0.03
10.10.2019	12.10.2019	Week-2	40.3	11.6	11.2	13.3	0.02	0.02
16.10.2019	19.10.2019	Week-3	41.5	10.7	09.4	14.4	0.05	0.04
17.10.2019	19.10.2019	Week-3	40.9	12.3	08.9	12.6	0.03	0.03
23.10.2019	26.10.2019	Week-4	41.8	13.0	10.4	14.1	0.05	0.02
24.10.2019	26.10.2019	Week-4	41.4	11.8	09.2	13.3	0.04	0.01
30.10.2019	02.11.2019	Week-5	42.5	10.5	11.3	16.5	0.03	0.02
31.10.2019	02.11.2019	Week-5	43.5	11.6	10.6	14.7	0.02	0.04
November – 2019								
06.11.2019	09.11.2019	Week-1	41.4	11.7	09.0	12.1	0.02	0.02
07.11.2019	09.11.2019	Week-1	42.2	10.9	11.2	13.5	0.05	0.04
13.11.2019	16.11.2019	Week-2	45.2	12.5	08.4	13.7	0.03	0.03
14.11.2019	16.11.2019	Week-2	43.6	11.8	11.0	14.9	0.02	0.05
20.11.2019	23.11.2019	Week-3	42.4	13.5	09.2	11.7	0.04	0.02
21.11.2019	23.11.2019	Week-3	41.5	14.4	08.4	12.8	0.03	0.03
27.11.2019	30.11.2019	Week-4	42.3	10.4	10.8	13.0	0.04	0.04
28.11.2019	30.11.2019	Week-4	41.9	12.1	09.5	13.6	0.03	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/366-413	Date of Report	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-1

NAME OF LOCATION- Station: A7, Pandapniwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_X µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
September – 2019								
06.09.2019	09.09.2019	Week-1	41.8	12.8	10.4	13.6	0.03	0.02
07.09.2019	09.09.2019	Week-1	43.1	10.6	09.1	12.3	0.02	0.05
13.09.2019	16.09.2019	Week-2	42.3	13.1	11.3	14.7	0.04	0.03
14.09.2019	16.09.2019	Week-2	41.6	11.5	09.5	13.1	0.02	0.02
20.09.2019	23.09.2019	Week-3	42.7	12.3	08.8	10.5	0.05	0.04
21.09.2019	23.09.2019	Week-3	43.8	12.5	10.0	13.4	0.03	0.02
27.09.2019	30.09.2019	Week-4	44.6	13.4	11.1	15.4	0.03	0.03
28.09.2019	30.09.2019	Week-4	42.1	10.4	08.5	13.2	0.04	0.04
October – 2019								
11.10.2019	14.10.2019	Week-2	41.4	13.2	10.4	14.2	0.03	0.02
12.10.2019	14.10.2019	Week-2	42.4	11.8	08.9	12.8	0.02	0.04
18.10.2019	21.10.2019	Week-3	44.0	12.4	11.5	14.6	0.04	0.03
19.10.2019	21.10.2019	Week-3	41.3	10.5	10.3	14.5	0.05	0.01
25.10.2019	28.10.2019	Week-4	42.1	12.7	09.8	13.5	0.02	0.03
26.10.2019	28.10.2019	Week-4	43.4	11.5	09.2	11.4	0.03	0.02
November – 2019								
01.11.2019	05.11.2019	Week-1	43.2	11.7	11.1	12.6	0.03	0.01
02.11.2019	05.11.2019	Week-1	41.4	13.8	08.3	12.4	0.05	0.03
08.11.2019	12.11.2019	Week-2	42.2	10.7	10.3	13.8	0.02	0.03
09.11.2019	12.11.2019	Week-2	42.2	14.1	11.6	15.5	0.04	0.04
15.11.2019	19.11.2019	Week-3	41.5	13.6	09.2	12.5	0.02	0.05
16.11.2019	19.11.2019	Week-3	43.1	10.8	10.4	13.7	0.03	0.02
22.11.2019	26.11.2019	Week-4	40.3	11.4	12.3	13.2	0.04	0.02
23.11.2019	26.11.2019	Week-4	42.5	13.9	10.4	13.3	0.05	0.03
29.11.2019	03.12.2019	Week-5	45.3	12.4	09.2	10.5	0.03	0.02
30.11.2019	03.12.2019	Week-5	43.8	11.3	08.7	11.2	0.04	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/414-437	**Date of Report**	10/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-2

NAME OF LOCATION- Station: A 8, Gajapur Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
September – 2019								
06.09.2019	09.09.2019	Week-1	41.7	11.6	09.3	12.5	0.04	0.03
07.09.2019	09.09.2019	Week-1	42.2	13.4	10.6	12.7	0.02	0.01
13.09.2019	16.09.2019	Week-2	41.3	10.5	09.5	13.4	0.03	0.04
14.09.2019	16.09.2019	Week-2	42.8	12.5	08.4	11.8	0.05	0.03
20.09.2019	23.09.2019	Week-3	43.5	11.6	11.1	14.4	0.02	0.02
21.09.2019	23.09.2019	Week-3	43.1	13.0	09.8	14.0	0.03	0.02
27.09.2019	30.09.2019	Week-4	42.1	14.1	11.3	15.3	0.04	0.03
28.09.2019	30.09.2019	Week-4	44.5	12.7	08.2	11.6	0.03	0.01
October – 2019								
11.10.2019	14.10.2019	Week-2	41.4	13.3	09.5	11.3	0.03	0.02
12.10.2019	14.10.2019	Week-2	43.3	11.5	10.1	13.6	0.02	0.03
18.10.2019	21.10.2019	Week-3	41.1	10.8	08.6	11.8	0.04	0.01
19.10.2019	21.10.2019	Week-3	44.4	12.2	10.2	14.4	0.03	0.04
25.10.2019	28.10.2019	Week-4	42.5	10.5	09.5	12.5	0.05	0.03
26.10.2019	28.10.2019	Week-4	43.5	11.7	10.3	12.4	0.02	0.02
November – 2019								
01.11.2019	05.11.2019	Week-1	42.6	12.6	08.8	10.8	0.03	0.02
02.11.2019	05.11.2019	Week-1	43.4	10.8	11.2	12.1	0.02	0.03
08.11.2019	12.11.2019	Week-2	41.1	13.2	09.6	13.5	0.04	0.04
09.11.2019	12.11.2019	Week-2	42.3	11.4	10.3	14.5	0.03	0.03
15.11.2019	19.11.2019	Week-3	44.5	10.6	08.4	12.6	0.03	0.02
16.11.2019	19.11.2019	Week-3	40.1	11.4	10.4	13.5	0.02	0.04
22.11.2019	26.11.2019	Week-4	43.3	12.8	09.8	11.7	0.05	0.04
23.11.2019	26.11.2019	Week-4	41.5	12.5	11.7	12.4	0.04	0.05
29.11.2019	03.12.2019	Week-5	42.2	13.1	09.9	13.9	0.05	0.02
30.11.2019	03.12.2019	Week-5	44.4	10.4	10.5	13.0	0.03	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

Summary of Ambient Air Quality

S. No.	Location		PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)	HC ($\mu g/m^3$)
1	Near Mine Working Area	Min	48.70	15.70	7.10	11.50	0.04	0.02
		Max	58.90	20.10	14.50	19.70	0.09	0.06
		Mean	53.07	17.72	10.38	15.59	0.07	0.04
		10th percentile	50.32	15.96	8.29	12.80	0.06	0.02
		30th percentile	51.20	16.79	8.98	13.99	0.06	0.03
		50th percentile	52.45	17.80	10.25	15.85	0.07	0.04
		95th percentile	58.05	19.87	13.27	18.81	0.08	0.06
		98th percentile	58.58	20.05	13.95	19.33	0.09	0.06
2	Near Dump Site	Min	48.60	14.60	11.30	14.10	0.05	0.03
		Max	57.20	20.10	15.20	19.10	0.09	0.06
		Mean	51.10	17.25	13.08	17.42	0.07	0.05
		10th percentile	48.89	15.73	11.73	15.28	0.05	0.03
		30th percentile	48.86	16.58	12.50	16.89	0.06	0.04
		50th percentile	50.30	17.30	13.00	17.60	0.07	0.05
		95th percentile	54.80	19.28	15.01	18.97	0.08	0.06
		98th percentile	56.10	19.78	15.15	19.05	0.09	0.06
3	Near Haulage Road	Min	48.80	15.40	11.20	15.30	0.04	0.02
		Max	55.20	18.80	15.10	18.80	0.09	0.06
		Mean	51.88	17.11	12.97	16.86	0.07	0.04
		10th percentile	49.70	15.56	11.56	15.50	0.05	0.03
		30th percentile	50.48	16.30	12.29	16.17	0.06	0.03
		50th percentile	51.80	16.95	12.95	16.55	0.07	0.04
		95th percentile	55.07	18.77	14.93	18.40	0.09	0.06
		98th percentile	55.20	18.80	15.05	18.62	0.09	0.06
4	Near Mines Office /DG Set	Min	49.20	15.30	11.00	15.10	0.04	0.02
		Max	54.70	18.50	15.60	19.80	0.08	0.06
		Mean	51.78	16.82	13.36	16.83	0.07	0.05
		10th percentile	49.80	15.66	11.63	15.60	0.05	0.03
		30th percentile	50.59	16.20	12.58	16.17	0.06	0.04
		50th percentile	51.70	16.75	13.50	16.50	0.07	0.05
		95th percentile	54.03	18.09	15.27	18.77	0.08	0.06
		98th percentile	54.42	18.32	15.46	19.34	0.08	0.06
5	Dhangarwadi Village	Min	40.30	10.70	8.50	10.50	0.02	0.01
		Max	44.20	13.70	12.50	15.00	0.07	0.06
		Mean	42.46	12.23	10.32	12.80	0.04	0.04
		10th percentile	41.43	11.50	8.84	11.16	0.03	0.02
		30th percentile	41.80	11.78	9.49	12.07	0.03	0.03
		50th percentile	42.45	12.30	10.35	12.80	0.04	0.04
		95th percentile	44.13	13.39	11.80	14.87	0.07	0.05
		98th percentile	44.20	13.56	12.18	14.95	0.07	0.06
6	Thanewadi	Min	40.30	10.40	8.40	10.60	0.02	0.01

	Village	Max	45.20	14.40	11.30	16.50	0.05	0.05
		Mean	42.60	11.97	9.90	13.30	0.03	0.03
		10th percentile	41.40	10.53	8.62	11.80	0.02	0.02
		30th percentile	41.78	11.53	9.29	12.69	0.03	0.02
		50th percentile	42.35	11.80	9.55	13.30	0.03	0.03
		95th percentile	45.03	13.49	11.20	15.41	0.05	0.04
		98th percentile	45.15	13.99	11.25	16.04	0.05	0.05
7	Pandapniwadi Village	Min	40.30	10.40	8.30	10.50	0.02	0.01
		Max	45.30	14.10	12.30	15.50	0.05	0.05
		Mean	42.59	12.18	10.01	13.16	0.03	0.03
		10th percentile	41.40	10.63	8.73	11.26	0.02	0.02
		30th percentile	42.07	11.49	9.20	12.59	0.03	0.02
		50th percentile	42.35	12.35	10.15	13.25	0.03	0.03
		95th percentile	44.51	13.89	11.59	15.30	0.05	0.05
		98th percentile	44.98	14.01	11.98	15.45	0.05	0.05
8	Gajapur Village	Min	40.10	10.40	8.20	10.80	0.02	0.01
		Max	44.50	14.10	11.70	15.30	0.05	0.05
		Mean	42.62	12.01	9.88	12.90	0.03	0.03
		10th percentile	41.16	10.53	8.46	11.63	0.02	0.01
		30th percentile	42.06	11.40	9.50	12.37	0.03	0.02
		50th percentile	42.55	11.95	9.85	12.65	0.03	0.03
		95th percentile	44.49	13.39	11.29	14.49	0.05	0.04
		98th percentile	44.50	13.78	11.52	14.93	0.05	0.05

Remark:

All the obtained air quality values in core zone and buffer zone as compared with the air quality standards prescribed by Central Pollution Control Board 2009 are found to be within the limit.

Revised National Ambient Air Quality Standards

Revised National Ambient Air Quality Standards (MoEF notification G.S.R 826(E), dated 16.11.2009)

Sl. No	Pollutant	Time Weighted Average	New Standards (Schedule VII, Rule 3 (3B) 16th Nov 2009 Concentration in ambient air		Methods of measurement
			Industrial Area Residential, Rural & other Areas	Ecologically sensitive area (Notified by Central Govt)	
1	Sulphur Dioxide(SO2)	Annual Avg*	50.0 µg/m3	20.0 µg/m3	-Improved West and Gaeke method -Ultraviolet fluorescence
		24 hours**	80.0 µg/m3	80.0 µg/m3	
2	Oxides of Nitrogen as NO2	Annual Avg*	40.0 µg/m3	30.0 µg/m3	-Modified Jocob and Hochheise (Sodium Arsenite) -Chemiluminescence
		24 hours**	80.0 µg/m3	80.0 µg/m3	
3	Particulate matter (size less than 10µm)	Annual Avg*	60.0 µg/m3	60.0 µg/m3	-Gravimetric -TOEM -Beta attenuation
		24 hours**	100.0 µg/m3	100.0 µg/m3	
4	Particulate matter (size less than 2.5 µm	Annual Avg*	40.0 µg/m3	40.0 µg/m3	-Gravimetric -TOEM -Beta attenuation
		24 hours**	60.0 µg/m3	60.0 µg/m3	
5	Lead (Pb)	Annual Avg*	0.50 µg/m3	0.50 µg/m3	-AAS/ICP method for sampling on EPM2000 or Equivalent Filter paper -ED-XRF using Teflon filter paper
		24 hours**	1.0 µg/m3	1.0 µg/m3	
6	Carbon Monoxide (CO)	8 hours**	2.0 mg/m3	2.0 mg/m3	-Non Dispersive Infra Red (NDIR) spectroscopy
		1 hour	4.0 mg/m3	4.0 mg/m3	
7	Ozone	8 hours**	100.0 µg/m3	100.0 µg/m3	-Photometric -Chemiluminescence -Chemical method
		1 hour	180.0 µg/m3	180.0 µg/m3	
		24 hours**	60.0 µg/m3	60.0 µg/m3	
8	Ammonia (NH3)	Annual Avg*	100.0 µg/m3	100.0 µg/m3	-Chemiluminescence -Indo-Phenol Blue method
		24 hours**	400.0µg/m3	400.0 µg/m3	
9	Benzene	Annual Avg*	5.0 µg/m3	5.0 µg/m3	-GC based continuous analyzer -Adsorption/desorption followed by GC analysis
10	Benzo(a) pyrene	Annual Avg*	1.0 ng/m3	1.0 ng/m3	-Solvent extraction followed by GC/HPLC extraction
11	Arsenic	Annual Avg*	6.0 ng/m3	6.0 ng/m3	AAS/ICP method for sampling on EPM2000 OR Equivalent Filter paper
12	Nickel		20.0 ng/m3	20.0 ng/m3	-AAS/ICP method for sampling on EPM2000 OR Equivalent Filter paper

- *Annual Arithmetic mean of minimum 104 measurements in a year taken twice a Week 24 hourly at uniform interval,
- ** 24 hourly / 8 hourly or 1 hourly monitored values as applicable shall be complied with 98 % of the time in a year. However, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Stack Analysis Report

Report No.	**GESEC/PRO/2019-20/12/457**	**Date of Report**	**10/12/2019**
Name of Client	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**		
Project Name and Address	**M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.**		
Sample Collected By	**Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.**		
Date of Sampling	**18/11/2019**		

Name Of Instrument & Calibration Details	**Date of calibration**	**Calibration Due Date**	**Calibration Certificate No.**
Stack Monitoring Kit	**22/12/2018**	**21/12/2019**	**UI/181222/525/001**
Analysis Method	**Emission testing Methodology for Air Pollution-EPA**		

Stack Details

Stack –attached to	DG(45KVA) [-II-]	I.D. of stack at port (m)D	0.10
Crossection of the stack	Round	Stack crossectional area (m^2)	0.0079
Height of stack above ground (m)	5.50	Consumption of fuel (l/hr)	3.0
Fuel used	HSD	Load on the system	Approx.90%

Emission details

Sr. No.	Particulars	Value
1	Temperature (°C)	125.00
2	Differential Pressure	0.50
3	Velocity of the gas (m/sec)	2.68
4	Gas flow rate at NTP (Nm^3/hr)	56.77
5	Particulate matter	22.50
6	SO_2 (Kg/Hr)	0.005

ANALYZED BY **AUTHORIZED SIGNATORY**

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Terms and conditions

1. The report is refer only to the sample tested and not applies to the bulk.
2. The results shown in this test report may differ based on various factors including temperature, humidity, pressure, retention time etc.
3. The test report cannot be reproduced wholly or in part and cannot be used for promotional or publicity purpose without the written consent of laboratory, GESEC.
4. Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer
5. We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement
6. MoEF approved Lab by Govt. of India. From date 09/02/2017 to 08/02/2022.

Stack Analysis Report				
Stack Details				
Stack –attached to	DG (45 KVA) [-II-]		I.D. of stack at port (m)D	0.10
Crossection of the stack	Round		Stack crossectional area	0.0079
Height of stack above	5.50		Consumption of fuel	3.0
Fuel used	HSD		Load on the system	Approx.90%

Emission details		
Sr. No.	**Particulars**	**Value**
1	Temperature (^{o}C)	125.00
2	Differential Pressure	0.50
3	Velocity of the gas (m/sec)	2.68
4	Gas flow rate at NTP (Nm^3/hr)	56.77
5	Particulate matter	22.50
6	SO_2 (Kg/Hr)	0.005

Remark:

The obtained stack monitoring results as compared with the values standards prescribed in consents given by Maharshtra Pollution Control Board 2009 are found to be within the limit.

AMBIENT NOISE LEVEL QUALITY

Noise is nothing but unwanted sound produced due to various activities. As a part of occupational health and safety measures, certain safeguards have been incorporated to mitigate noise pollution in working environment. Noise pollution survey has been carried out in the study area to assess the impacts of the mining activities. So noise level surveys were carried out at 8 selected locations in and around the mine lease area. Noise survey has been conducted in the study area for the period of 24 hr at each location.

