ADITYA BIRLA

HINDALCO

The Additional PCCF,
Ministry of Environment, Forests & Climate Change
Regional office (West Central Zone),
Ground Floor, East Wing,
"New Secretary Building"
Civil lines, Nagpur - 440001

25/11/2021

Subject: Compliance Status of Environment Clearance No. J-11015/406/2006-IA.II (M) conditions for Dhangarwadi Bauxite Mines (M. L. Area 41.80 Ha.).

Dear Sir,

We have been granted Environment Clearance to our **Dhangarwadi Bauxite Mines** on 13th April 2007 vide clearance **No J-11015/406/2006-IA.II (M).**

Please be informed that, as of now mining operations have been stopped due to directions received from Ministry of Environment Forest & Climate Change on 14th February 2020. The copy of such letter is enclosed for your ready reference as Annexure - 1.

We are herewith submitting the compliance status against the conditions laid down in the Environment Clearance for period from **April'2021 to September'2021** along with environment monitoring reports attached as Annexure – 2.

Hope you will please find the above in order.

Thanking you,

Yours very truly,

Ramdas D. Patil
West Coast Mines
Hindalco Industries Limited

Encl. A/a
Copy to:
1. The Member Secretary,
Central Pollution Control Board,
Parivesh Bhavan, East Arjun Nagar,
DELHI - 110032

2. The Regional Officer
Maharashtra Pollution Control Board
Udyog Bhawan, KOLHAPUR.

ENVIRONMENT CLEARANCE COMPLIANCE STATUS

ENVIRONMENT CLEARANCE No. J-11015/406/2006-IA.II (M) dt. 13/04/2007

DHANGARWADI BAUXITE MINES

Sr. No.	CONDITIONS	COMPLIANCE
	A) Specific Conditions :-	
i)	Top soil to be stacked properly with proper slope with adequate safeguards and to be backfilled for reclamation and rehabilitation of mined out area.	The top soil generated during overburden removal was backfilled for reclamation and rehabilitation of mined out area, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
ii)	Overburden shall be stacked at earmarked dump site(s) only and shall not be kept active for long period. The maximum height of the dump shall not exceed 30 m, each stage shall preferably be of 10 m and over all slope of the dump shall not exceed 28^0. The mine pit area to be reclaimed by backfilling the OB in a phased manner. The OB dumps to be scientifically vegetated with suitable native species to prevent erosion and surface run off. Monitoring and management of rehabilitated areas to be continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests on six monthly basis.	There is no overburden dump exist today. As of now, OB generated during mining operation was being used for backfilling of mined out area simultaneously. Backfilled area has been scientifically vegetated with indigenous species and native shrubs. Monitoring and management of rehabilitated areas was being done regularly so that vegetation becomes self-sustaining, when the mine was operational. Compliance status is being submitted on six monthly. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
iii)	Garland drains to be constructed to arrest silt and sediment flows from watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. Garland drain (size, gradient and length) shall be constructed for both mine pit and for waste dump and sump capacity shall be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.	Garland drains were provided to arrest the silt and sediment flows from the mine area, roads, green belt development etc, when the mine was operational. The flow from the settling tanks were then channelized through check dams. Drains and check dams were de-silted and maintained properly. Garland drains were constructed for mine pit. Sumps of sufficient capacity were provided. Sump was provided adequate retention period to allow settling of silt material. Sedimentation pits were constructed at the corners of the garland drains and desilted at regular intervals, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.

iv)	Drilling and blasting shall be by using dust extractors/wet drilling.	Drilling and blasting was carried out by using mist water jet (wet drilling), when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
v)	Plantation to be raised in an area of 22.32 ha. Including green belt of adequate width by planting the native species around the ML area, roads, OB dump sites etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 2500 plants per ha.	The lease area has natural green belt with indigenous species which was undisturbed and maintained. On slope of backfilled area, plantation of local species "Karvy" to control slope stability and soil erosion was carried out with the help of expertise / Government agencies. The plantation was carried out every year as per plan, when mine was in operation. Till date 59,150 saplings have been planted & restored about 27.5 Ha area. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
vi)	Implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	Water harvesting pond was developed in the mined out areas as per the condition given in the NOC of CGWA. Drip irrigation was in practice as conservation measures to save the water, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
vii)	Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground Water Authority and Regional Director Central Ground Water Board.	The ground water quality is monitored on quarterly basis. There was no interaction with the ground water and hence there was no disturbance to the ground water, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
viii)	Prior permission from the competent authority to be obtained for drawl of ground water, if any.	Permission for ground water withdrawal has been obtained from CGWA. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.