AMBIENT NOISE LEVEL MONITORING STATIONS

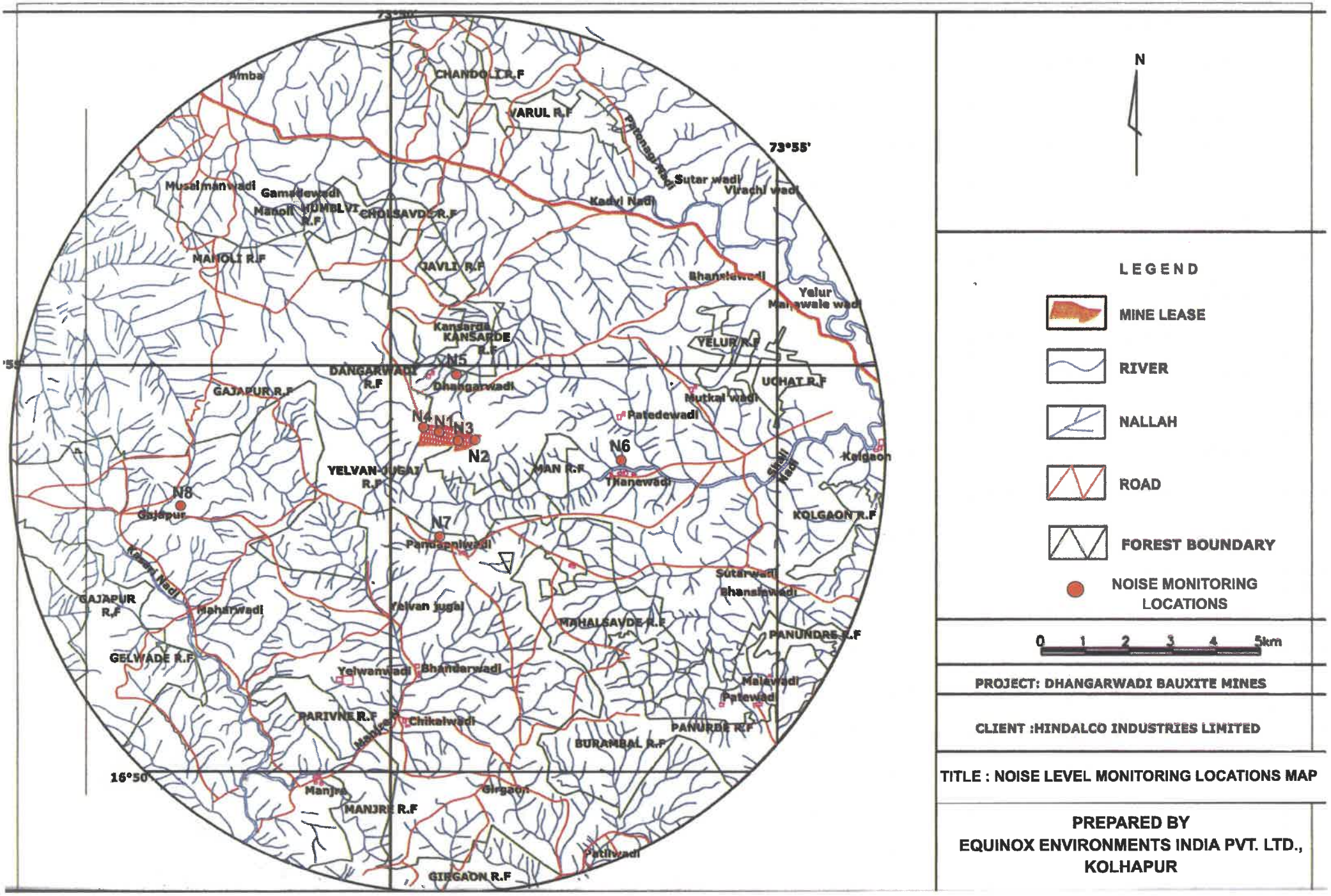
Sl. No.	Station Code	Name Of The Sampling Station	Direction W.R.T. Mines Lease Area
1	A-1	Near Mine Working Area	- - -
2	A-2	Near Dump Site	- - -
3	A-3	Near Haulage Road	- - -
4	A-4	Near Mines Office /DG Set	- - -
5	A-5	Dhangarwadi Village	N
6	A-6	Thanewadi Village	ESW
7	A-7	Pandapniwadi Village	S
8	A-8	Gajapur Village	WSW

NATIONAL AMBIENT NOISE QUALITY STANDARDS

AREA CODE	CATEGORY OF AREA	LIMIT IN dB (A) Leq	
		DAY TIME	NIGHT TIME
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6 am and 9 pm.
2. Night time is reckoned in between 9 pm and 6 am.
3. Silence zone is defined as area up to 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.


N
LEGEND
MINE LEASE
RIVER
NALLAH
ROAD
FOREST BOUNDARY
NOISE MONITORING LOCATIONS
0 1 2 3 4 5km
PROJECT: DHANGARWADI BAUXITE MINES
CLIENT :HINDALCO INDUSTRIES LIMITED
TITLE : NOISE LEVEL MONITORING LOCATIONS MAP
PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR
73°55'
16°50'
N1
N2
N3
N4
N5
N6
N7
N8
Amba
CHANDOLI R.F
VARUL R.F
Musalmanwadi
Gamadewadi
Manoli
HUMBLVI R.F
CHOLSAVDE R.F
MANOLI R.F
JAVLI R.F
Kadvi Nadi
Sutar wadi
Virachi wadi
Bhanslewadi
Yelur
Yelur R.F
Kansarde
KANSARDE R.F
DANGARWADI R.F
Dhangarwadi
GAJAPUR R.F
Nutkal wadi
UCHAT R.F
Patedewadi
YELVAN JUGAI R.F
MAN R.F
Thanewadi
Kolgaon
Gajapur
KOLGAON R.F
Panuspniwadi
Sutarwadi
Bhanslewadi
Yelvan jugai
Maharwadi
MAHALSAVDE R.F
PANUNDRE R.F
GELWADE R.F
Yelwanwadi
Bhandarwadi
Malewadi
Patewad
PARIVNE R.F
Chikalwadi
PANURDE R.F
BURAMBAL R.F
Manjre
Girgaon
MANJRE R.F
Patilwadi
GIRGAON R.F

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Noise Monitoring Report

Report No.	GESEC/PRO/2019-20/12/438-445	**Date of Report**	10/12/2019
Name of Client	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		
Project Name and Address	M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.		
Sample Collected By	Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.		
Date of Sampling	Nov-2019		
Name of Instrument & Calibration Details	**Date of calibration**	**Calibration Due Date**	**Calibration Certificate No.**
Sound Level meter	01/06/2019	31/05/2020	TECH/CAL/2019/671/16
Analysis Method	S: 4758-1968 Reaff.2002.		

Date	04.11.2019	05.11.2019	11.11.2019	12.11.2019	18.11.2019	19.11.2019	25.11.2019	26.11.2019
Location	Near Mine Working Area	Near Dump Site	Near Haulage Road	Near Mines Office /DG Set	Dhangarwadi Village	Thanewadi Village	Pandapniwadi Village	Gajapur Village
Time	N1	N2	N3	N4	N5	N6	N7	N8
6.00	52.6	56.7	54.1	51.8	38.9	39.6	40.1	41.4
7.00	59.7	57.7	59.6	56.9	35.9	36.6	36.9	38.0
8.00	61.3	59.6	61.3	59.0	36.8	38.1	38.4	39.2
9.00	63.2	61.8	60.5	54.9	43.2	41.8	42.5	43.3
10.00	63.2	63.6	62.2	56.9	44.1	44.1	45.8	45.7
11.00	63.7	64.1	63.2	57.7	50.1	49.2	47.2	48.5
12.00	64.9	58.6	63.7	59.6	49.7	49.5	48.1	48.3
13.00	63.1	63.6	62.0	57.4	49.9	49.4	48.1	48.1
14.00	63.1	63.2	61.5	56.9	50.4	50.5	48.2	50.1
15.00	61.4	62.0	59.9	55.2	49.6	48.7	46.2	47.8
16.00	59.8	60.6	60.7	53.9	50.2	47.9	49.5	50.6
17.00	63.5	58.9	60.5	52.8	50.2	43.2	49.7	48.1
18.00	62.7	57.9	63.7	58.0	50.8	50.0	49.6	49.5
19.00	62.1	56.8	59.9	57.7	45.7	45.0	44.7	44.9
20.00	58.8	52.4	55.6	53.3	36.4	35.9	40.8	41.8
21.00	53.3	54.9	58.4	55.7	36.6	36.1	36.5	37.5
22.00	48.0	49.7	52.8	49.6	37.1	36.5	36.8	37.6
L10	**53.0**	**53.9**	**55.0**	**52.4**	**36.5**	**36.3**	**36.9**	**37.9**
L50	**62.1**	**58.9**	**60.5**	**56.9**	**45.7**	**44.1**	**45.8**	**45.7**
L90	**63.6**	**63.6**	**63.4**	**58.4**	**50.3**	**49.7**	**49.5**	**49.7**
Lday	**64.0**	**60.5**	**61.6**	**57.5**	**48.8**	**47.1**	**48.4**	**48.0**
23.00	51.1	48.8	52.2	51.9	39.3	39.6	40.5	40.7
24.00	50.8	49.2	52.5	52.1	39.1	40.4	40.5	41.7
1.00	51.0	49.2	52.8	52.5	39.6	38.6	39.8	40.9
2.00	51.9	49.4	53.5	52.8	39.0	38.4	38.9	39.7
3.00	51.9	50.1	54.0	53.2	38.9	38.4	39.9	40.6
4.00	47.8	45.8	49.2	48.9	40.4	40.9	41.3	42.9
5.00	47.3	45.2	49.1	48.7	39.5	40.4	41.1	42.4
L10	**47.6**	**45.5**	**49.2**	**48.8**	**38.9**	**38.4**	**39.4**	**40.3**
L50	**51.0**	**49.2**	**52.5**	**52.1**	**39.3**	**39.6**	**40.5**	**40.9**
L90	**51.9**	**49.7**	**53.7**	**53.0**	**39.9**	**40.6**	**41.2**	**42.6**

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Lnight	51.3	49.5	52.9	52.4	39.4	39.7	40.5	41.0
Ldn	63.2	60.1	62.1	60.0	49.0	48.2	49.3	49.4
Avg L10	50.3	49.7	52.1	50.6	37.7	37.4	38.2	39.1
Avg L 50	56.5	54.0	56.5	54.5	42.5	41.9	43.1	43.3
Avg L 90	57.7	56.6	58.6	55.7	45.1	45.1	45.3	46.2

Lab Chemist

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AMBIENT NOISE LEVEL MONITORING RESULTS [Leq in dB(A)]

Date	04.11.2019	05.11.2019	11.11.2019	12.11.2019	18.11.2019	19.11.2019	25.11.2019	26.11.2019
Location	Near Mine Working Area	Near Dump Site	Near Haulage Road	Near Mines Office /DG Set	Dhangarwadi Village	Thanewadi Village	Pandapniwadi Village	Gajapur Village
L_{10}	53.0	53.9	55.0	52.4	36.5	36.3	36.9	37.9
L_{50}	62.1	58.9	60.5	56.9	45.7	44.1	45.8	45.7
L_{90}	63.6	63.6	63.4	58.4	50.3	49.7	49.5	49.7
L_{day}	64.0	60.5	61.6	57.5	48.8	47.1	48.4	48.0
L_{10}	47.6	45.5	49.2	48.8	38.9	38.4	39.4	40.3
L_{50}	51.0	49.2	52.5	52.1	39.3	39.6	40.5	40.9
L_{90}	51.9	49.7	53.7	53.0	39.9	40.6	41.2	42.6
L_{night}	51.3	49.5	52.9	52.4	39.4	39.7	40.5	41.0
L_{dn}	63.2	60.1	62.1	60.0	49.0	48.2	49.3	49.4
Avg L_{10}	50.3	49.7	52.1	50.6	37.7	37.4	38.2	39.1
Avg L_{50}	56.5	54.0	56.5	54.5	42.5	41.9	43.1	43.3
Avg L_{90}	57.7	56.6	58.6	55.7	45.1	45.1	45.3	46.2

Remark:

All the obtained noise level quality values in core zone and buffer zone as compared with the noise level standards prescribed by Central Pollution Control Board are found to be within the limit.

WATER QUALITY

Environmental quality monitoring at Dhangarwadi Bauxite Mine of M/s. Hindalco Industries Limited at Dhangarwadi village of Shahuwadi Tahsil, Kolhapur district, Maharashtra includes water monitoring of various environmental components viz. ground, surface and domestic waste water within core zone and buffer zone around the mine lease area.

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

- Surface water quality.
- Ground water quality.

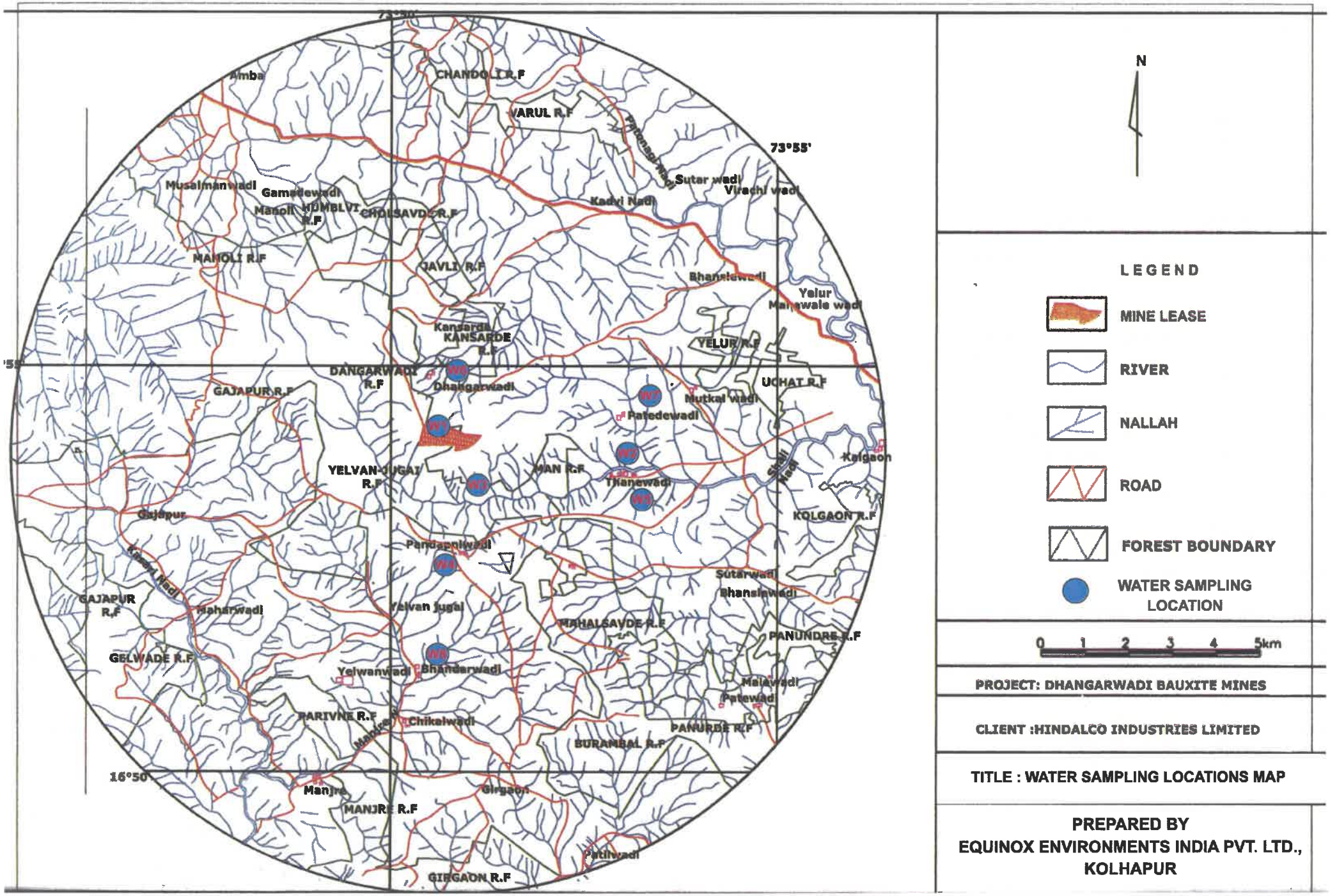
A total of 8 locations have selected, out of which 5 are for ground water and 3 are for surface water. Location of water quality monitoring stations is given below.

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. 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). Samples were collected in the post monsoon season of the year 2019 as per the prescribed sample collecting methods and analyzed as per the IS standard procedures.

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


73°50'
73°55'
16°50'
Amba
CHANDOLI R.F
VARUL R.F
Musalmanwadi
Gamadewadi
Manoli
HUMBLVI R.F
CHOLSAVDE R.F
MANOLI R.F
JAVLI R.F
Kadvi Nadi
Sutar wadi
Virachi wadi
Bhanslewadi
Yelur
Mangwale wadi
YELUR R.F
Kansarde
KANSARDE R.F
DANGARWADI R.F
Dhangarwadi
GAJAPUR R.F
UCHAT R.F
Mutkal wadi
Patedewadi
YELVAN-JUGAI R.F
Thanewadi
Kolgaon
KOLGAON R.F
Gajapur
Pandapnilwadi
Sutarwadi
Bhanslewadi
GAJAPUR R.F
Maharwadi
Yelvan jugai
MAHALSAVDE R.F
PANUNDRE R.F
GELWADE R.F
Yelwanwadi
Bhandarwadi
Malavadi
Patewad
PARIVNE R.F
Chikalwadi
PANURDE R.F
BURAMBAL R.F
Manjre
Girgaon
MANJRE R.F
Patilwadi
GIRGAON R.F
N
LEGEND
MINE LEASE
RIVER
NALLAH
ROAD
FOREST BOUNDARY
WATER SAMPLING LOCATION
0 1 2 3 4 5km
PROJECT: DHANGARWADI BAUXITE MINES
CLIENT :HINDALCO INDUSTRIES LIMITED
TITLE : WATER SAMPLING LOCATIONS MAP
PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR

SURFACE WATER QUALITY

Proper drainage system has prepared to drag the monsoon water into the mine pit area for harvesting rain water and overflow of the same is being channelized through series of check dams and settling tanks so as to reduce the water pollution. Buffer zones have seasonal nallahs which used to recharge the ground water table. A total of 3 locations have selected of which 1 from core zone and 2 from buffer zone.

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CIN No. : U74900PN2013PTC149666

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TEST CERTIFICATE			
Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	**GESEC/PRO/2019-20/12/451-453**
Project Name and Address: M/s. Hindalco Industries Limited, Dhangarwadi Bauxite Mine, Dhangarwadi Village, Shahuwadi Taluka, Kolhapur District, Maharashtra.		**Date of Report**	**10/12/2019**
		Nature of sample	**Surface Water**
		Date of Sampling	**18/11/2019**
		Date of Sample Received	19/11/2019
Sample Collected & Analyzed By: Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra.		**Date of Sample Analysis**	**19/11/2019**

Sr. No.	Parameter	Unit(s)	Location		
			W1 Near Mine Office Borewell	W-2 ShaliNadi Up Stream	W-3 ShaliNadi Down Stream
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5	<5	<5
4.	pH	--	7.65	7.52	7.61
5.	Turbidity	NTU	<5	<5	<5
6.	DO	mg/lit	3.37	4.96	4.22
7.	TDS	mg/lit	153.7	108.22	165.47
8.	TSS	mg/lit	12.31	8.19	14.80
9.	BOD:3 days at 27°C	mg/lit	7.27	4.18	5.99
10.	Alkalinity as $CaCO_3$	mg/lit	15.96	12.62	26.03
11.	Total Hardness as $CaCO_3$	mg/lit	72.68	36.62	99.90
12.	Nitrate as NO_3	mg/lit	12.53	9.58	13.86
13.	Phosphorous as PO_4	mg/lit	0.25	0.01	0.03
14.	Chlorides as Cl^-	mg/lit	43.58	21.44	36.98
15.	Sulphates as SO_4	mg/lit	1.96	0.45	0.69
16.	Sodium as Na	mg/lit	1.18	0.18	0.43
17.	Potassium as K	mg/lit	3.06	1.13	2.88
18.	Calcium as Ca	mg/lit	18.51	9.62	25.77
19.	Magnesium as Mg	mg/lit	6.41	3.05	8.61
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.19	0.10	0.14
27.	Fluorides as F^-	mg/lit	0.07	0.04	0.05

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28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

ANALYZED BY-

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

AUTHORIZED SIGNATORY

SURFACE WATER QUALITY

Sr. No.	Parameter	Unit (s)	Location		
			W-1 Mine Pit Water	W-2 Shali Nadi Up Stream	W-3 Shali Nadi Down Stream
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5	<5	<5
4.	pH	--	7.65	7.52	7.61
5.	Turbidity	NTU	<5	<5	<5
6.	DO	mg/lit	3.37	4.96	4.22
7.	TDS	mg/lit	153.7	108.22	165.47
8.	TSS	mg/lit	12.31	8.19	14.80
9.	BOD:3 days at 27°C	mg/lit	7.27	4.18	5.99
10.	Alkalinity as $CaCO_3$	mg/lit	15.96	12.62	26.03
11.	Total Hardness as $CaCO_3$	mg/lit	72.68	36.62	99.90
12.	Nitrate as NO_3	mg/lit	12.53	9.58	13.86
13.	Phosphorous as PO_4	mg/lit	0.25	0.01	0.03
14.	Chlorides as Cl^-	mg/lit	43.58	21.44	36.98
15.	Sulphates as SO_4	mg/lit	1.96	0.45	0.69
16.	Sodium as Na	mg/lit	1.18	0.18	0.43
17.	Potassium as K	mg/lit	3.06	1.13	2.88
18.	Calcium as Ca	mg/lit	18.51	9.62	25.77
19.	Magnesium as Mg	mg/lit	6.41	3.05	8.61
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.19	0.10	0.14
27.	Fluorides as F^-	mg/lit	0.07	0.04	0.05
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

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TEST CERTIFICATE

Report Number : GESEC/PRO/2019-20/12/437

DHANGARWADI MINES

WELL DEPTHS OF VILLAGES

Date of Sampling	**22/11/2019**
Date of Analysis	**23/11/2019**
Date of Report	**13/12/2019**

Sr. NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACEIN MTS
1	PANDAPNIWADI VILLAGE	**DHANGARWADI**	6.00	1.10
2	DHANGARWADI VILLAGE	**DHANGARWADI**	6.00	2.75

ANALYZED BY-

AUTHORIZED SIGNATORY-

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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1. The report is refer only to the sample tested and not applies to the bulk.
2. The results shown in this test report may differ based on various factors including temperature, humidity, pressure, retention time etc.
3. The test report cannot be reproduced wholly or in part and cannot be used for promotional or publicity purpose without the written consent of laboratory, GESEC.
4. Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer.
5. We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement.
6. MoEF approved Lab by Govt. of India. From date. 09/02/2017 to 08/02/2022.

GROUND WATER QUALITY

The 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.

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 5 locations have selected from buffer zone.

DHANGARWADI MINES			
Well Depths of Villages			
S.No.	**Location**	**Total Depth in Meters**	**Water Level From Surface in Meters**
1	Pandapniwadi Village	6.00	1.10
2	Dhangarwadi Village	6.00	2.75

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TEST CERTIFICATE

Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	**GESEC/PRO/2019-20/12/446-450**
Project Name and Address: **M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.**		**Date of Report**	**10/12/2019**
		Nature of sample	**Ground water**
		Date of Sampling	**18/11/2019**
		Date of Sample Received	**19/11/2019**
		Date of Sample Analysis	**19/11/2019**

Sample Collected & Analyzed By : **Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra**

Sr. No.	Parameter	Unit(s)	Location: PANDAPNI WADI VILLAGE	THANEWADI VILLAGE	DHANGARWADI VILLAGE	PATEWADI VILLAGE	BHANDAR WADI VILLAGE
			W-4	W-5	W-6	W-7	W-8
1.	Odour	--	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Color	Hazen units	<5	<5	<5	<5	<5
4.	pH	--	7.65	7.52	7.60	7.55	7.59
5.	Turbidity	NTU	<5.00	<5.00	<5.00	<5.00	<5.00
6.	Dissolved Oxygen	mg/l	2.82	2.36	2.91	2.35	2.65
7.	Total Dissolved solids	mg/l	152.32	129.50	136.98	144.57	142.91
8.	Total Suspended solids	mg/l	2.75	3.84	3.96	4.98	5.01
9.	B.O.D	mg/l	4.58	2.98	3.5	4.11	3.75
10.	Alkalinity as $CaCO_3$	mg/l	13.74	15.96	10.27	22.11	22.73
11.	Total Hardness as $CaCO_3$	mg/l	127.27	71.94	67.10	61.11	89.69
12.	Nitrate as NO_3	mg/l	5.62	6.28	9.02	10.43	15.87
13.	Phosphates as PO_4	mg/l	0.46	0.83	0.66	0.11	0.69
14.	Chlorides as Cl	mg/l	45.86	32.97	55.93	37.14	21.25
15.	Sulphates as SO_4	mg/l	5.31	9.01	4.70	8.26	3.71
16.	Sodium as Na	mg/l	1.45	2.35	1.98	4.74	6.22
17.	Potassium as K	mg/l	8.36	7.54	3.24	10.53	13.05
18.	Calcium as Ca	mg/l	29.50	19.86	14.76	18.05	21.44
19.	Magnesium as Mg	mg/l	12.99	5.41	7.33	3.88	8.76
20.	Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL
21.	Manganese as Mn	mg/l	BDL	BDL	BDL	BDL	BDL
22.	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL
23.	Chromium as Cr	mg/l	BDL	BDL	BDL	BDL	BDL
24.	Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL
25.	Zinc as Zn	mg/l	BDL	BDL	BDL	BDL	BDL
26.	Iron as Fe	mg/l	0.02	0.04	0.09	BDL	0.01
27.	Fluoride as F	mg/l	0.01	0.25	BDL	0.32	0.18
28.	Mercury as Hg	mg/l	BDL	BDL	BDL	BDL	BDL
29.	Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL
30.	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL
31.	Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL
32.	Boron as B	mg/l	BDL	BDL	BDL	BDL	BDL

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

Sr. No.	Parameter	Unit (s)	Location				
			W-4 Pandapniwadi Village	W-5 Thanewadi Village	W-6 Dhangarwadi Village	W-7 Patewadi Village	W-8 Bhandar Wadi Village
1.	Odour	--	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Color	Hazen units	<5.00	<5.00	<5.00	<5.00	<5.00
4.	pH	--	7.65	7.52	7.60	7.55	7.59
5.	Turbidity	NTU	<5.00	<5.00	<5.00	<5.00	<5.00
6.	Dissolved Oxygen	mg/l	2.82	2.36	2.91	2.35	2.65
7.	Total Dissolved solids	mg/l	152.32	129.50	136.98	144.57	142.91
8.	Total Suspended solids	mg/l	2.75	3.84	3.96	4.98	5.01
9.	B.O.D	mg/l	4.58	2.98	3.5	4.11	3.75
10.	Alkalinity as $CaCO_3$	mg/l	13.74	15.96	10.27	22.11	22.73
11.	Total Hardness as $CaCO_3$	mg/l	127.27	71.94	67.10	61.11	89.69
12.	Nitrate as NO_3	mg/l	5.62	6.28	9.02	10.43	15.87
13.	Phosphates as PO_4	mg/l	0.46	0.83	0.66	0.11	0.69
14.	Chlorides as Cl	mg/l	45.86	32.97	55.93	37.14	21.25
15.	Sulphates as SO_4	mg/l	5.31	9.01	4.70	8.26	3.71
16.	Sodium as Na	mg/l	1.45	2.35	1.98	4.74	6.22
17.	Potassium as K	mg/l	8.36	7.54	3.24	10.53	13.05
18.	Calcium as Ca	mg/l	29.50	19.86	14.76	18.05	21.44
19.	Magnesium as Mg	mg/l	12.99	5.41	7.33	3.88	8.76
20.	Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL
21.	Manganese as Mn	mg/l	BDL	BDL	BDL	BDL	BDL
22.	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL
23.	Chromium as Cr	mg/l	BDL	BDL	BDL	BDL	BDL
24.	Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL
25.	Zinc as Zn	mg/l	BDL	BDL	BDL	BDL	BDL
26.	Iron as Fe	mg/l	0.02	0.04	0.09	BDL	0.01
27.	Fluoride as F	mg/l	0.01	0.25	BDL	0.32	0.18
28.	Mercury as Hg	mg/l	BDL	BDL	BDL	BDL	BDL
29.	Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL
30.	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL
31.	Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL
32.	Boron as B	mg/l	BDL	BDL	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

DRINKING WATER STANDERDS AS PER IS:10500

Sr. No.	Parameter	Unit	Desirable Limit	Maximum Permissible Limit
1	Odor		Un-objectionable	
2	Taste		Agreeable	
3	Colour	Hazen unit	5.00	25.00
4	pH		6.5-8.5	
5	Turbidity	NTU	5.00	10.00
6	Dissolved Oxygen	mg/l	---	
7	Total Dissolved Solids	mg/l	500.00	2000.00
8	Total Suspended Solids	mg/l	---	
9	BOD 3 at 27^0C	mg/l	---	
10	Alkalinity as $CaCO_3$	mg/l	200.00	600.00
11	Total Hardness as $CaCO_3$	mg/l	300.00	600.00
12	Nitrates as NO_3	mg/l	45.00	100.00
13	Phosphorus as PO_4	mg/l	----	
14	Chlorides as Cl	mg/l	250.00	1000.00
15	Sulphates as SO_4	mg/l	200.00	400.00
16	Sodium as Na	mg/l	----	
17	Potassium as K	mg/l	----	
18	Calcium as Ca	mg/l	75.00	200.00
19	Magnesium as Mg	mg/l	30.00	100.00
20	Lead (Pb)	mg/l	0.05	0.05
21	Manganese(Mn)	mg/l	0.10	0.30
22	Cadmium (Cd)	mg/l	0.01	0.01
23	Chromium(Cr)	mg/l	0.05	0.05
24	Copper (Cu)	mg/l	0.05	1.50
25	Zinc (Zn)	mg/l	5.00	15.00
26	Iron (Fe)	mg/l	0.30	1.00
27	Fluoride (F)	mg/l	1.00	1.50
28	Mercury (Hg)	mg/l	0.001	0.001
29	Selenium (Se)	mg/l	0.01	0.01
30	Arsenic (As)	mg/l	0.05	0.05
31	Cyanide (Cn)	mg/l	0.05	0.05
32	Boron (B)	mg/l	1.00	5.00

GREEN ENVIROSAFE
Engineers & Consultant Pvt Ltd.
Survey No-1405/06, Mayuri Residency, Shop No-16, 2nd Floor, Sanaswadi, Tal-Shirur, Pune-412208.
Mob-+ 9545084620 | E-mail:gesec12@gmail.com | www.greenenvirosafe.co.in
CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Domestic Effluent Analysis Report

Report No.	**GESEC/PRO/2019-20/12/458**	**Date of Report**	**10/12/2019**
Name of Client	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**		
Project Name and Address	**M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.**		
Sample Collected By	**Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.**		
Date of Sampling	**21/10/2019**		
Sample Location	**Canteen waste water**		

Domestic Effluent Analysis

Sl.No	Unit	Parameter	Result	MPCB Standards	Analysis Method
1	mg/l	Total Suspended Solids	56.23	100	APHA 2540-D
2	mg/l	Total Dissolved Solids	725.60	2100	IS : 3025 (Part 16):1984
3	mg/l	COD	59.32	250	APHA 5220 B
4	mg/l	BOD for 3 days at 27°C	23.89	100	APHA 5210 B
5	mg/l	Total Solids	781.83	------	IS3025(part 16):1984
6	mg/l	Oil and Grease	<5	10	APHA 5520 B

ANALYZED BY

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

AUTHORIZED SIGNATORY

Terms and conditions

1. The report is refer only to the sample tested and not applies to the bulk.
2. The results shown in this test report may differ based on various factors including temperature, humidity, pressure, retention time etc.
3. The test report cannot be reproduced wholly or in part and cannot be used for promotional or publicity purpose without the written consent of laboratory, GESEC.
4. Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer
5. We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement
6. MoEF approved Lab by Govt. of India. From date 09/02/2017 to 08/02/2022.

GREEN ENVIROSAFE
Engineers & Consultant Pvt Ltd.
Survey No-1405/06, Mayuri Residency, Shop No-16, 2nd Floor, Sanaswadi, Tal-Shirur, Pune-4122(
Mob-+ 9545084620 | E-mail:gesec12@gmail.com | www.greenenvirosafe.co.in
CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Domestic Effluent Analysis Report

Report No.	GESEC/PRO/2019-20/12/459	Date of Report	10/12/2019
Name of Client	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		
Project Name and Address	M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.		
Sample Collected By	Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.		
Date of Sampling	18/11/2019		
Sample Location	Canteen waste water		

Domestic Effluent Analysis

Sl.No	Unit	Parameter	Result	MPCB Standards	Analysis Method
1	mg/l	Total Suspended Solids	61.02	100	APHA 2540-D
2	mg/l	Total Dissolved Solids	844.97	2100	IS : 3025 (Part
3	mg/l	COD	69.32	250	APHA 5220 B
4	mg/l	BOD for 3 days at 27°C	25.68	100	APHA 5210 B
5	mg/l	Total Solids	905.99	------	IS3025(part
6	mg/l	Oil and Grease	<5	10	APHA 5520 B

ANALYZED BY

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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4. Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer
5. We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement
6. MoEF approved Lab by Govt. of India. From date 09/02/2017 to 08/02/2022.

DOMESTIC EFFLUENT ANALYSIS

There is only source of waste water on site is canteen effluent. All the employees daily have their two meals in this canteen according to their shifts. Sample was collected two times from outlet and analyzed. Results are given below.

DOMESTIC EFFLUENT ANALYSIS

Sample Location: Canteen water waste

Date of Sampling: 21/10/2019

Sr. No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	56.23	100
2	mg/l	Total Dissolved Solids	725.60	2100
3	mg/l	COD	59.32	250
4	mg/l	BOD for 3 days at 27°C	23.89	100
5	mg/l	Total Solids	781.83	--
6	mg/l	Oil and Grease	<5.00	10

Sample location: Canteen water waste

Date of Sampling: 18/11/2019

Sr. No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	61.02	100
2	mg/l	Total Dissolved Solids	844.97	2100
3	mg/l	COD	69.32	250
4	mg/l	BOD for 3 days at 27°C	25.68	100
5	mg/l	Total Solids	905.99	--
6	mg/l	Oil and Grease	<5.00	10

Note:

- mg/l: milligram per liter

Remark:

All the parameters of the canteen waste water samples collected are well below the desirable standard prescribed in consent given by the Maharashtra Pollution Control Board.

SOIL QUALITY

The normal mineral composition of plants is affected by alteration in soil condition. It is essential to determine the potential of soil in the area and identify the impacts of mining activity on soil quality. So soil sample has been collected from different villages around the lease area during study period. In order to study the soil profile of the region, sampling locations were selected to assess the existing soil conditions around the project area representing various land use conditions.

The physico-chemical and heavy metal concentrations were determined. The soil sample was prepared in accordance with IS: 2720 (Part-I)-1983 for various tests. The sampling locations have been identified to determine the baseline soil characteristics of study area.