ix)	Vehicular emissions to be kept under control and regularly monitored. Measures to be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be over loaded.	There was a system to check the PUC certificates of all hired trucks regularly. Timely maintenance of all heavy equipments was carried out. All transport vehicles were covered with tarpaulin. The vehicles were weighed within the mines. All the vehicles were carrying bauxite as per RLW, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
x)	At the end of the mining, the void shall be used as water body for water conservation and recharging of the ground water.	At the end of the mining, the void of adequate size will be used as water body for water conservation and recharging of the ground water. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
xi)	A Final Mine Closure Plan, alongwith details of Corpus Fund, should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC. The final closure plan will be submitted as per the directions of competent authorities post resumption of mining operations.
B)	**General Conditions :-**	
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment & Forests	Noted and agreed. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
ii.	No change in the calendar plan including excavation, quantum of mineral bauxite & waste shall be made	Noted and agreed. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
iii.	Conservation measures for protection of flora & fauna in the core & buffer zone shall be drawn up in consultation with the local forest and wildlife department.	As a part of conservation measures for protection of flora and fauna, mined out area were scientifically afforested. For this we procured soil, manure, vermi compost, bagasse and press-mud to improve the condition of plantation base. We had engaged experts to implement afforestation activity. Care had been taken to plant mostly local flora along with some exotic species. The working hours were restricted only to day light, when the mine was operational.

		Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
iv.	Four ambient air quality monitoring stations shall be established in the core zone & buffer zone for RPM, SPM, SO2, NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Ambient air quality stations have been established in the core and buffer area.
v.	Regular submission of data on ambient air quality (RPM, SPM, SO2,NOx) to the Ministry including its Regional Office and the State Pollution Control Board once in six months.	The monitoring is carried out as per the schedule and Data is submitted regularly. Reports are attached.
vi.	Regular control of fugitive dust emissions from all the sources. Water spraying arrangement on haul roads, loading and unloading and at transfer points shall be provided and properly maintained.	Truck mounted mobile water tanker was being used for dust suppression during mining operation and transportation, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
vii.	Take measures for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, shall be provided with ear-plugs / muffs.	The noise levels in work environment were within the standard limits. All the workers engaged in operations of HEMM were provided with ear-plugs / muffs, when the mine was operational. Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.
viii.	Proper collection, treatment of industrial waste water to conform to the standards prescribed under GSR 422 (E) dt.19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluents.	Not Applicable, because there was no industrial waste water as there was no mineral processing is carried out.
ix.	Provide adequate training and information on safety & health aspects & provide protective respiratory devices to personnel working in dusty areas	Regular training to employees on Safety and Health aspects was provided and all the workers engaged in operations were provided dust masks, when the mine was operational.
x.	Undertake periodic Occupational health surveillance program of the workers to observe any contractions due to exposure to dust and take corrective measures, if needed.	The health surveillance was done once in a year for all employees and there are no cases of occupational health hazards, when the mine was operational.

<table>
<tr><td>xi.</td><td>Set-up separate environmental management cell with suitable qualified personnel</td><td>Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.</td></tr>
<tr><td>xii.</td><td>Inform the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.</td><td>Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.</td></tr>
<tr><td>xiii.</td><td>The funds earmarked for environmental protection measures to be kept in separate account and should not be diverted for other purpose. Yearwise expenditure shall be reported to the Ministry and its Regional Office.</td><td>The separate funds have been allocated for implementation of environmental protection measures along with item-wise breakup such as furnished below (from Apr-2021 to Sep-2021).
<table>
<tr><th>SO. NO.</th><th>Shop Order Description</th><th>Expenditure for the period (Apr-21 to Sep-21) (Rs.)</th></tr>
<tr><td>1</td><td>Nurssery & Plantation (5117)</td><td>-</td></tr>
<tr><td>2</td><td>Environment Monitoring (5119)</td><td>4,22,500</td></tr>
<tr><td>3</td><td>Dust suppression (5120)</td><td>-</td></tr>
<tr><td>4</td><td>Statutory Compliance (5121)</td><td>-</td></tr>
<tr><td>5</td><td>Environment Others</td><td>-</td></tr>
<tr><td colspan="2">TOTAL</td><td>4,22,500</td></tr>
</table>
Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.</td></tr>
<tr><td>xiv.</td><td>Inform the Regional Office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.</td><td>Please be informed that, Since February 2020, mining operations have been stopped due to directions received from MoEF & CC.</td></tr>
</table>

xv.	The Regional Office of this Ministry located at Bhopal should monitor compliance of the stipulated conditions. The project authority should extend full co-operation to the officer(s) of the Regional Office by furnishing the requisite data / information / monitoring reports.	Agreed and Noted.
xvi.	Copy of the clearance letter be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.	Complied.
xvii.	State Pollution Control Board to display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's office / Tehsildar's Office for 30 days.	Complied.
xviii.	Advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same shall be forwarded to the Regional Office of this Ministry located at Bhopal.	Complied.