The present study on soil profile establishes the environmental characteristics and identifies the incremental concentrations if any, due to the mining activities. The sampling locations have been identified with the following objectives:

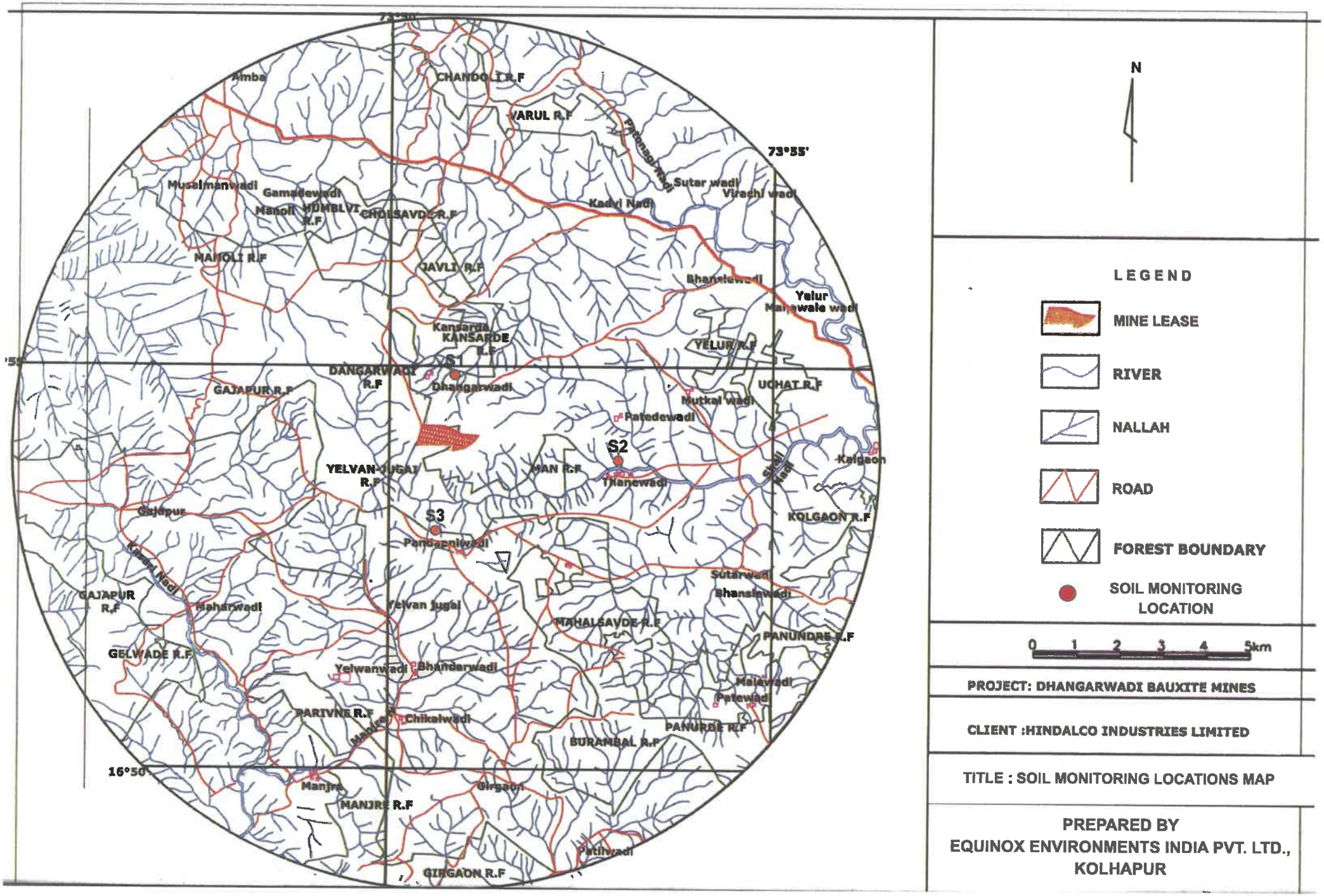
- To determine the soil characteristics of the study area
- To determine the impact of mining activity on soil characterization and
- To determine the impact on soils more importantly from agricultural productivity point of view.

SAMPLING DETAILS

A total of three locations were selected for analyzing the soil quality status in study area. The soil samples were collected from the selected areas. The samples have been analyzed for physico-chemical parameters and were given in the table.

SOIL QUALITY MONITORING LOCATIONS

Code	Name of Sampling Station	Direction w.r.t. Mines Lease Area
S-1	Dhangarwadi village	N
S-2	Thanewadi village	ESW
S-3	Pandapniwadi village	S


N
73°55'
16°50'
Amba
CHANDOLI R.F
VARUL R.F
Sutar wadi
Virachi wadi
Kadvi Nadi
Musalmanwadi
Gamadewadi
Manoli
KUMBLVI R.F
CHOLSAVDE R.F
MANOLI R.F
JAVLI R.F
Bhanslewadi
Yelur
Kansarde
KANSARDE R.F
YELUR R.F
DANGARWADI R.F
S1
Dhangarwadi
UCHAT R.F
GAJAPUR R.F
Nutkal wadi
Patedewadi
S2
YELVAN-JUGAI R.F
MAN R.F
Thanewadi
Kalgaon
Gajapur
S3
KOLGAON R.F
Pandagniwadi
Sutarwadi
Bhanslewadi
GAJAPUR R.F
Maharwadi
Yelvan jugai
MAHALSAVDE R.F
PANUNDRE R.F
GELWADE R.F
Yelwanwadi
Bhanderwadi
Malewadi
Patewadi
PARIVNE R.F
Chikalwadi
PANURDE R.F
BURAMBAL R.F
Manjre
Girgaon
MANJRE R.F
Patilwadi
GIRGAON R.F
LEGEND
MINE LEASE
RIVER
NALLAH
ROAD
FOREST BOUNDARY
SOIL MONITORING LOCATION
0 1 2 3 4 5km
PROJECT: DHANGARWADI BAUXITE MINES
CLIENT :HINDALCO INDUSTRIES LIMITED
TITLE : SOIL MONITORING LOCATIONS MAP
PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR

GREEN ENVIROSAFE
Engineers & Consultant Pvt Ltd.
Survey No-1405/06, Mayuri Residency, Shop No-16, 2nd Floor, Sanaswadi, Tal-Shirur, Pune-412208.
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Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

TEST CERTIFICATE

Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	**GESEC/PRO/2019-20/12/454-456**
Project Name and Address: M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.		**Date of Report**	**10/12/2019**
		Nature of sample	**Soil**
		Date of Sampling	**18/11/2019**
		Date of Sample Received	**19/11/2019**
		Date of Sample Analysis	**19/11/2019**
Sample Collected & Analyzed By :		**Green Envirosafe Engineers & Consultant Pvt. Ltd., Pune, Maharashtra**	

Sr.No.	Test Parameters	Locations		
		S1- Dhangarwadi Village	S2- Thanewadi Village	S3- Pandapniwadi Village
1	pH (1:5Aq. Extraction)	7.81	8.15	7.89
2	E.C. (µs)(1:5 Aq. Suspension	2.78	2.96	2.84
3	Nitrates (mg/kg)	45.02	70.78	53.01
4	Available Phosphorus as P_2O_5 (mg/kg)	11.03	57.83	33.69
5	Potassium as K_2O (mg/kg)	25.81	84.01	53.92
6	Available Sodium as Na_2O (mg/kg)	0.23	0.98	0.63
7	Ex. Calcium (mg/kg)	459.12	568.41	539.87
8	Ex. Magnesium (mg/kg)	249.37	300.12	268.51
9	Water Soluble Chlorides as Cl (mg/kg)	250.01	289.17	276.94
10	Organic Carbon (%)	1.56	1.92	1.86
11	Texture	Sandy Soil	Sandy Soil	Sandy
	a) Sand (%)	61.32	58.02	57.94
	b) Silt (%)	9.14	12.96	10.33
	c) Clay (%)	29.54	29.02	31.73
12	Total Soluble Salts (mg/kg)	1862.40	1986.37	1900.24

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

SOIL QUALITY

Sr. No.	Test Parameters	Locations		
		S-1 Dhangarwadi Village	S-2 Thanewadi Village	S-3 Pandapniwadi Village
1	pH (1:5Aq. Extraction)	7.81	8.15	7.89
2	E.C. (µs)(1:5 Aq. Suspension	2.78	2.96	2.84
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	c) Clay (%)	29.54	29.02	31.73
12	Total Soluble Salts (mg/kg)	1862.40	1986.37	1900.24

DHANGARWADI
BAUXITE MINE

TAHSIL: SHAHUWADI, DISTRICT: KOLHAPUR,
STATE: MAHARASHTRA

OF

M/s HINDALCO INDUSTRIES LTD.

ENVIRONMENTAL QUALITY MONITORING REPORT

SEASON - WINTER 2019-20

DECEMBER, JANUARY, FEBRUARY

PREPARED BY

EQUINOX™
Equinox Environments (India) Pvt. Ltd.

EQUINOX ENVIRONMENTS (I) PVT. LTD.,
ENVIRONMENTAL;CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS,
KOLHAPUR (MS)
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An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION

2019 - 2020

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PREFACE

M/s. Hindalco Industries Limited entrusted environmental quality monitoring at **Dhangarwadi Bauxite Mine** situated in Dhangarwadi village, Shahuwadi Tahsil, Kolhapur District, Maharashtra to **Equinox Environments (India) Pvt. Ltd.** during winter season of the year 2019-20.

According to MoU dt. 1st September 2018, The **Equinox Environments (India) Pvt. Ltd.** has availed the various monitoring services by lab viz. **Green Envirosafe Engineers & Consultant Pvt. Ltd.** which is recognized and duly approved by the **Ministry of Environment, Forests & Climate Change (MoEFCC); New Delhi** (through Notification No. S.O. 1174 (E) dated 18.07.2007 as amended vide Notification No. S.O. 388 (E) dated 10.02.2017) and NABL (ISO/IEC 17025:2005 vide certificate number TC-8061 dated 03.11.2018) has also received certifications namely ISO 9001:2015 and OHSAS 18001: 2007 from Crescent Quality Certification Pvt. Ltd.

The environmental monitoring for water quality was carried out in core zone and buffer zone during the months of December–2019, January & February 2020. The data obtained was complied to assess the current environmental status of the mining as well as the surrounding villages in the study area for following environmental parameters.

- Micro-meteorology
- Ambient air quality
- Ambient noise level quality
- Water quality
- DG set Stack monitoring

The data obtained was complied to assess the current environmental status of the mining as well as the surrounding villages in the study area.

Equinox Environments India Pvt. Ltd. gratefully acknowledges the cooperation extended by management and staff of M/s. Hindalco Industries Limited and village people to the field staff.

EXECUTIVE SUMMARY

Dhangarwadi Bauxite Mine of M/s. Hindalco Industries Limited includes the study of the ambient air quality, noise level quality and water quality in core zone and buffer zone in and around the mine lease area during the winter season of the year 2019-20.

AMBIENT AIR QUALITY

The scenario of the existing ambient air quality in the study region has been assessed through a network of selected ambient air quality locations. Pre-calibrated respirable dust and fine particulate sampler has been used for AAQ monitoring. Maximum, minimum, average and percentile values have been computed from the data collected at all individual sampling stations to represent the ambient air quality status.

AMBIENT NOISE LEVEL MONITORING

Mining and allied activities usually cause noise pollution. Excessive noise levels cause adverse effects on human beings and associated environment including domestic animals, wild life, natural ecosystem and structures. To know the ambient noise levels in the study area, noise levels were recorded at mining area and nearby villages using noise level meter.

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.

MICROMETEOROLOGY

Meteorological scenario helps to understand the trends of the climatic factors. It also helps in the identification of sampling stations in the study area meteorological scenario experts a critical influence on air quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions.

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 to 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.

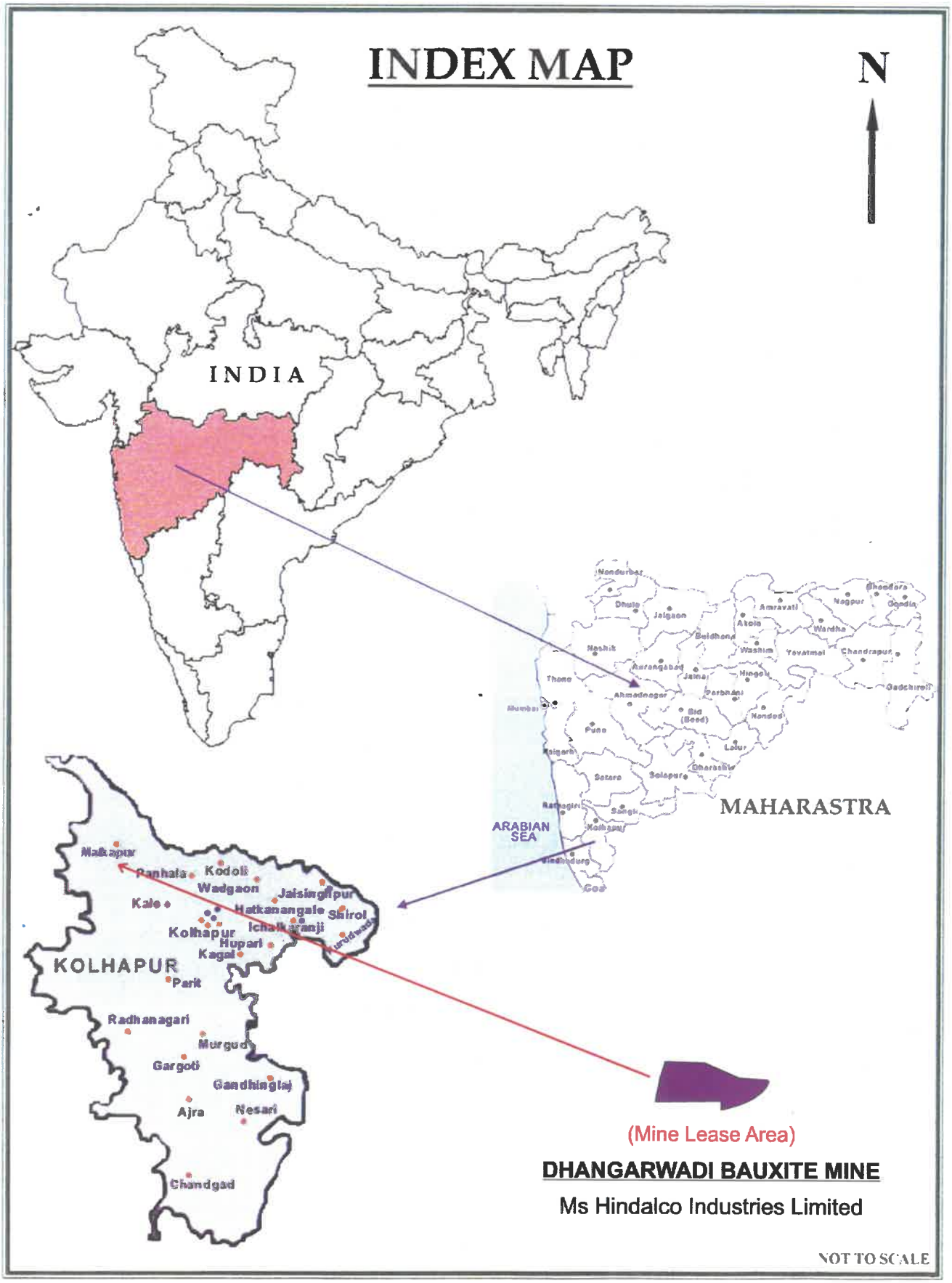
As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 41. 80 ha and the same was approved by the Indian Bureau of Mines vide letter no. MP/KLP/MAH-73-SZ, DT.11/11/2003on submission of approved mining plan Government of Maharashtra has sanctioned mining lease for the production of bauxite in the revenue land and The Environmental Clearance was obtained for the production of 0.6 million TPA of bauxite over the entire area. The mining lease was executed by the collector of Kolhapur over the area on 05/05/2008 and the lease expires on 04/05/2038.

MINE DETAIL

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

GEOGRAPHICAL DETAILS

Latitude:	16.0°54.0'0.0"
Longitude:	73.0°49.0'5.0"
MSL:	1020 m

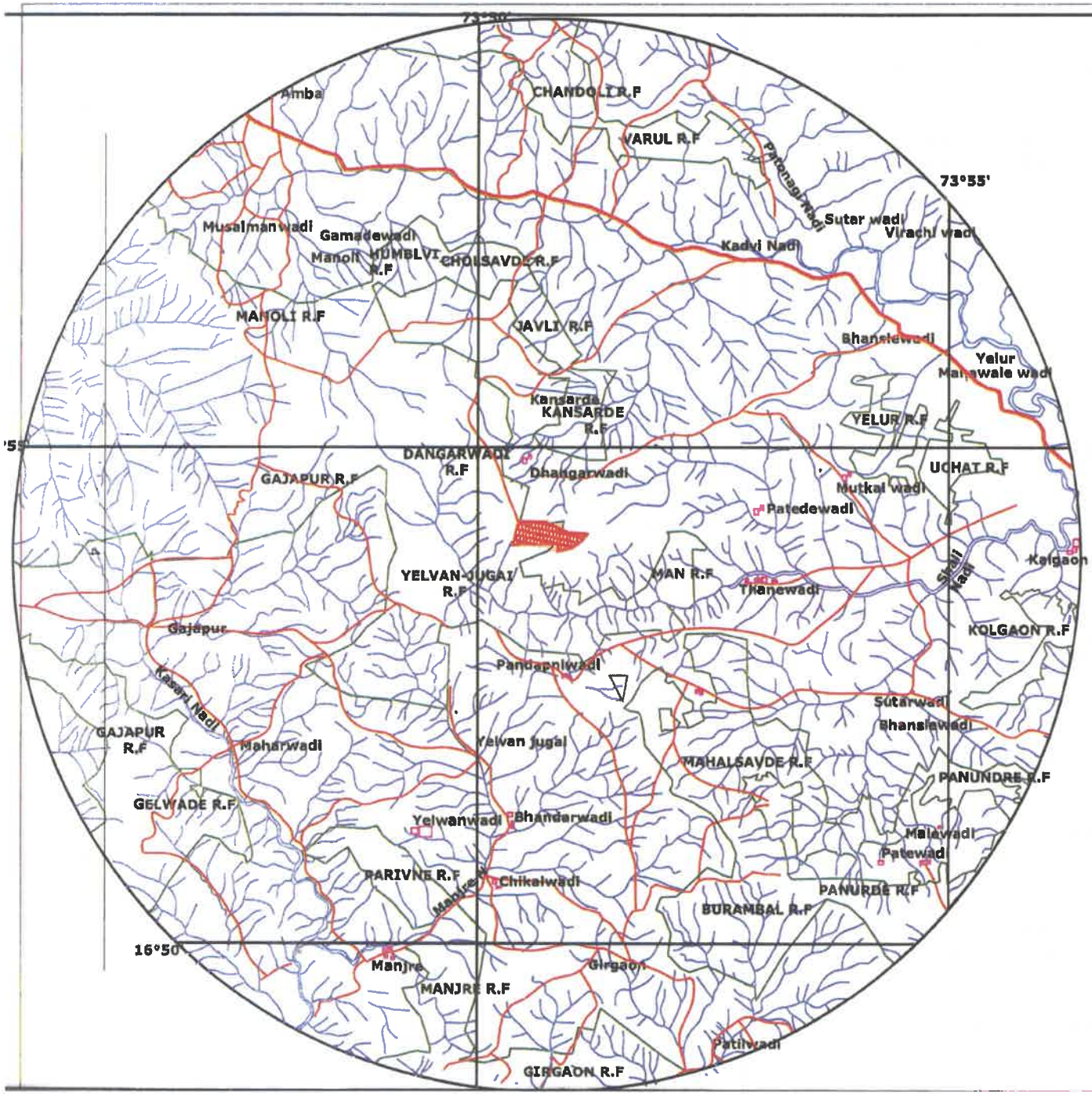

INDEX MAP
N
INDIA
MAHARASTRA
ARABIAN SEA
KOLHAPUR
Malkapur
Panhala
Kodoli
Wadgaon
Jaisingpur
Kale
Hatkanangale
Shirol
Kolhapur
Ichalkaranji
Hupari
Kagal
Parit
Radhanagari
Murgud
Gargoti
Gandhinglaj
Ajra
Nesari
Chandgad
(Mine Lease Area)
DHANGARWADI BAUXITE MINE
Ms Hindalco Industries Limited
NOT TO SCALE

DETAILS OF LEASE AREA

The following table gives the details of the area in terms of District, Tahsil, Village, Gat no. and Area granted in hectors.

District	Tahsil	Village	Gat No.	Area Granted (ha)
Kolhapur	Shahuwadi	Dhangarwadi	45	12.32
			46 (p)	6.53
			50(p)	2.17
			52	10.58
			53(p)	5.09
			56(p)	2.76
		Ainwadi	106(p)	2.35
			Total	**41.80**

DHANGARWADI BAUXITE MINE (M/s. Hindalco Industries Limited)	
DETAILS	
State	Maharashtra
District	Kolhapur
Tahsil	Shahuwadi
Village	Dhangarwadi
Latitude	16°54'0.0"
Longitude	73°49'5.0"
Nature of the area	Plateau terrain
Toposheet no.	47 H/13.
GENERAL CLIMATIC CONDITIONS	
Maximum temperature	40.0° C
Minimum temperature	16.0° C
ACCESSIBILITY	
Road connectivity	Approached by road connecting Dhopeshwar Junction which is at a distance of 8 kms, located 6 kms from Malkapur Town on Ratnagiri-Nagpur National Highway (NH-204).
Rail connectivity	Kolhapur railway station (56 km)
Airport	Kolhapur (60 km)
Sea Port	Ratnagiri (95 km)
Biosphere reserve	Not any
Sanctuary	Chandoli wild life sanctuary is situated at about 20 kms.



N

LEGEND

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

0 1 2 3 4 5km

PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE: TOPOGRAPHICAL MAP OF THE STUDY AREA

Prepared By
Equinox Environments India Pvt. Ltd.,
Kolhapur

MICRO-METEOROLOGY

Meteorological data within the project area during the air quality survey period was assessed.

PRIMARY / BASIC METEOROLOGICAL PARAMETERS

- Wind Speed (Km/h)
- Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors these factors are considered as primary meteorological parameters.

SECONDARY METEOROLOGICAL PARAMETERS

- Ambient Temperature
- Humidity

Meteorological Data December - 2019							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
02.12.2019	18	30	65	0	8	4.0	E, SE, W
03.12.2019	19	33	67	0	10	5.0	E, SE, W
09.12.2019	17	31	71	0	13	6.5	E, SE, W
10.12.2019	18	32	56	0	12	6.0	E, SE, W
16.12.2019	19	32	58	0	11	5.5	E, SE, W
17.12.2019	17	34	62	0	14	7.0	E, SE, W
23.12.2019	17	32	58	0	10	5.5	E, SE, W
24.12.2019	19	30	62	0	13	7.0	E, SE, W

Meteorological Data January - 2020							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
06.01.2020	17	32	62	0	7	3.5	E,W,SE
07.01.2020	19	34	59	0	10	5.0	E,W,SE
13.01.2020	18	31	60	0	9	4.5	E,W,SE
14.01.2020	17	32	61	0	7	3.5	E,W,SE
20.01.2020	17	34	58	0	12	6.0	E,W,SE
21.01.2020	18	32	59	0	14	7.0	E,W,SE
27.01.2020	19	35	61	0	10	5.0	E,W,SE
28.01.2020	17	34	60	0	11	5.5	E,W,SE

Meteorological Data February - 2020							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
03.02.2020	16	32	58	0	8	4.0	W,E,NW
04.02.2020	17	31	60	0	11	5.5	W,E,NW
10.02.2020	16	34	59	0	10	5.0	W,E,NW
11.02.2020	18	35	61	0	11	5.5	W,E,NW
17.02.2020	19	33	60	0	9	4.5	W,E,NW
18.02.2020	18	32	57	0	11	5.5	W,E,NW
24.02.2020	16	34	59	0	8	4.0	W,E,NW
25.02.2020	18	35	60	0	12	6.0	W,E,NW

ENVIRONMENTAL QUALITY

Environmental quality monitoring at Dhangarwadi Bauxite Mine of M/s. Hindalco Industries Limited at Dhangarwadi village of Shahuwadi Tahsil, Kolhapur district, Maharashtra includes monitoring of various environmental components like air, noise and soil water quality status within core zone and buffer zone in and around the mine lease area.

AMBIENT AIR QUALITY

The main aim of the ambient air quality monitoring within core zone and buffer zone was to assess the environmental condition and to know the existing levels of the air pollution in the project area. Air pollution forms an important and critical factor to study the environmental issues in the mining areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to mining and allied activities. Ambient air quality monitoring stations were set up at eight selected locations, 4 in core zone and 4 in buffer zone.

SELECTION OF SAMPLING LOCATIONS

The status of the ambient air quality has been assessed through ambient air quality-monitoring network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions on synoptic scale
- Topography of the study area
- Representatives of regional background air quality for obtaining

Ambient air quality monitoring stations were set up at eight locations, 4 in core zone and 4 in buffer zone with due considerations to the above mentioned points.

INSTRUMENT USED FOR SAMPLING

Ambient Fine Dust Sampler was used for monitoring particulate matter (PM_{10}), particulate matter ($PM_{2.5}$) and other gaseous pllutants.

Sr. No.	Instrument Name	Ambient Fine Dust Sampler
1.	**Model No.**	IPM-FDS-M 2.5µ/10µ Fine Dust Sampler
2.	**Serial No.**	FDSM/2018-19/368-1
3.	**Calibration Details**	From 02/08/2019 To 02/07/2020
4.	**Calibration Certificate No.**	IPM-FDS/18-19/368-1

METHOD FOR TESTING PM_{10}/ $PM_{2.5}$

Sr. No.	Content	Details
1.	Name of Pollutant	PM_{10}/ $PM_{2.5}$
2.	Medium	Air
3.	Instrument	Respirable Dust Sampler / Fine Particulate Sampler
4.	Duration	24 hourly
5.	Mode	Continuous
6.	Unit	µg/m^3
7.	Method	Gravimetric

METHOD FOR TESTING

Sr. No.	Name of Pollutant	Sulphur Dioxide	Oxides of Nitrogen	Carbon monoxide
1.	**Method**	Modified West & Geake Method	Modified Jacob & Hochheiser Modified (Na-Arsenite) Method	NDIR Method
2.	**Frequency**	24 hourly	24 hourly	24 hourly
3.	**Mode**	Continuous	Continuous	Continuous
4.	**Unit**	µg/m^3	µg/m^3	mg/m^3
5.	**Procedure**	AS Per IS 5182 (Part II)	AS Per IS 5182 (Part IV)	NDIR Method

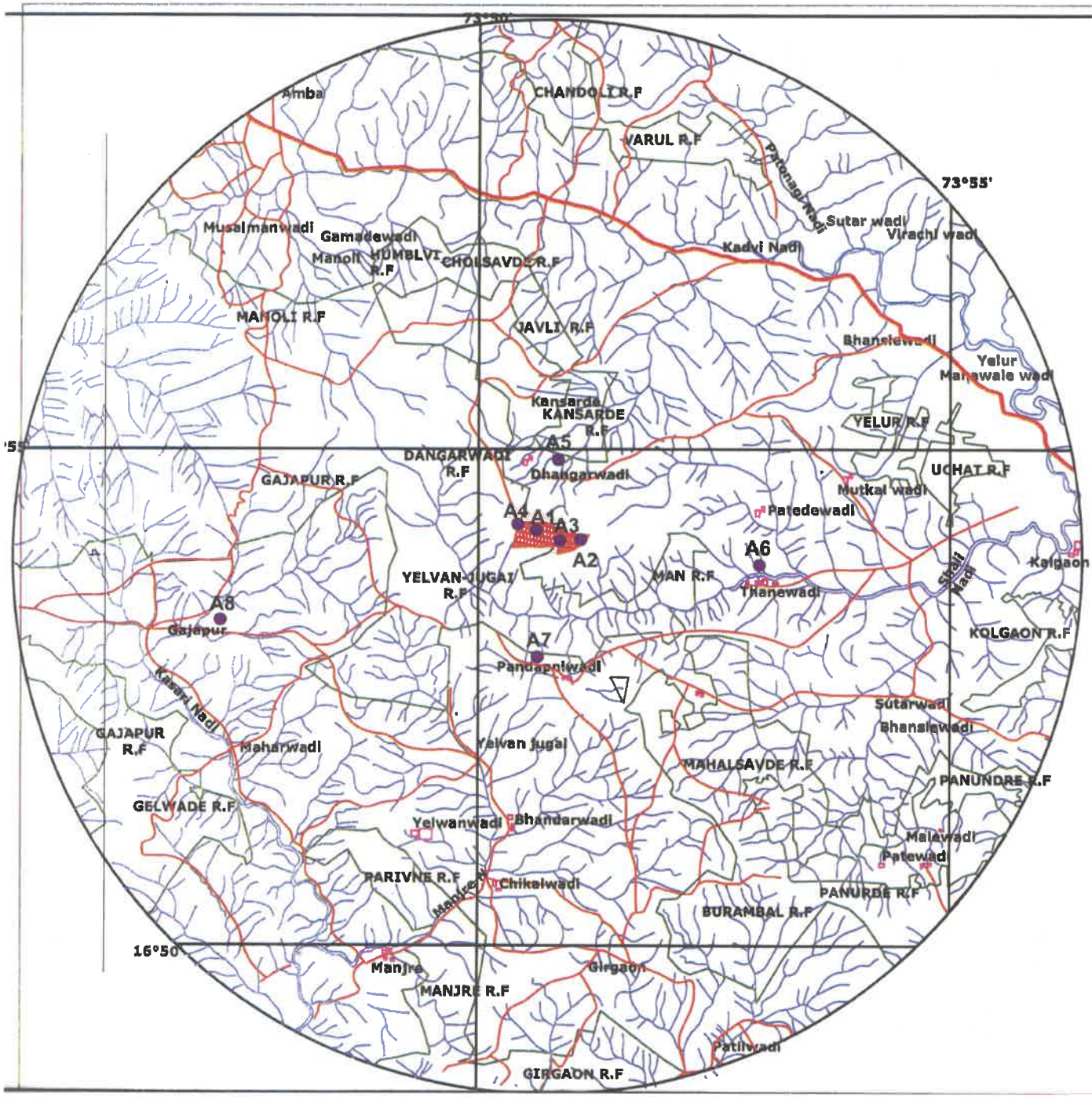
Monitoring Location Details

Respirable dust sampler and Fine particulate sampler were placed at a height of 3 m above the ground level in above mentioned monitoring locations. These stations were selected so as to assess present pollution level due to mining and allied activities. The observed levels of PM_{10}, $PM_{2.5}$, $S0_2$, NOx, CO and HC collected during winter

season of the year 2019-20 are presented in annexure and are summarized in the following table.

AMBIENT AIR QUALITY MONITORING STATION

Sl. No.	Station Code	Name Of The Sampling Station	Direction W.R.T. Mines Lease Area
1	A-1	Near Mine Working Area	- - -
2	A-2	Near Dump Site	- - -
3	A-3	Near Haulage Road	- - -
4	A-4	Near Mines Office /DG Set	- - -
5	A-5	Dhangarwadi Village	N
6	A-6	Thanewadi Village	ESW
7	A-7	Pandapniwadi Village	S
8	A-8	Gajapur Village	WSW



N

LEGEND

- MINE LEASE
- RIVER
- NALLAH
- ROAD
- FOREST BOUNDARY
- AIR MONITORING LOCATIONS

0 1 2 3 4 5km

PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE : AIR MONITORING LOCATIONS MAP

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/460-483	Date of Report	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A1, Near Mine Working Area

Sampling Date	Date of Sample Registration	Parameter	PM10 µg/m3	PM2-5 µg/m3	SO2 µg/m3	NOX µg/m3	CO mg/m3	Hydro-Carbon
		Limit	100 (µg/m3)	60 (µg/m3)	80 (µg/m3)	80 (µg/m3)	04 (mg/m3)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method	GC Method
December - 2019								
02.12.2019	04.12.2019	Week-1	51.2	17.3	09.2	13.5	0.06	0.04
03.12.2019	04.12.2019	Week-1	57.5	19.1	10.8	17.5	0.05	0.03
09.12.2019	11.12.2019	Week-2	55.4	21.0	12.5	14.8	0.02	0.05
10.12.2019	11.12.2019	Week-2	56.7	18.1	10.8	16.6	0.04	0.03
16.12.2019	18.12.2019	Week-3	54.7	19.6	11.3	19.2	0.06	0.04
17.12.2019	18.12.2019	Week-3	57.7	17.7	12.2	19.4	0.08	0.02
23.12.2019	25.12.2019	Week-4	54.4	21.1	13.2	20.8	0.09	0.03
24.12.2019	25.12.2019	Week-4	53.9	18.8	10.9	16.9	0.07	0.04
January – 2020								
06.01.2020	08.01.2020	Week-2	54.2	20.2	08.1	17.0	0.05	0.04
07.01.2020	08.01.2020	Week-2	54.4	18.8	09.7	20.3	0.04	0.02
13.01.2020	15.01.2020	Week-3	57.7	17.1	09.8	15.8	0.03	0.05
14.01.2020	15.01.2020	Week-3	56.5	16.9	13.5	16.1	0.06	0.04
20.01.2020	22.01.2020	Week-4	55.2	20.5	10.8	18.4	0.02	0.02
21.01.2020	22.01.2020	Week-4	61.2	19.4	11.0	15.7	0.01	0.04
27.01.2020	29.01.2020	Week-5	60.9	20.5	10.5	14.6	0.05	0.02
28.01.2020	29.01.2020	Week-5	59.6	21.0	09.7	15.3	0.06	0.03
February – 2020								
03.02.2020	05.02.2020	Week-1	53.6	17.7	11.8	18.8	0.08	0.04
04.02.2020	05.02.2020	Week-1	57.3	16.9	12.4	18.5	0.07	0.05
10.02.2020	12.02.2020	Week-2	62.2	19.8	14.3	19.4	0.09	0.05
11.02.2020	12.02.2020	Week-2	51.7	20.1	12.7	20.9	0.04	0.03
17.02.2020	19.02.2020	Week-3	57.8	20.4	15.5	21.7	0.06	0.05
18.02.2020	19.02.2020	Week-3	56.5	22.1	14.6	18.1	0.05	0.04
24.02.2020	26.02.2020	Week-4	55.2	20.6	13.7	18.6	0.03	0.05
25.02.2020	26.02.2020	Week-4	55.1	19.5	14.1	19.3	0.09	0.02

Remark: All Parameters are within NAAQS Standards.
N.S.-Not Specified

Lab Chemist

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/484-507	**Date of Report**	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A2, Near Dump Site

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_x µg/m^3	CO mg/m^3	Hydro-Carbon
		Limit	100 (µg/m^3)	60 (µg/m^3)	80 (µg/m^3)	80 (µg/m^3)	04 (mg/m^3)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
02.12.2019	04.12.2019	Week-1	51.7	17.6	14.2	18.9	0.05	0.04
03.12.2019	04.12.2019	Week-1	57.4	18.4	13.8	16.4	0.08	0.05
09.12.2019	11.12.2019	Week-2	61.2	18.2	14.9	17.8	0.03	0.02
10.12.2019	11.12.2019	Week-2	58.8	16.7	15.5	20.5	0.08	0.05
16.12.2019	18.12.2019	Week-3	52.5	15.6	14.2	19.6	0.05	0.02
17.12.2019	18.12.2019	Week-3	53.2	18.8	16.1	20.7	0.04	0.02
23.12.2019	25.12.2019	Week-4	57.8	17.4	14.0	19.9	0.03	0.01
24.12.2019	25.12.2019	Week-4	54.5	19.5	15.5	20.0	0.06	0.05
January – 2020								
06.01.2020	08.01.2020	Week-2	52.1	18.8	14.1	18.8	0.04	0.05
07.01.2020	08.01.2020	Week-2	54.5	19.6	12.7	16.1	0.03	0.03
13.01.2020	15.01.2020	Week-3	57.2	17.8	14.5	18.6	0.02	0.04
14.01.2020	15.01.2020	Week-3	56.1	20.1	15.1	19.5	0.06	0.05
20.01.2020	22.01.2020	Week-4	53.5	19.5	13.9	20.7	0.08	0.05
21.01.2020	22.01.2020	Week-4	51.6	17.5	17.2	21.5	0.09	0.05
27.01.2020	29.01.2020	Week-5	54.3	18.4	15.3	19.9	0.07	0.05
28.01.2020	29.01.2020	Week-5	53.0	19.7	14.7	18.4	0.06	0.02
February – 2020								
03.02.2020	05.02.2020	Week-1	54.3	17.6	14.5	19.6	0.08	0.05
04.02.2020	05.02.2020	Week-1	52.8	18.5	15.3	21.1	0.05	0.03
10.02.2020	12.02.2020	Week-2	54.2	16.8	12.7	18.8	0.04	0.04
11.02.2020	12.02.2020	Week-2	53.3	19.6	14.3	20.8	0.06	0.02
17.02.2020	19.02.2020	Week-3	52.6	21.1	13.8	19.6	0.01	0.05
18.02.2020	19.02.2020	Week-3	51.3	17.8	14.3	21.4	0.05	0.03
24.02.2020	26.02.2020	Week-4	54.1	19.6	15.2	21.0	0.05	0.05
25.02.2020	26.02.2020	Week-4	57.4	20.4	14.1	20.5	0.06	0.05