ANNEXURE-(1)

F.No. J-11015/406/2006-IA-II (M)
Government of India
Ministry of Environment, Forest and Climate Change
IA-II (Non Coal Mining)

Vayu Wing, 3rd Floor,
Indira Paryavaran Bhavan, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 28th January, 2020

Sub.: Direction to the Unit under section 5 of the Environment (Protection) Act, 1986 – for revocation of Environmental Clearance -regarding

Whereas, Environmental Clearance was granted vide letter No J-11015/406/2006-IA. II (M) dated 13.04.2007 for Dhangarwadi Bauxite Mines Project of M/s Hindalco Industries Limited in Kolhapur District in Maharashtra.

Whereas, as per direction of the Hon'ble Supreme Court a team constituted by the Ministry of Environment Forest & Climate Change (MoEF&CC) visited the mining site of M/s Punthembekar Minerals limited during 10-11 October, 2017 and submitted it report to the Ministry. The matter was thereafter examined in the Ministry at it has found that Dhangarwadi Bauxite Mines Project of M/s Hindalco Industries Limited is located within 10 KM from connecting corridor of Chandoli National Park and Radhanagri Wildlife Sanctuary.

Whereas, the Hon'ble Supreme Court in its order dated 04.08.2006 in IA 1000 W.P. (c) 202 of 1995 (T.N Godavaram vs. Union of India) prohibited the mining activity around protected and as an interim measure directed that 1 Km safety zone shall be maintained subject to the order that may be made in this I.A. regarding Jamua Ramgarh Sanctuary.

Whereas, as per Ministry vide OM No. J-11013/41/2006-IA (I) dated 02/12/2009, all the development projects/activities for which the environment clearance had been granted prior to 02/12/2009 and were located within 10 KM radius of National Park/Wildlife Sanctuary were required to obtain wildlife clearance from National Board for Wildlife. In this regard, a public notice was also inserted in newspapers by the Impact Assessment Division of the Ministry in January 2009 asking the Project Proponents to seek wildlife clearance from Standing Committee of National Board for Wildlife by 31st January 2009.

Whereas, in exercise of powers vested under Section 5 of Environment (Protection) Act, 1986 direction was issued vide LR No Z-11013/3/2018 dated 15.03.2018 wherein it has mentioned that " to immediately stop all the mining activity till Wildlife Clearance from Standing Committee

of National Board of Wildlife is obtained and to show cause as why Environmental Clearance granted No J-11015/406/2006-IA.II(M) dated 13.04.2007 for Dhangarwadi Bauxite Mines Project of M/s Hindalco Industries Limited should not be revoked for carrying out mining activity within 10KM of connecting corridor of Chandoli National Park and Radhanagri Wildlife Sanctuary. You are requested to reply within 15 days of receipt of this letter, failing which your EC may be kept in abeyance."

Whereas, the reply submitted by M/s Hindalco Industries Limited vide LR dated 30.03.2018 and information submitted through email dated 30.10.2018 was examined in the Ministry. After examining the proposal, the Ministry sought clarification from National Tiger Conservation Authority (NTCA) vide email dated 17.12.2018 & 18.12.2018 and Lr. No. J-11015/406/2006-IA. II (M) dated 14.01.2019 regarding distance of mining lease from Sahyadri Tiger Reserve and notification for establishment of the same. The Ministry also sought clarification from Ministry of Mines vide Lr. No. J-11015/406/2006-IA. II (M) dated 14.01.2019 regarding mining of Aluminous Laterite by PP without including the same in the mining lease.

Whereas, the National Tiger Conservation Authority (NTCA) vide its letter No. vide its letter No 7-37/2017-NTCA dated 27.03.2019 forwarded the letter No A/D-11/No.38 (17-18)/1383/2018-19 dated 14.03.2019 issued by Conservator of Forest & Field Officer, wherein, it has mentioned that the aerial distance of Dhangarwadi Bauxite Mines Project is 6.58 KM from the boundary of Sahyadri Tiger Reserve and 46.35 KM from Radhanagari Wildlife Sanctuary, the Sahyadri Tiger Reserve was notified on 21.08.2012 and location map of the mining lease and its distance from the protected area. Thus, it's clear from the above that from 21.08.2012 onwards for carrying out mining activities the PP was required to obtain NBWL Clearance.

Whereas, as per the past production details submitted for Dhangarwadi Bauxite Mines Project it has observed that project proponent in addition to Bauxite also mined Aluminous Laterite from 2014-15 onwards. The Ministry in this regard sought clarification from Ministry of Mines, Govt of India vide its letter No. J-11015/406/2006-IA.II (M) dated 14.01.2019. The Ministry of Mines vide its letter No 16/7/2019-M.VI dated 08.02.2019 informed the ministry that *"The mineral name which has been mentioned in the mining lease deed only can be dispatched and for dispatching the mineral(s) not mentioned in the mining lease deed these minerals needs to be included in the lease deed"*. It is clear from the reply of Ministry of Mines that PP cannot dispatch Aluminous Laterite without including the same in the mining lease deed and without obtaining a prior EC for the same. The Ministry of Mines vide its notification dated 10.02.2015 also declared Laterite as a Minor Mineral.

Whereas, Ministry has notified S.O. 804(E) dated 14.03.2017 for dealing with violation category proposals as per this notification " *In case the projects or activities requiring prior environmental clearance under Environment Impact Assessment Notification, 2006 from the concerned Regulatory Authority are brought for environmental clearance after starting the construction work, or have undertaken expansion, modernization, and change in product- mix without prior environmental clearance, these projects shall be treated as cases of violations..*" Further as per para 13 (3) of this notification "*In cases of violation, action will be taken against the project proponent by the respective State or State Pollution Control Board under the provisions of section 19 of the Environment (Protection) Act, 1986 and further, no consent to operate or occupancy certificate will be issued till the project is granted the environmental clearance*". In the instant case the M/s Hindalco Industries Limited, dispatched Aluminous Laterite from 2014-15 onwards without obtaining a prior environmental clearance for the same and thus it's a violation as per S.O. 804(E) dated 14.03.2017.

Whereas, the Hon'ble Supreme Court in W.P(C) 114 of 2014 in the matter of Common Cause vs UoI in its judgement dated 2.08.2017 inter-alia mentioned that "*para 128 ..a mining lease is required to adhere to the terms of the mining scheme, the mining plan and the mining lease as well as the statutes such as the EPA, the FCA, the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981. If any mining operation is conducted in violation of any of these requirements, then that mining operation is illegal or unlawful. Any extraction of a mineral through an illegal or unlawful mining operation would become illegally or unlawfully extracted mineral...". "Para 186 (6) With effect from 14th September, 2006 all mining projects having a lease area of 5 hectares or more are required to have an EC. The extraction of any mineral in such a case without an EC would amount to illegal or unlawful mining attracting the provisions of* Section 21(5) *of the MMDR Act*". In the instant case M/s Hindalco Industries Limited, dispatched Aluminous Laterite from 2014-15 onwards without obtaining a prior environmental clearance from MoEF&CC, without consent to operate from State Pollution Control Board and without including the Aluminous Laterite in the mining lease deed.

Whereas, the Hon'ble Supreme Court in W.P(C) 202/1995 in I.A 3949 in its order dated 2.11.2018 inter-alia mentioned that "*The Chief Secretary has assured us that he will look into the matter and see whether any illegal mining has been going on, that is to say, mining 'without any forest clearance or clearance from the Standing Committee of the National Board of Wildlife. It that is so, necessary steps be taken by the State of Maharashtra to recover the amounts due to illegal mining (if any) under Section 21 (5) if the Mines and Mineral (development and Regulation) Act, 1957*".

The Ministry has examined the submission made against MoEF&CC letter No. Z-11013/3/2018 dated 15.03.2018 and other information received, and is of considered view that there is violation of provision stipulated under EIA Notification, 2006 and amendment made therein.

Now, therefore, in exercise of powers vested under Section 5 of Environment (Protection) Act, 1986, the Environmental Clearance granted vide letter J-11015/406/2006-IA. II (M) dated 13.04.2007 for Dhangarwadi Bauxite Mines Project of M/s Hindalco Industries Limited located villages Dhangarwadi, Gholaswade, Ainwadi, Hambavali, Javil & Manoli in District Kolhapur in Maharashtra is **revoked herewith** due above mentioned reasons and as the window for applying under violation category has already been closed.

Lastly, it may be noted that violation of the direction under Section 5 of Environment (Protection) Act, 1986 shall attract penal action under section 15 of the Environment (Protection) Act, 1986.

This issues with the approval of the Competent Authority.

(Sundeep)
Director/Scientist – 'F'
Email: Sundeep.moef@gmail.com
Phone/Fax: 011-24695339

To,

M/s Hindalco Industries Limited
P.O Radhanagri, Kolhapur, Maharashtra-416212

Copy to:

1) **The Chief Secretary,** Government of Maharashtra, 6th Floor Main Building, Mantralaya, Dr. Madan Cama Road, Fort, Mumbai-400032

2) **The Chairman,** Maharashtra Pollution Control Board, Kalpataru Point, 3rd and 4th floor, Opp. Cine Planet,Sion Circle, Mumbai-400 022.

3) **The Controller General,** Indian Bureau of Mines
2nd Floor, Indira Bhawan, Civil Lines, Nagpur- 440 001
Phone : + 91 712 2560041, Fax : + 91 712 2565073
email : cg@ibm.gov.in

4) **The Director**, Directorate of Geology & Mining,
Government of Maharashtra, "Khanij Bhawan", Plot No 27, Shivaji Nagar, Cement Road, Nagpur-440010.