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/508-531	Date of Report	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A3, Near Haulage Road

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_x µg/m^3	CO mg/m^3	Hydro-Carbon
		Limit	100 (µg/m^3)	60 (µg/m^3)	80 (µg/m^3)	80 (µg/m^3)	04 (mg/m^3)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
02.12.2019	04.12.2019	Week-1	51.8	18.7	12.7	19.5	0.06	0.05
03.12.2019	04.12.2019	Week-1	56.2	20.4	13.4	16.4	0.03	0.03
09.12.2019	11.12.2019	Week-2	58.5	17.8	15.1	20.1	0.04	0.01
10.12.2019	11.12.2019	Week-2	52.7	19.5	14.2	18.3	0.02	0.04
16.12.2019	18.12.2019	Week-3	55.3	20.6	12.5	19.5	0.05	0.04
17.12.2019	18.12.2019	Week-3	56.1	17.5	16.1	20.7	0.06	0.05
23.12.2019	25.12.2019	Week-4	54.5	19.1	13.9	21.8	0.07	0.03
24.12.2019	25.12.2019	Week-4	57.3	20.0	14.5	17.9	0.08	0.02
January – 2020								
06.01.2020	08.01.2020	Week-2	55.2	18.3	12.8	21.4	0.09	0.03
07.01.2020	08.01.2020	Week-2	52.8	20.4	14.2	18.8	0.08	0.05
13.01.2020	15.01.2020	Week-3	59.2	17.8	13.2	17.5	0.06	0.05
14.01.2020	15.01.2020	Week-3	52.1	18.5	14.3	19.9	0.04	0.03
20.01.2020	22.01.2020	Week-4	51.7	20.8	14.4	17.5	0.05	0.05
21.01.2020	22.01.2020	Week-4	54.5	17.7	15.0	20.2	0.07	0.02
27.01.2020	29.01.2020	Week-5	55.1	20.0	13.7	21.0	0.08	0.03
28.01.2020	29.01.2020	Week-5	56.7	19.5	14.6	19.4	0.05	0.01
February – 2020								
03.02.2020	05.02.2020	Week-1	55.1	18.3	15.5	18.6	0.06	0.03
04.02.2020	05.02.2020	Week-1	56.4	17.4	17.0	21.0	0.04	0.05
10.02.2020	12.02.2020	Week-2	57.2	20.8	13.6	18.2	0.05	0.02
11.02.2020	12.02.2020	Week-2	54.5	17.4	14.2	17.8	0.03	0.04
17.02.2020	19.02.2020	Week-3	54.4	18.8	15.3	16.5	0.07	0.05
18.02.2020	19.02.2020	Week-3	54.3	20.0	13.2	19.7	0.08	0.05
24.02.2020	26.02.2020	Week-4	51.8	18.8	12.4	20.4	0.05	0.04
25.02.2020	26.02.2020	Week-4	57.6	20.5	15.5	19.6	0.09	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/532-555	**Date of Report**	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A4, Near Mines Office /DG Set

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
04.12.2019	06.12.2019	Week-1	57.4	17.2	14.2	17.6	0.07	0.05
05.12.2019	06.12.2019	Week-1	55.5	16.8	12.6	19.2	0.06	0.02
11.12.2019	13.12.2019	Week-2	54.2	19.5	14.6	21.0	0.04	0.03
12.12.2019	13.12.2019	Week-2	57.7	18.7	15.7	19.8	0.05	0.03
18.12.2019	20.12.2019	Week-3	52.9	16.3	15.1	17.7	0.03	0.05
19.12.2019	20.12.2019	Week-3	54.2	18.7	16.4	18.5	0.02	0.05
25.12.2019	27.12.2019	Week-4	56.3	16.5	14.2	19.3	0.05	0.03
26.12.2019	27.12.2019	Week-4	57.1	17.6	15.6	21.6	0.09	0.02
January – 2020								
08.01.2020	10.01.2020	Week-2	55.2	18.2	15.4	18.9	0.05	0.04
09.01.2020	10.01.2020	Week-2	57.5	19.6	13.6	21.5	0.04	0.05
15.01.2020	17.01.2020	Week-3	52.8	18.8	16.3	20.8	0.03	0.05
16.01.2020	17.01.2020	Week-3	54.2	17.6	12.1	19.7	0.03	0.03
22.01.2020	24.01.2020	Week-4	53.6	18.5	13.4	17.6	0.06	0.03
23.01.2020	24.01.2020	Week-4	56.2	18.4	14.5	19.5	0.04	0.03
29.01.2020	31.01.2020	Week-5	56.1	20.1	16.6	15.2	0.05	0.05
30.01.2020	31.01.2020	Week-5	52.5	17.8	17.6	19.4	0.07	0.05
February – 2020								
05.02.2020	07.02.2020	Week-1	57.4	17.5	12.0	18.2	0.06	0.05
06.02.2020	07.02.2020	Week-1	55.7	16.8	16.5	17.7	0.04	0.04
12.02.2020	14.02.2020	Week-2	54.3	18.6	17.1	19.6	0.05	0.05
13.02.2020	14.02.2020	Week-2	53.5	19.0	14.4	18.1	0.02	0.03
19.02.2020	21.02.2020	Week-3	55.9	17.7	15.4	19.5	0.03	0.02
20.02.2020	21.02.2020	Week-3	52.2	18.4	16.2	21.3	0.04	0.05
26.02.2020	28.02.2020	Week-4	53.8	17.9	14.6	20.1	0.06	0.04
27.02.2020	28.02.2020	Week-4	56.6	18.4	15.5	19.0	0.01	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

GREEN ENVIROSAFE
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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/556-579	**Date of Report**	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A 5, Dhangarwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_x µg/m^3	CO mg/m^3	Hydro-Carbon
		Limit	100 (µg/m^3)	60 (µg/m^3)	80 (µg/m^3)	80 (µg/m^3)	04 (mg/m^3)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
04.12.2019	06.12.2019	Week-1	45.8	14.4	11.5	15.1	0.06	0.03
05.12.2019	06.12.2019	Week-1	47.2	15.0	12.8	16.8	0.08	0.05
11.12.2019	13.12.2019	Week-2	44.8	14.8	10.4	17.7	0.03	0.03
12.12.2019	13.12.2019	Week-2	48.1	14.8	11.2	18.0	0.04	0.01
18.12.2019	20.12.2019	Week-3	47.2	15.3	10.4	14.6	0.06	0.04
19.12.2019	20.12.2019	Week-3	47.7	16.5	12.8	17.5	0.07	0.03
25.12.2019	27.12.2019	Week-4	45.5	13.6	09.6	15.4	0.08	0.02
26.12.2019	27.12.2019	Week-4	46.4	14.2	12.5	17.9	0.05	0.03
January – 2020								
08.01.2020	10.01.2020	Week-2	45.2	12.6	11.4	14.6	0.04	0.04
09.01.2020	10.01.2020	Week-2	45.8	13.4	12.3	16.7	0.08	0.02
15.01.2020	17.01.2020	Week-3	46.7	14.8	13.3	17.1	0.06	0.04
16.01.2020	17.01.2020	Week-3	47.4	15.4	10.5	14.8	0.04	0.05
22.01.2020	24.01.2020	Week-4	45.4	14.0	15.7	13.3	0.09	0.05
23.01.2020	24.01.2020	Week-4	46.2	13.5	13.0	16.5	0.02	0.03
29.01.2020	31.01.2020	Week-5	46.4	14.9	10.4	14.5	0.05	0.03
30.01.2020	31.01.2020	Week-5	46.2	15.7	12.5	16.3	0.09	0.02
February – 2020								
05.02.2020	07.02.2020	Week-1	46.7	13.6	10.6	15.8	0.08	0.02
06.02.2020	07.02.2020	Week-1	45.5	12.8	12.3	13.1	0.04	0.04
12.02.2020	14.02.2020	Week-2	47.3	14.1	13.5	12.5	0.03	0.05
13.02.2020	14.02.2020	Week-2	43.3	11.7	10.5	14.7	0.05	0.03
19.02.2020	21.02.2020	Week-3	44.5	12.6	12.1	15.5	0.02	0.03
20.02.2020	21.02.2020	Week-3	45.6	15.4	11.4	12.6	0.06	0.02
26.02.2020	28.02.2020	Week-4	46.8	14.5	11.6	14.9	0.04	0.05
27.02.2020	28.02.2020	Week-4	43.3	13.9	10.3	15.3	0.03	0.01

Remark: All Parameters are within NAAQS Standards.
N.S- Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/580-603	Date of Report	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A6, Thanewadi Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
04.12.2019	06.12.2019	Week-1	44.8	11.6	11.5	13.8	0.05	0.03
05.12.2019	06.12.2019	Week-1	49.1	13.8	13.2	15.1	0.04	0.04
11.12.2019	13.12.2019	Week-2	47.5	12.5	10.5	13.6	0.09	0.02
12.12.2019	13.12.2019	Week-2	48.1	15.4	12.1	14.4	0.06	0.03
18.12.2019	20.12.2019	Week-3	46.5	13.7	11.4	15.8	0.04	0.04
19.12.2019	20.12.2019	Week-3	45.6	14.6	13.1	17.5	0.02	0.02
25.12.2019	27.12.2019	Week-4	45.3	13.8	12.4	15.3	0.06	0.01
26.12.2019	27.12.2019	Week-4	48.6	15.0	11.6	13.7	0.03	0.03
January – 2020								
08.01.2020	10.01.2020	Week-2	46.4	14.1	11.3	13.8	0.04	0.03
09.01.2020	10.01.2020	Week-2	43.3	16.6	13.2	14.3	0.02	0.02
15.01.2020	17.01.2020	Week-3	45.5	12.7	10.4	17.4	0.06	0.04
16.01.2020	17.01.2020	Week-3	44.9	13.3	09.9	15.6	0.04	0.03
22.01.2020	24.01.2020	Week-4	45.8	14.0	11.4	16.1	0.07	0.02
23.01.2020	24.01.2020	Week-4	44.4	13.8	10.2	16.3	0.03	0.01
29.01.2020	31.01.2020	Week-5	45.5	12.5	13.3	19.5	0.06	0.02
30.01.2020	31.01.2020	Week-5	46.5	13.6	12.6	16.7	0.04	0.04
February – 2020								
05.02.2020	07.02.2020	Week-1	44.4	12.7	11.0	15.1	0.05	0.02
06.02.2020	07.02.2020	Week-1	46.2	11.9	13.2	16.5	0.09	0.04
12.02.2020	14.02.2020	Week-2	47.2	13.5	10.4	16.7	0.08	0.03
13.02.2020	14.02.2020	Week-2	46.6	13.8	13.0	17.9	0.02	0.05
19.02.2020	21.02.2020	Week-3	46.4	14.5	11.2	13.7	0.04	0.02
20.02.2020	21.02.2020	Week-3	45.5	15.4	10.4	14.8	0.06	0.03
26.02.2020	28.02.2020	Week-4	46.3	12.4	10.8	15.0	0.08	0.04
27.02.2020	28.02.2020	Week-4	44.9	12.1	11.5	16.6	0.05	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

GESEC

Ambient Air Quality Monitoring Report

Report No-	**GESEC/PRO/2019-20/03/604-627**	**Date of Report**	**11/03/2020**
Name of Client	**Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra**		
Project Name & Address	**M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra**		
Sample Collected and Analyzed by	**Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-**		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A7, Pandarpaniwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_x µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
06.12.2019	09.12.2019	Week-1	44.8	12.8	11.4	16.6	0.06	0.02
07.12.2019	09.12.2019	Week-1	47.1	12.6	10.1	15.3	0.04	0.05
13.12.2019	16.12.2019	Week-2	46.3	14.1	13.3	17.7	0.02	0.03
14.12.2019	16.12.2019	Week-2	44.6	12.5	10.5	15.1	0.04	0.02
20.12.2019	23.12.2019	Week-3	42.7	13.3	09.8	13.5	0.06	0.04
21.12.2019	23.12.2019	Week-3	45.8	13.5	11.0	15.4	0.05	0.02
27.12.2019	30.12.2019	Week-4	47.6	14.4	13.1	17.4	0.01	0.03
28.12.2019	30.12.2019	Week-4	45.1	12.4	10.5	15.2	0.02	0.04
January – 2020								
03.01.2020	06.01.2020	Week-1	44.4	14.2	12.4	16.2	0.06	0.02
04.01.2020	06.01.2020	Week-1	45.4	13.8	09.9	15.8	0.08	0.04
10.01.2020	13.01.2020	Week-2	47.0	14.4	13.5	17.6	0.05	0.03
11.01.2020	13.01.2020	Week-2	45.3	12.5	12.3	16.5	0.06	0.01
17.01.2020	20.01.2020	Week-3	46.1	13.7	11.8	15.5	0.04	0.03
18.01.2020	20.01.2020	Week-3	46.4	12.5	10.2	14.4	0.09	0.02
24.01.2020	27.01.2020	Week-4	44.3	13.4	10.2	13.5	0.04	0.02
25.01.2020	27.01.2020	Week-4	47.8	14.3	09.7	14.2	0.08	0.03
February – 2020								
07.02.2020	10.02.2020	Week-2	46.2	13.7	12.1	15.6	0.06	0.01
08.02.2020	17.02.2020	Week-2	45.4	15.8	09.3	13.4	0.05	0.03
14.02.2020	17.02.2020	Week-3	46.2	13.7	11.3	16.8	0.03	0.03
15.02.2020	17.02.2020	Week-3	47.2	16.1	12.6	18.5	0.04	0.04
21.02.2020	24.02.2020	Week-4	44.5	15.6	10.2	15.5	0.05	0.05
22.02.2020	24.02.2020	Week-4	45.1	12.8	12.4	16.7	0.06	0.02
28.02.2020	02.03.2020	Week-5	43.3	13.4	13.3	15.2	0.01	0.02
29.02.2020	02.03.2020	Week-5	45.5	14.9	11.4	16.3	0.02	0.03

Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

GESEC

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/628-651	Date of Report	11/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A 8, Gajapur Village

Sampling Date	Date of Sample Registration	Parameter	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	SO_2 µg/m³	NO_X µg/m³	CO mg/m³	Hydro-Carbon
		Limit	100 (µg/m³)	60 (µg/m³)	80 (µg/m³)	80 (µg/m³)	04 (mg/m³)	N.S (µg/m3)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	(Modified West & Gaeke Method)	(Jacob & Hocheiser's Method)	NDIR Method	GC Method
December - 2019								
06.12.2019	09.12.2019	Week-1	44.7	13.6	11.3	15.5	0.05	0.03
07.12.2019	09.12.2019	Week-1	46.2	14.4	12.6	14.7	0.03	0.01
13.12.2019	16.12.2019	Week-2	45.3	12.5	10.5	16.4	0.04	0.04
14.12.2019	16.12.2019	Week-2	46.8	14.5	09.4	15.8	0.06	0.03
20.12.2019	23.12.2019	Week-3	47.5	12.6	13.1	17.4	0.03	0.02
21.12.2019	23.12.2019	Week-3	46.1	14.0	11.8	17.0	0.04	0.02
27.12.2019	30.12.2019	Week-4	45.1	15.1	13.3	18.3	0.06	0.03
28.12.2019	30.12.2019	Week-4	47.5	13.7	10.2	19.6	0.04	0.01
January – 2020								
03.01.2020	06.01.2020	Week-1	43.4	14.3	11.5	13.3	0.04	0.02
04.01.2020	06.01.2020	Week-1	46.3	12.5	12.1	14.6	0.03	0.03
10.01.2020	13.01.2020	Week-2	45.1	12.8	10.6	11.8	0.05	0.01
11.01.2020	13.01.2020	Week-2	44.4	13.2	12.2	17.4	0.06	0.04
17.01.2020	20.01.2020	Week-3	46.5	12.5	11.5	15.5	0.07	0.03
18.01.2020	20.01.2020	Week-3	47.5	13.7	12.3	12.4	0.03	0.02
24.01.2020	27.01.2020	Week-4	45.2	14.1	11.9	16.9	0.06	0.02
25.01.2020	27.01.2020	Week-4	47.4	12.4	12.5	16.0	0.04	0.03
February – 2020								
07.02.2020	10.02.2020	Week-2	46.6	13.6	09.8	13.8	0.04	0.02
08.02.2020	17.02.2020	Week-2	47.4	12.8	13.2	15.1	0.03	0.03
14.02.2020	17.02.2020	Week-3	51.1	14.2	10.6	16.5	0.05	0.04
15.02.2020	17.02.2020	Week-3	46.3	12.4	12.3	17.5	0.04	0.03
21.02.2020	24.02.2020	Week-4	48.5	12.6	10.4	15.6	0.05	0.02
22.02.2020	24.02.2020	Week-4	44.1	13.4	11.4	16.5	0.03	0.04
28.02.2020	02.03.2020	Week-5	46.3	15.8	10.8	14.7	0.06	0.04
29.02.2020	02.03.2020	Week-5	45.5	12.5	12.7	15.4	0.09	0.05