5) **The District Collector** (Kolhapur),
District Collector Office, Kolhapur
New Shahupuri, Kolhapur, Maharashtra 416003

6) **The Additional Principal Chief Conservator of Forests (C),**
Ministry of Environment, Forest and Climate Change, Regional Office (WCZ), Ground Floor, East Wing, New Secretariat Building Civil Lines, Nagpur-440001
Tel.No.0712-2531318, Fax: 0712-2531318
Email: apccfcentral-ngp-mef@gov.in

7) **Mr. Kumar Mangalam Birla**,
Chairman, Hindalco Industries Limited
Birla Centurion, 7th floor
Pandurang Budhkar Road
Worli, Mumbai 400 030

8) MoEFCC Website

9) Guard File

(Sundeep) 24/1/2020
Director/Scientist – 'F'

HINDALCO
DURGMANWADI
14 FEB 2020
ATTN.:

DHANGARWADI
BAUXITE MINE

TAHSIL: SHAHUWADI, DISTRICT: KOLHAPUR,
STATE: MAHARASHTRA

OF

M/s HINDALCO INDUSTRIES LTD.

ENVIRONMENTAL QUALITY MONITORING REPORT

SEASON - SUMMER 2021

MARCH - APRIL - MAY- 2021

PREPARED BY

EQUINOX
Equinox Environments (India) Pvt. Ltd.

EQUINOX ENVIRONMENTS (I) PVT. LTD.,

ENVIRONMENTAL;CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS,
KOLHAPUR (MS)

E-mail: lab@equinoxenvi.com, enquiry@equinoxenvi.com

An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION

2021

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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 Summer season of the year 2021. Since 1st April due to lockdown we did not carry out monitoring in the month of April & May.

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 was carried out in core zone and buffer zone during the summer season of the year 2021. The data obtained was compiled 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
- DG Set Stack Monitoring
- Ambient Noise Level Quality
- Water Quality

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 qualityin core zone and buffer zone in and around the mine lease area during the summer season of the year 2021.

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.