Remark: All Parameters are within NAAQS Standards.
N.S- Not Specified

Lab Chemist

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

Authorized Signatory

Summary of Ambient Air Quality

S. No.	Location		PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	CO (mg/m^3)	HC ($\mu g/m^3$)
1	Near Mine Working Area	Min	51.20	16.90	08.10	13.50	0.01	0.02
		Max	62.20	22.10	15.50	21.70	0.09	0.05
		Mean	56.28	19.34	11.80	17.80	0.05	0.04
		10th percentile	53.69	17.16	09.70	14.95	0.02	0.02
		30th percentile	54.67	18.73	10.80	16.55	0.04	0.03
		50th percentile	55.95	19.55	11.55	18.25	0.06	0.04
		95th percentile	61.16	21.09	14.56	20.89	0.09	0.05
		98th percentile	61.74	21.64	15.09	21.33	0.09	0.05
2	Near Dump Site	Min	51.30	15.60	12.70	16.10	0.01	0.01
		Max	61.20	21.10	17.20	21.50	0.09	0.05
		Mean	54.56	18.54	14.58	19.59	0.05	0.04
		10th percentile	51.82	16.98	13.80	17.98	0.03	0.02
		30th percentile	52.18	17.78	14.10	18.89	0.04	0.03
		50th percentile	54.15	18.45	14.40	19.75	0.05	0.05
		95th percentile	58.65	20.36	16.01	21.36	0.08	0.05
		98th percentile	60.10	20.78	16.69	21.45	0.09	0.05
3	Near Haulage Road	Min	51.70	17.40	12.40	16.40	0.02	0.01
		Max	59.20	20.80	17.00	21.80	0.09	0.05
		Mean	55.04	19.11	14.22	19.24	0.06	0.04
		10th percentile	51.89	17.56	12.73	17.50	0.03	0.02
		30th percentile	54.39	18.30	13.58	18.29	0.05	0.03
		50th percentile	55.10	18.95	14.20	19.50	0.06	0.04
		95th percentile	58.37	20.77	16.01	21.34	0.09	0.05
		98th percentile	58.88	20.80	16.59	21.62	0.09	0.05
4	Near Mines Office /DG Set	Min	52.20	16.30	12.00	15.20	0.01	0.02
		Max	57.70	20.10	17.60	21.60	0.09	0.05
		Mean	55.12	18.11	14.98	19.20	0.05	0.04
		10th percentile	52.83	16.80	12.84	17.63	0.02	0.02
		30th percentile	54.16	17.60	14.38	18.47	0.04	0.03
		50th percentile	55.35	18.30	15.25	19.35	0.05	0.04
		95th percentile	57.49	19.59	17.03	21.47	0.07	0.05
		98th percentile	57.61	19.87	17.37	21.55	0.08	0.05
5	Dhangarwadi Village	Min	43.30	11.70	09.60	12.50	0.02	0.01
		Max	48.10	16.50	15.70	18.00	0.09	0.05
		Mean	46.04	14.23	11.78	15.47	0.05	0.03
		10th percentile	44.59	12.66	10.40	13.16	0.03	0.02
		30th percentile	45.50	13.60	10.59	14.69	0.04	0.03
		50th percentile	46.20	14.30	11.55	15.35	0.05	0.03
		95th percentile	47.66	15.66	13.47	17.87	0.09	0.05
		98th percentile	47.92	16.13	14.69	17.95	0.09	0.05
6	Thanewadi	Min	43.30	11.60	09.90	13.60	0.02	0.01

	Village	Max	49.10	16.60	13.30	19.50	0.09	0.05
		Mean	46.05	13.64	11.65	15.63	0.05	0.03
		10th percentile	44.52	12.19	10.40	13.73	0.02	0.02
		30th percentile	45.48	12.70	10.98	14.76	0.04	0.02
		50th percentile	46.00	13.75	11.45	15.45	0.05	0.03
		95th percentile	48.53	15.40	13.20	17.84	0.09	0.04
		98th percentile	48.87	16.05	13.25	18.76	0.09	0.05
7	Pandapniwadi Village	Min	42.70	12.40	09.30	13.40	0.01	0.01
		Max	47.80	16.10	13.50	18.50	0.09	0.05
		Mean	45.59	13.77	11.35	15.75	0.05	0.03
		10th percentile	44.33	12.50	09.83	13.71	0.02	0.02
		30th percentile	45.07	13.25	10.20	15.20	0.04	0.02
		50th percentile	45.45	13.70	11.35	15.55	0.05	0.03
		95th percentile	47.54	15.77	13.30	17.69	0.08	0.05
		98th percentile	47.71	15.96	13.41	18.13	0.09	0.05
8	Gajapur Village	Min	44.10	12.40	09.40	13.80	0.03	0.01
		Max	51.10	15.80	13.30	19.60	0.09	0.05
		Mean	46.70	13.54	11.44	16.04	0.05	0.03
		10th percentile	44.82	12.50	09.92	14.70	0.03	0.02
		30th percentile	46.04	12.60	10.59	15.37	0.04	0.02
		50th percentile	46.30	13.50	11.35	15.70	0.04	0.03
		95th percentile	50.71	15.70	13.20	18.18	0.09	0.05
		98th percentile	51.10	15.80	13.25	19.00	0.09	0.05

Remark:

All the obtained air quality values in core zone and buffer zone as compared with the air quality standards prescribed by Central Pollution Control Board 2009 are found to be within the limit.

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CIN No. : U74900PN2013PTC149666

Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Stack Analysis Report

Report No.	**GESEC/PRO/2019-20/03/670**	**Date of Report**	**11/03/2020**
Name of Client	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**		
Project Name and Address	**M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.**		
Sample Collected By	**Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.**		
Date of Sampling	**16/12/2019**		

Name of Instrument & Calibration Details	**Date of calibration**	**Calibration Due Date**	**Calibration Certificate No.**
Stack Monitoring Kit	**22/11/2019**	**21/11/2020**	**POLLTECH/F/SMS/11-19/119**
Analysis Method	**Emission testing Methodology for Air Pollution-EPA**		

Stack Details

Stack –attached to	DG (45 KVA) [-II-]	I.D. of stack at port (m)D	0.10
Crossection of the stack	Round	Stack crossectional area (m^2)	0.0079
Height of stack above ground (m)	5.50	Consumption of fuel (l/hr)	3.00
Fuel used	HSD	Load on the system	Approx.90%

Emission details

Sr. No.	Particulars	Value
1	Temperature (°C)	125.00
2	Differential Pressure	0.60
3	Velocity of the gas (m/sec)	2.95
4	Gas flow rate at NTP (Nm^3/hr)	61.80
5	Particulate matter	24.70
6	SO_2 (Kg/Hr)	0.0053

ANALYZED BY-

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

AUTHORIZED SIGNATORY-

Terms and conditions

1. The report is refer only to the sample tested and not applies to the bulk.
2. The results shown in this test report may differ based on various factors including temperature, humidity, pressure, retention time etc.
3. The test report cannot be reproduced wholly or in part and cannot be used for promotional or publicity purpose without the written consent of laboratory, GESEC.
4. Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer.
5. We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement
6. MoEF approved Lab by Govt. of India. From date 09/02/2017 to 08/02/2022.

Stack Analysis Report				
Stack Details				
Stack –attached to	DG (45 KVA) [-II-]		I.D. of stack at port (m)D	0.10
Crossection of the stack	Round		Stack crossectional area	0.0079
Height of stack above ground	5.50		Consumption of fuel (l/hr)	3.0
Fuel used	HSD		Load on the system	Approx.90%

Emission details		
Sr. No.	**Particulars**	**Value**
1	Temperature (°C)	125.00
2	Differential Pressure	0.60
3	Velocity of the gas (m/sec)	2.95
4	Gas flow rate at NTP (Nm^3/hr)	61.80
5	Particulate matter	24.70
6	SO_2 (Kg/Hr)	0.0053

Remark:

The obtained stack monitoring results as compared with the values standards prescribed in consents given by Maharshtra Pollution Control Board 2009 are found to be within the limit.

AMBIENT NOISE LEVEL QUALITY

Noise is nothing but unwanted sound produced due to various activities. As a part of occupational health and safety measures, certain safeguards have been incorporated to mitigate noise pollution in working environment. Noise pollution survey has been carried out in the study area to assess the impacts of the mining activities. So noise level surveys were carried out at 8 selected locations in and around the mine lease area. Noise survey has been conducted in the study area for the period of 24 hr at each location.

AMBIENT NOISE LEVEL MONITORING STATIONS

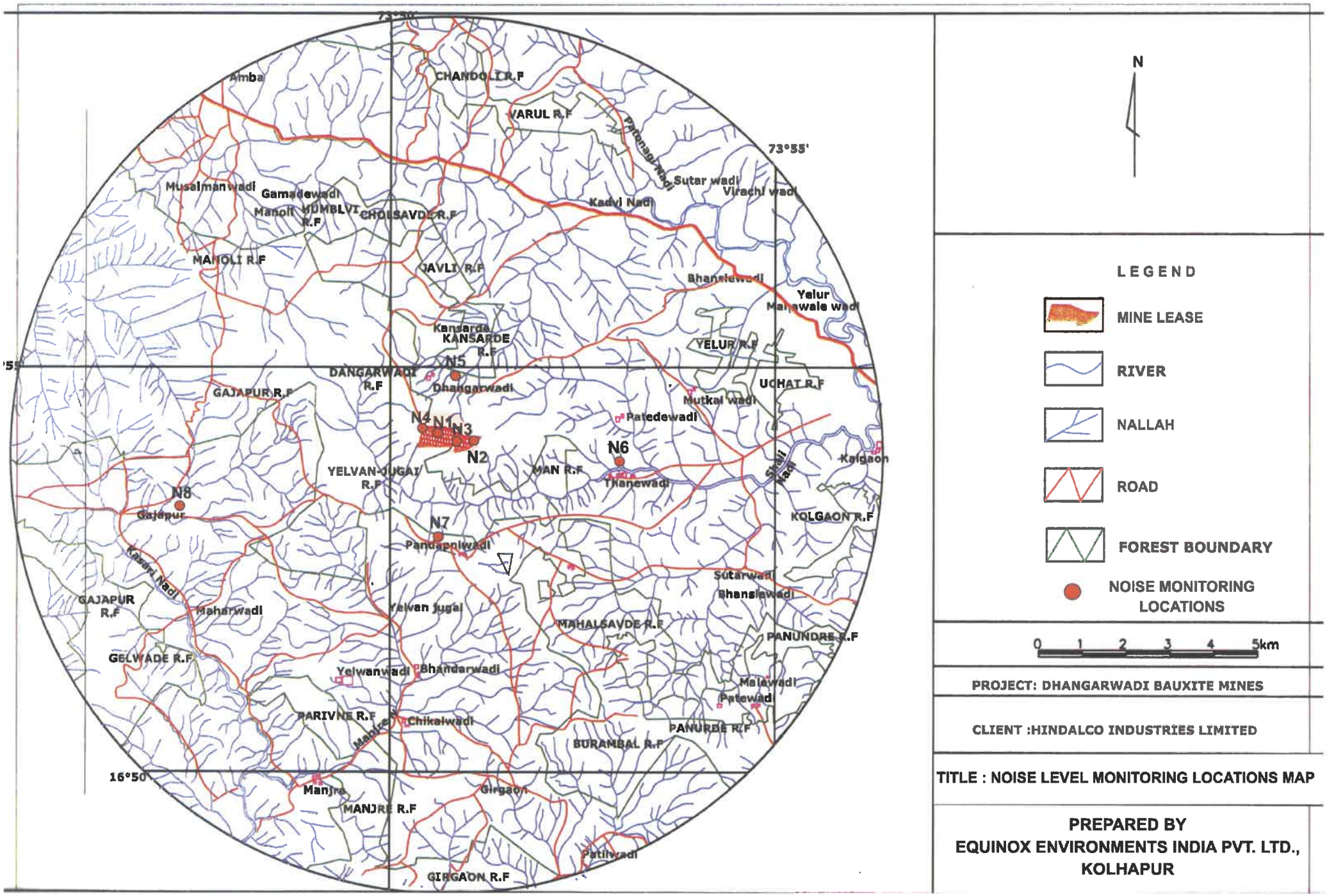
Sl. No.	Station Code	Name Of The Sampling Station	Direction W.R.T. Mines Lease Area
1	A-1	Near Mine Working Area	- - -
2	A-2	Near Dump Site	- - -
3	A-3	Near Haulage Road	- - -
4	A-4	Near Mines Office /DG Set	- - -
5	A-5	Dhangarwadi Village	N
6	A-6	Thanewadi Village	ESW
7	A-7	Pandapniwadi Village	S
8	A-8	Gajapur Village	WSW

NATIONAL AMBIENT NOISE QUALITY STANDARDS

AREA CODE	CATEGORY OF AREA	LIMIT IN dB (A) Leq	
		DAY TIME	NIGHT TIME
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6 am and 9 pm.
2. Night time is reckoned in between 9 pm and 6 am.
3. Silence zone is defined as area up to 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.



N

LEGEND

MINE LEASE

RIVER

NALLAH

ROAD

FOREST BOUNDARY

NOISE MONITORING LOCATIONS

0 1 2 3 4 5km

PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE : NOISE LEVEL MONITORING LOCATIONS MAP

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR

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CIN No. : U74900PN2013PTC149666

Ambient Noise Monitoring Report

Report No.	GESEC/PRO/2019-20/03/652-659	**Date of Report**	11/03/2020
Name of Client	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		
Project Name and Address	M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.		
Sample Collected By	Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.		
Date of Sampling	December-2019		
Name of Instrument & Calibration Details	**Date of calibration**	**Calibration Due Date**	**Calibration Certificate No.**
Sound Level meter	01/06/2019	31/05/2020	TECH/CAL/2019/671/16
Analysis Method	IS: 4758-1968 Reaff.2002.		

Date	02/12/2019	04/12/2019	06/12/2019	09/12/2019	11/12/2019	13/12/2019	16/12/2019	18/12/2019
Location	Near Mine Working Area	Near Dump Site	Near Haulage Road	Near Mines Office /DG Set	Dhangarwadi Village	Thanewadi Village	Pandapniwadi Village	Gajapur Village
Time	N1	N2	N3	N4	N5	N6	N7	N8
6.00	51.3	55.4	52.8	50.5	49.2	49.9	50.4	51.7
7.00	58.4	56.4	58.3	55.6	46.2	46.9	47.2	48.3
8.00	60.0	58.3	60.0	57.7	47.1	48.4	48.7	49.5
9.00	61.9	60.5	59.2	53.6	48.5	47.1	47.8	48.6
10.00	61.9	62.3	60.9	55.6	49.4	49.4	51.1	51.0
11.00	62.4	62.8	61.9	56.4	50.4	49.5	47.5	48.8
12.00	63.6	57.3	62.4	58.3	50.0	49.8	48.4	48.6
13.00	61.8	62.3	60.7	56.1	50.2	49.7	48.4	48.4
14.00	61.8	61.9	60.2	55.6	50.7	50.8	48.5	50.4
15.00	60.1	60.7	58.6	53.9	49.9	49.0	46.5	48.1
16.00	58.5	59.3	59.4	52.6	50.5	48.2	49.8	50.9
17.00	62.2	57.6	59.2	51.5	50.5	43.5	50.0	48.4
18.00	61.4	56.6	62.4	56.7	51.1	50.3	49.9	49.8
19.00	60.8	55.5	58.6	56.4	46.0	45.3	45.0	45.2
20.00	57.5	51.1	54.3	52.0	40.7	40.2	45.1	46.1
21.00	52.0	53.6	57.1	54.4	40.9	40.4	40.8	41.8
22.00	46.7	48.4	51.5	48.3	41.4	40.8	41.1	41.9
L10	**51.7**	**52.6**	**53.7**	**51.1**	**41.2**	**40.6**	**43.4**	**43.9**
L50	**60.8**	**57.6**	**59.2**	**55.6**	**49.4**	**48.4**	**48.4**	**48.6**
L90	**62.3**	**62.3**	**62.1**	**57.1**	**50.6**	**50.1**	**50.2**	**50.9**
Lday	**62.7**	**59.2**	**60.4**	**56.2**	**50.9**	**49.9**	**49.2**	**49.4**
23.00	47.8	45.5	48.9	48.6	39.6	39.9	38.6	39.8
24.00	47.5	45.9	49.2	48.8	39.4	39.5	38.6	39.8
1.00	47.7	45.9	49.5	49.2	39.9	38.9	37.9	39.0
2.00	48.6	46.1	50.2	49.5	39.3	38.7	39.2	38.8
3.00	48.6	46.8	50.7	49.9	39.2	38.7	40.2	39.7
4.00	44.5	42.5	45.9	45.6	40.7	40.1	40.5	39.1
5.00	44.0	41.9	45.8	45.4	39.8	40.7	41.4	38.6

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L10	44.3	42.3	45.9	45.5	39.3	38.7	38.3	38.7
L50	47.7	45.9	49.2	48.8	39.6	39.5	39.2	39.1
L90	48.6	46.4	50.4	49.7	40.2	40.3	40.9	39.8
Lnight	48.0	46.2	49.5	49.1	39.6	39.5	39.3	39.1
Ldn	61.4	58.3	60.1	57.5	50.4	49.8	49.2	49.3
Avg L10	48.0	47.4	49.8	48.3	40.2	39.7	40.9	41.3
Avg L 50	54.3	51.8	54.2	52.2	44.5	44.0	43.8	43.9
Avg L 90	55.4	54.3	56.3	53.4	45.4	45.2	45.5	45.4

Lab Chemist

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Authorized Signatory

AMBIENT NOISE LEVEL MONITORING RESULTS [Leq in dB(A)]

Date	02/12/2019	04/12/2019	06/12/2019	09/12/2019	11/12/2019	13/12/2019	16/12/2019	18/12/2019
Location	Near Mine Working Area	Near Dump Site	Near Haulage Road	Near Mines Office /DG Set	Dhangarwadi Village	Thanewadi Village	Pandapniwadi Village	Gajapur Village
L_{10}	51.7	52.6	53.7	51.1	41.2	40.6	43.4	43.9
L_{50}	60.8	57.6	59.2	55.6	49.4	48.4	48.4	48.6
L_{90}	62.3	62.3	62.1	57.1	50.6	50.1	50.2	50.9
L_{day}	62.7	59.2	60.4	56.2	50.9	49.9	49.2	49.4
L_{10}	44.3	42.3	45.9	45.5	39.3	38.7	38.3	38.7
L_{50}	47.7	45.9	49.2	48.8	39.6	39.5	39.2	39.1
L_{90}	48.6	46.4	50.4	49.7	40.2	40.3	40.9	39.8
L_{night}	48.0	46.2	49.5	49.1	39.6	39.5	39.3	39.1
L_{dn}	61.4	58.3	60.1	57.5	50.4	49.8	49.2	49.3
Avg L_{10}	48.0	47.4	49.8	48.3	40.2	39.7	40.9	41.3
Avg L_{50}	54.3	51.8	54.2	52.2	44.5	44.0	43.8	43.9
Avg L_{90}	55.4	54.3	56.3	53.4	45.4	45.2	45.5	45.4

Remark:

All the obtained noise level quality values in core zone and buffer zone as compared with the noise level standards prescribed by Central Pollution Control Board are found to be within the limit.