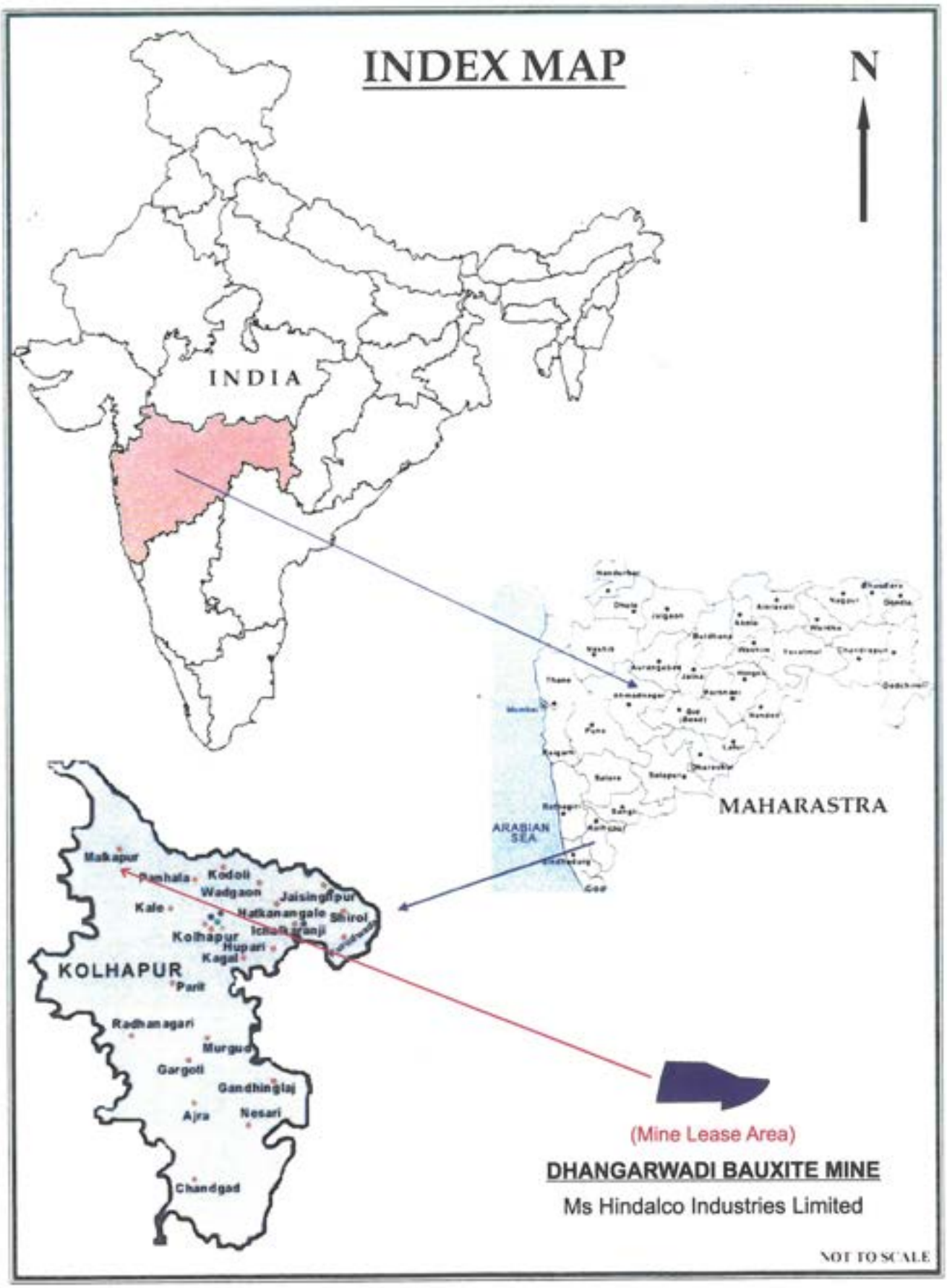
As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 41. 80 ha and the same was approved by the Indian Bureau of Mines vide letter no. MP/KLP/MAH-73-SZ, DT.11/11/2003on submission of approved mining plan Government of Maharashtra has sanctioned 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 areaon05/05/2008 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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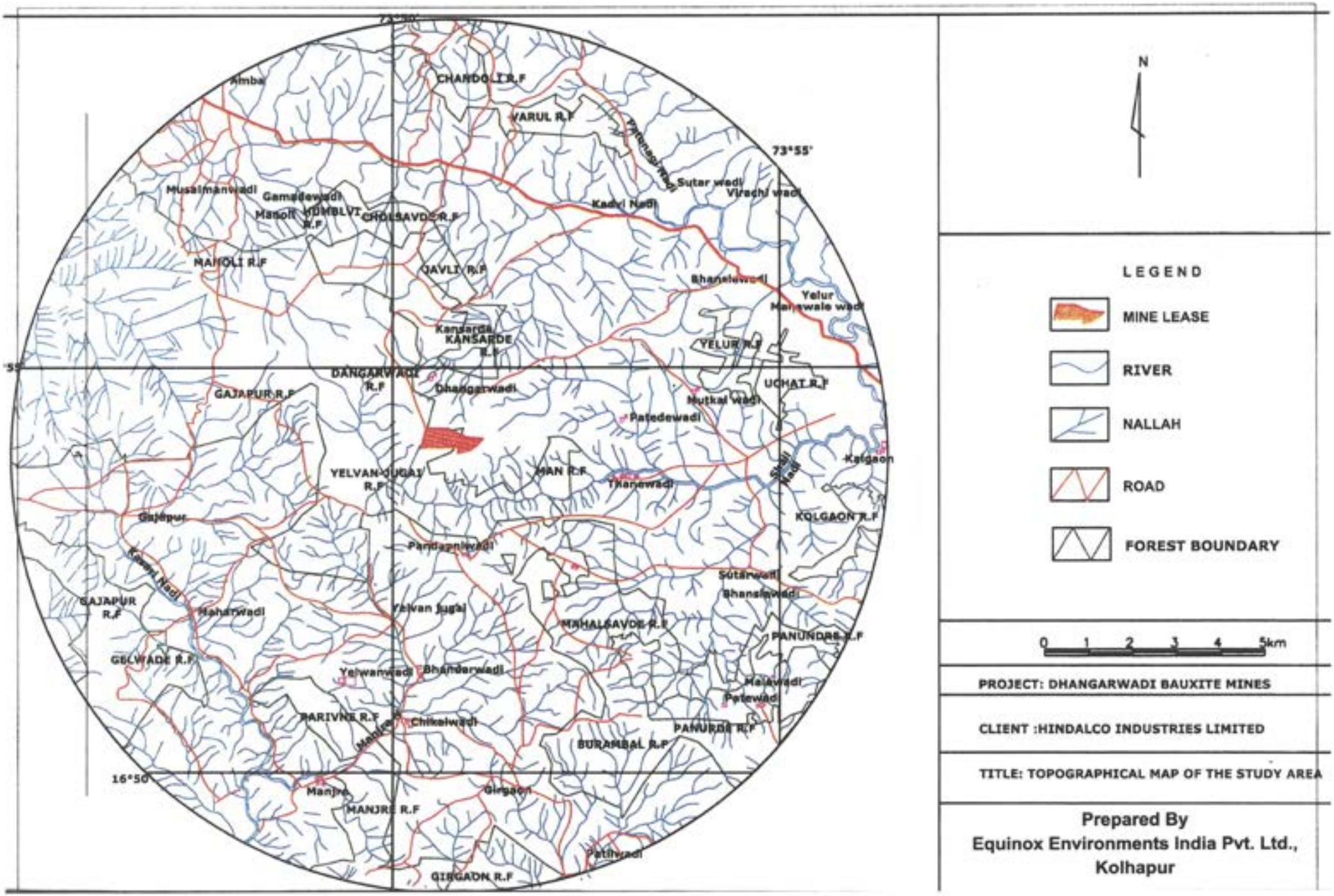
Shirol
Kolhapur
Ichalkaranji
Hupari
Kagal
Patil
Radhanagari
Murgud
Gargoti
Gandhinglaj
Ajra
Nesari
Chandgad
(Mine Lease Area)
DHANGARWADI BAUXITE MINE
Ms Hindalco Industries Limited
NOT TO SCALE



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE: TOPOGRAPHICAL MAP OF THE STUDY AREA

Prepared By
Equinox Environments India Pvt. Ltd.,
Kolhapur

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**

Note: The mining activities at Dhangarwadi Bauxite mine have been stopped due to directions received fromMinistry of Environment, Forest and Climate Change on 14th February 2020.

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 (56km)
Airport	Kolhapur (60km)
Sea Port	Ratnagiri (95km)
Biosphere reserve	Not any
Sanctuary	Chandoli wild life sanctuary is situated at about 20 kms.

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 meteorologicalparameters.

SECONDARY METEOROLOGICAL PARAMETERS

- Ambient Temperature
- Humidity

Meteorological Data March - 2021							
Date	Temperature		Humidity	Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
01/03/2021	19	36	69	0	12	6.0	W,NW
02/03/2021	18	37	72	0	11	5.5	W, NW
08/03/2021	18	36	74	0	14	7.0	W, NW
09/03/2021	20	38	70	0	13	6.5	W, NW
15/03/2021	18	37	69	0	13	6.5	W, NW
16/03/2021	19	36	70	0	12	6.0	W, NW
22/03/2021	20	38	75	0	15	7.5	W, NW
23/03/2021	19	38	82	0	16	8.0	W, NW

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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

Meteorological Data March - 2021							
Date	Temperature		Humidity	Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
01/03/2021	19	36	69	0	12	6.0	W,NW
02/03/2021	18	37	72	0	11	5.5	W, NW
08/03/2021	18	36	74	0	14	7.0	W, NW
09/03/2021	20	38	70	0	13	6.5	W, NW
15/03/2021	18	37	69	0	13	6.5	W, NW
16/03/2021	19	36	70	0	12	6.0	W, NW
22/03/2021	20	38	75	0	15	7.5	W, NW
23/03/2021	19	38	82	0	16	8.0	W, NW

ANALYZED BY

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

AUTHORIZED SIGNATORY

ENVIRONMENTAL QUALITY

Environmental quality monitoring at Dhangarwadi Bauxite Mine of M/s. Hindalco Industries Limited at Dhangarwadi village of ShahuwadiTahsil, Kolhapur district, Maharashtra includes monitoring of various environmental components like air, noise and 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 corezone and 4 in buffer zone with due considerations to the above mentionedpoints.

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.