WATER QUALITY

Environmental quality monitoring at Dhangarwadi Bauxite Mine of M/s. Hindalco Industries Limited at Dhangarwadi village of Shahuwadi Tahsil, Kolhapur district, Maharashtra includes water monitoring of various environmental components viz. ground, surface and domestic waste water within core zone and buffer zone around the mine lease area.

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

- Surface water quality.
- Ground water quality.

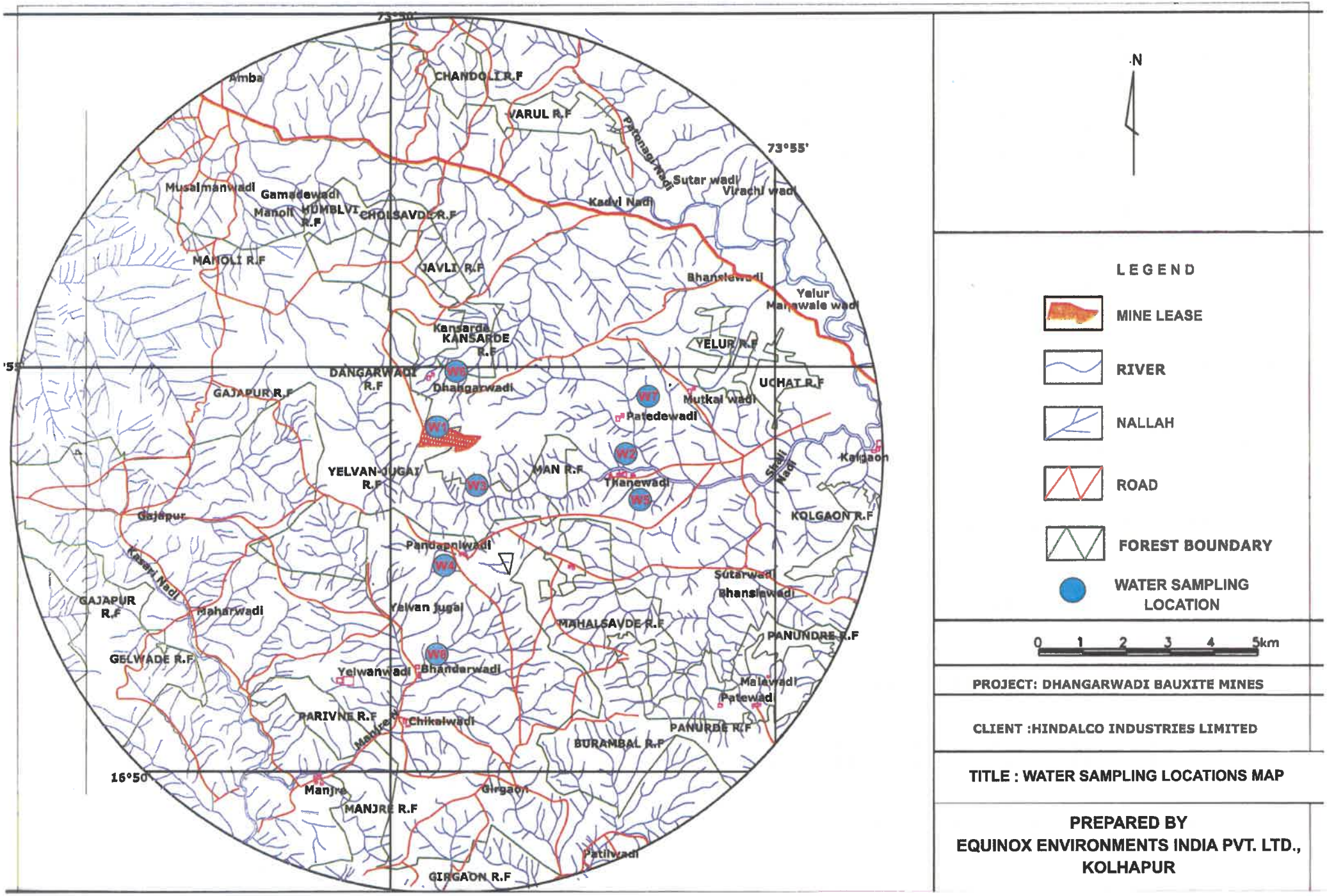
A total of 8 locations have selected, out of which 5 are for ground water and 3 are for surface water. Location of water quality monitoring stations is given below.

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. 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). Samples were collected in the winter season of the year 2019-20 as per the prescribed sample collecting methods and analyzed as per the IS standard procedures.

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



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE : WATER SAMPLING LOCATIONS MAP

PREPARED BY
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KOLHAPUR

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Surface Water Analysis Report

Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	**GESEC/PRO/2019-20/03/665-667**
Project Name and Address: M/s. Hindalco Industries Limited, Dhangarwadi Bauxite Mine, Dhangarwadi Village, Shahuwadi Taluka, Kolhapur District, Maharashtra.		**Date of Report**	**11/03/2020**
		Nature of sample	**Surface Water**
		Date of Sampling	**16/12/2019**
		Date of Sample Received	**17/12/2019**
Sample Collected & Analyzed By: Green Envirosafe Engineers & Consultant Pvt. Ltd., Pune, Maharashtra.		**Date of Sample Analysis**	**17/12/2019**

Sr. No.	Parameter	Unit(s)	Location		
			W1 Near Mine Office Borewell	W-2 Shali Nadi Up Stream	W-3 Shali Nadi Down Stream
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	7.79	7.66	7.85
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	4.15	4.74	4.0
7.	TDS	mg/lit	172.06	156.58	183.83
8.	TSS	mg/lit	16.02	11.90	18.51
9.	BOD:3 days at 27°C	mg/lit	4.43	3.34	5.15
10.	Alkalinity as $CaCO_3$	mg/lit	11.02	8.74	14.41
11.	Total Hardness as $CaCO_3$	mg/lit	62.15	48.23	71.88
12.	Nitrate as NO_3	mg/lit	12.74	10.52	15.70
13.	Phosphorous as PO_4	mg/lit	0.83	0.23	1.02
14.	Chlorides as Cl^-	mg/lit	20.17	16.83	24.70
15.	Sulphates as SO_4	mg/lit	1.56	0.35	1.94
16.	Sodium as Na	mg/lit	0.67	0.29	0.85
17.	Potassium as K	mg/lit	1.95	2.35	0.70
18.	Calcium as Ca	mg/lit	20.77	15.45	23.98
19.	Magnesium as Mg	mg/lit	4.09	3.84	4.77
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.07	0.03	0.11
27.	Fluorides as F^-	mg/lit	BDL	BDL	BDL
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL

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29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

BDL: Below Detectable Limit

ANALYZED BY

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

AUTHORIZED SIGNATORY

SURFACE WATER QUALITY

Sr. No.	Parameter	Unit (s)	Location		
			W-1 Mine Pit Water	W-2 Shali Nadi Up Stream	W-3 Shali Nadi Down Stream
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	7.79	7.66	7.85
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	4.15	4.74	4.0
7.	TDS	mg/lit	172.06	156.58	183.83
8.	TSS	mg/lit	16.02	11.90	18.51
9.	BOD:3 days at 27°C	mg/lit	4.43	3.34	5.15
10.	Alkalinity as $CaCO_3$	mg/lit	11.02	8.74	14.41
11.	Total Hardness as $CaCO_3$	mg/lit	62.15	48.23	71.88
12.	Nitrate as NO_3	mg/lit	12.74	10.52	15.70
13.	Phosphorous as PO_4	mg/lit	0.83	0.23	1.02
14.	Chlorides as Cl^-	mg/lit	20.17	16.83	24.70
15.	Sulphates as SO_4	mg/lit	1.56	0.35	1.94
16.	Sodium as Na	mg/lit	0.67	0.29	0.85
17.	Potassium as K	mg/lit	1.95	2.35	0.70
18.	Calcium as Ca	mg/lit	20.77	15.45	23.98
19.	Magnesium as Mg	mg/lit	4.09	3.84	4.77
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.07	0.03	0.11
27.	Fluorides as F^-	mg/lit	BDL	BDL	BDL
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

SURFACE WATER QUALITY

Proper drainage system has prepared to drag the monsoon water into the mine pit area for harvesting rain water and overflow of the same is being channelized through series of check dams and settling tanks so as to reduce the water pollution. Buffer zones have seasonal nallahs which used to recharge the ground water table. A total of 3 locations have selected of which 1 from core zone and 2 from buffer zone.

GROUND WATER QUALITY

The 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.

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 5 locations have selected from buffer zone.

DHANGARWADI MINES Well Depths of Villages			
S.No.	**Location**	**Total Depth in Meters**	**Water Level From Surface in Meters**
1	Pandapniwadi Village	6.00	1.24
2	Dhangarwadi Village	6.00	2.99

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DHANGARWADI MINES

WELL DEPTHS OF VILLAGES

DATE OF SAMPLING:16.12.2019

Report No: GESEC/PRO/2019-20/03/671-672

Sr. NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
1	PANDAPNIWADI VILLAGE	**DHANGARWADI**	6.00	1.24
2	DHANGARWADI VILLAGE	**DHANGARWADI**	6.00	2.99

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Ground Water Analysis Report

Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	**GESEC/PRO/2019-20/03/660-664**
Project Name and Address: M/s. Hindalco Industries Limited (Dhangarwadi Bauxite Mine) A/P. Dhangarwadi village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.		**Date of Report**	**11/03/2020**
		Nature of sample	**Ground water**
		Date of Sampling	**16/12/2019**
		Date of Sample Received	**17/12/2019**
		Date of Sample Analysis	**17/12/2019**

Sample Collected & Analyzed By : Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra

Sr. No.	Parameter	Unit(s)	Location: PANDAPNIWADI VILLAGE	THANEWADI VILLAGE	DHANGARWADI VILLAGE	PATEWADI VILLAGE	BHANDAR WADI VILLAGE
			W-4	W-5	W-6	W-7	W-8
1.	Odour	--	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Color	Hazen units	<5.00	<5.00	<5.00	<5.00	<5.00
4.	pH	--	7.88	7.61	7.63	7.68	7.71
5.	Turbidity	NTU	<5.00	<5.00	<5.00	<5.00	<5.00
6.	Dissolved Oxygen	mg/l	2.55	2.92	2.84	2.69	2.60
7.	Total Dissolved solids	mg/l	175.43	133.98	145.75	150.07	156.81
8.	Total Suspended solids	mg/l	7.98	5.74	6.10	6.33	6.47
9.	B.O.D	mg/l	5.11	3.69	3.94	4.78	4.93
10.	Alkalinity as $CaCO_3$	mg/l	15.03	7.46	9.03	11.48	12.84
11.	Total Hardness as $CaCO_3$	mg/l	84.85	44.47	60.23	67.87	73.71
12.	Nitrate as NO_3	mg/l	17.89	8.97	10.43	12.96	15.1
13.	Phosphates as PO_4	mg/l	0.96	0.51	0.65	0.78	0.88
14.	Chlorides as Cl	mg/l	49.86	25.68	29.01	35.49	41.72
15.	Sulphates as SO_4	mg/l	7.03	1.73	2.71	4.32	5.60
16.	Sodium as Na	mg/l	2.14	1.65	1.84	1.95	2.03
17.	Potassium as K	mg/l	6.07	3.11	3.20	3.48	5.44
18.	Calcium as Ca	mg/l	23.08	13.34	18.01	20.67	22.71
19.	Magnesium as Mg	mg/l	6.59	2.70	3.69	3.93	4.11
20.	Lead as Pb	mg/l	BDL	BDL	BDL	BDL	BDL
21.	Manganese as Mn	mg/l	BDL	BDL	BDL	BDL	BDL
22.	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL
23.	Chromium as Cr	mg/l	BDL	BDL	BDL	BDL	BDL
24.	Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL
25.	Zinc as Zn	mg/l	BDL	BDL	BDL	BDL	BDL
26.	Iron as Fe	mg/l	0.05	0.04	0.01	0.03	0.02
27.	Fluoride as F	mg/l	0.02	BDL	BDL	BDL	BDL
28.	Mercury as Hg	mg/l	BDL	BDL	BDL	BDL	BDL
29.	Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL
30.	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL
31.	Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL
32.	Boron as B	mg/l	BDL	BDL	BDL	BDL	BDL

BDL: Below Detectable Unit

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Sr. No.	Parameter	Unit (s)	Location				
			W-4 Pandapniwadi Village	W-5 Thanewadi Village	W-6 Dhangarwadi Village	W-7 Patewadi Village	W-8 Bhandar Wadi Village
1.	Odour	--	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Color	Hazen units	<5.00	<5.00	<5.00	<5.00	<5.00
4.	pH	--	7.88	7.61	7.63	7.68	7.71
5.	Turbidity	NTU	<5.00	<5.00	<5.00	<5.00	<5.00
6.	Dissolved Oxygen	mg/l	2.55	2.92	2.84	2.69	2.60
7.	Total Dissolved solids	mg/l	175.43	133.98	145.75	150.07	156.81
8.	Total Suspended solids	mg/l	7.98	5.74	6.10	6.33	6.47
9.	B.O.D	mg/l	5.11	3.69	3.94	4.78	4.93
10.	Alkalinity as $CaCO_3$	mg/l	15.03	7.46	9.03	11.48	12.84
11.	Total Hardness as $CaCO_3$	mg/l	84.85	44.47	60.23	67.87	73.71
12.	Nitrate as NO_3	mg/l	17.89	8.97	10.43	12.96	15.1
13.	Phosphates as PO_4	mg/l	0.96	0.51	0.65	0.78	0.88
14.	Chlorides as Cl	mg/l	49.86	25.68	29.01	35.49	41.72
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16.	Sodium as Na	mg/l	2.14	1.65	1.84	1.95	2.03
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19.	Magnesium as Mg	mg/l	6.59	2.70	3.69	3.93	4.11
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21.	Manganese as Mn	mg/l	BDL	BDL	BDL	BDL	BDL
22.	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL
23.	Chromium as Cr	mg/l	BDL	BDL	BDL	BDL	BDL
24.	Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL
25.	Zinc as Zn	mg/l	BDL	BDL	BDL	BDL	BDL
26.	Iron as Fe	mg/l	0.05	0.04	0.01	0.03	0.02
27.	Fluoride as F	mg/l	0.02	BDL	BDL	BDL	BDL
28.	Mercury as Hg	mg/l	BDL	BDL	BDL	BDL	BDL
29.	Selenium as Se	mg/l	BDL	BDL	BDL	BDL	BDL
30.	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL
31.	Cyanide as CN	mg/l	BDL	BDL	BDL	BDL	BDL
32.	Boron as B	mg/l	BDL	BDL	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

DOMESTIC EFFLUENT ANALYSIS

There is only source of waste water on site is canteen effluent. All the employees daily have their two meals in this canteen according to their shifts. Sample was collected two times from outlet and analyzed. Results are given below.

DOMESTIC EFFLUENT ANALYSIS

Sample Location: Canteen water waste

Date of Sampling: 16/12/2019

Sr. No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	45.12	100
2	mg/l	Total Dissolved Solids	802.31	2100
3	mg/l	COD	62.95	250
4	mg/l	BOD for 3 days at 27°C	25.74	100
5	mg/l	Total Solids	847.43	--
6	mg/l	Oil and Grease	<5.00	10

Sample location: Canteen water waste

Date of Sampling: 14/01/2020

Sr. No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	61.02	100
2	mg/l	Total Dissolved Solids	844.97	2100
3	mg/l	COD	69.32	250
4	mg/l	BOD for 3 days at 27°C	25.68	100
5	mg/l	Total Solids	905.99	--
6	mg/l	Oil and Grease	<5.00	10

Note:

- mg/l: milligram per liter

Remark:

All the parameters of the canteen waste water samples collected are well below the desirable standard prescribed in consent given by the Maharashtra Pollution Control Board.

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Domestic Effluent Analysis Report

Report No.	**GESEC/PRO/2019-20/03/668**	**Date of Report**	**11/03/2020**
Name of Client	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**		
Project Name and Address	**M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.**		
Sample Collected By	**Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.**		
Date of Sampling	**16/12/2019**		
Sample Location	**Canteen waste water**		
Analysis Method	**IS 3025 Method/APHA edition 2017**		

Domestic Effluent Analysis

Sl.No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	45.12	100
2	mg/l	Total Dissolved Solids	802.31	2100
3	mg/l	COD	62.95	250
4	mg/l	BOD for 3 days at 27°C	25.74	100
5	mg/l	Total Solids	847.43	------
6	mg/l	Oil and Grease	<5.00	10

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Domestic Effluent Analysis Report

Report No.	**GESEC/PRO/2019-20/03/669**	**Date of Report**	**11/03/2020**
Name of Client	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**		
Project Name and Address	**M/s. Hindalco Industries Limited, (Dhangarwadi Bauxite Mine), A/P. Dhangarwadi Village, Tahsil. Shahuwadi, District. Kolhapur, State. Maharashtra.**		
Sample Collected By	**Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.**		
Date of Sampling	**14/01/2020**		
Sample Location	**Canteen waste water**		
Analysis Method	**IS 3025 Method/APHA edition 2017**		

Domestic Effluent Analysis

Sl.No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	61.02	100
2	mg/l	Total Dissolved Solids	844.97	2100
3	mg/l	COD	69.32	250
4	mg/l	BOD for 3 days at 27°C	25.68	100
5	mg/l	Total Solids	905.99	------
6	mg/l	Oil and Grease	<5.00	10

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