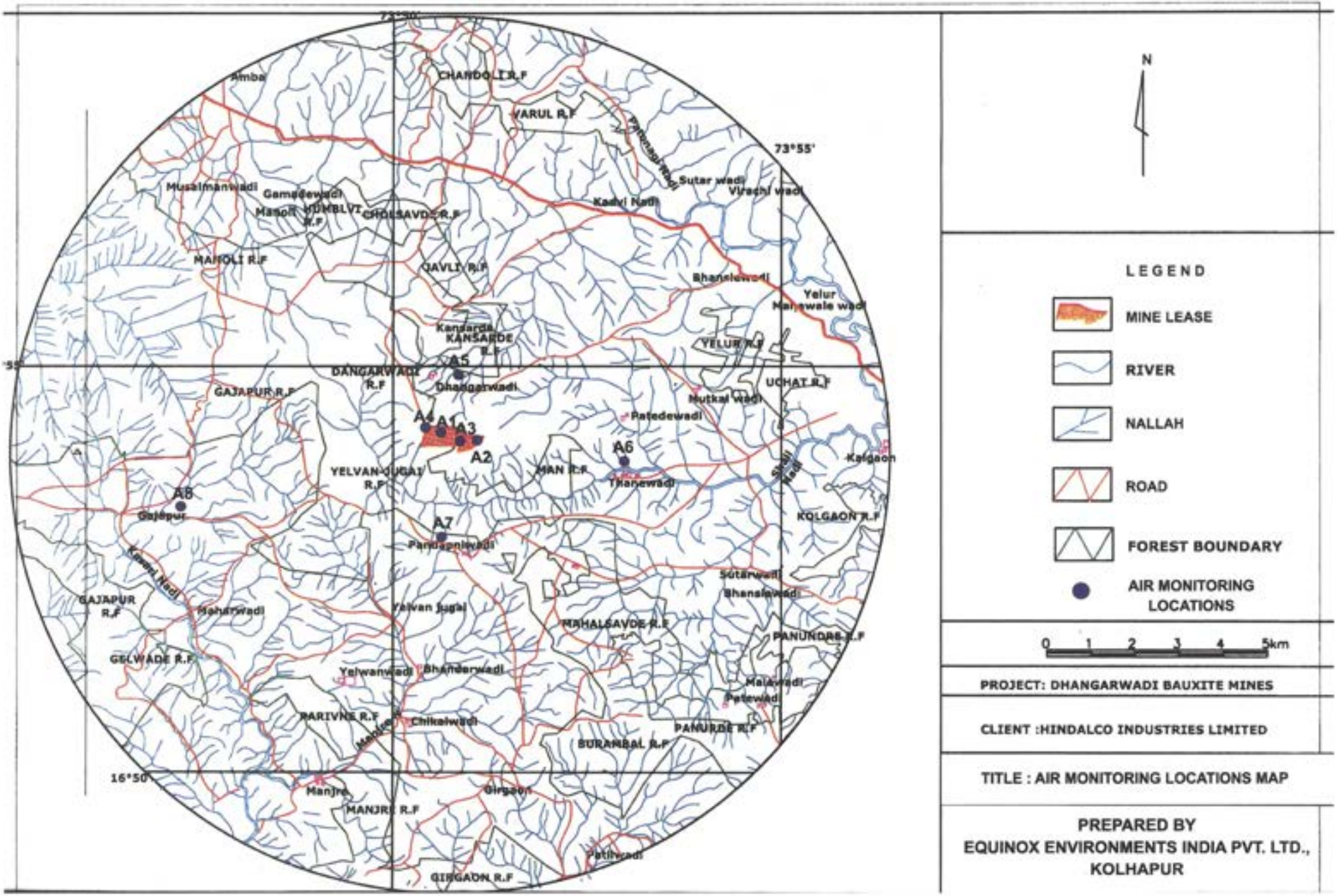
Sr. No.	Instrument Name	Ambient Fine Dust Sampler
1.	**Model No.**	IPM-FDS-M 2.5µ/10µ Fine Dust Sampler
2.	**Serial No.**	FDSM/2018-19/368-1
3.	**Calibration Details**	From 02/08/2019 To 02/07/2020
4.	**Calibration Certificate No.**	IPM-FDS/18-19/368-1

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	24hourly
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


N
73°55'
16°50'
Amba
CHANDOLI R.F
VARUL R.F
Musalmanwadi
Gamadewadi
Masoli
HUMBLVT R.F
CHOLSAVDE R.F
MAITOLI R.F
JAVLI R.F
Kadvi Nadi
Sutar wadi
Virachi wadi
Bhansiewadi
Yelur
Nalawale wadi
YELUR R.F
Kansarde
KANSARDE R.F
DANGARWADI R.F
Dhangarwadi
A5
GAJAPUR R.F
A4
A1
A3
A2
Patedewadi
Nutkal wadi
UCHAT R.F
A6
Thanewadi
YELVAN JUGAI R.F
MAN R.F
Kalgaon
Shirali Nadi
KOLGAON R.F
A8
Gajapur
A7
Pandapanwadi
Kasari Nadi
GAJAPUR R.F
Mahalwadi
Yelvan Jugai
Sutarwadi
Bhansiewadi
MAHALSAVDE R.F
PANUNDRE R.F
GELWADE R.F
Yelwanwadi
Bhanderwadi
Malawadi
Patewadi
PARIVNE R.F
Chikalwadi
PANURDE R.F
SURAMBAL R.F
Manjre
Girgaon
MANJRE R.F
Patilwadi
GIRGAON R.F
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

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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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/HIL/2020-21/04/01-08	Date of Report	02.04.2021
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	01.08.2020	31.07.2021	TECH/CAL/2020/08/1

NAME OF LOCATION- Station: A1, Near Mine Pit

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
March 2021								
01/03/2021	03/03/2021	Week-1	54.4	16.0	6.4	13.1	0.04	0.03
02/03/2021	03/03/2021	Week-1	57.3	17.1	9.2	14.0	0.06	0.02
08/03/2021	10/03/2021	Week-2	49.2	17.9	10.2	13.3	0.05	0.03
09/03/2021	10/03/2021	Week-2	53.5	15.0	8.1	15.1	0.06	0.04
15/03/2021	17/03/2021	Week-3	50.9	17.5	9.5	17.5	0.09	0.04
16/03/2021	17/03/2021	Week-3	53.4	15.6	9.4	15.4	0.08	0.01
22/03/2021	24/03/2021	Week-4	50.2	18.0	9.8	16.6	0.05	0.03
23/03/2021	24/03/2021	Week-4	52.7	16.7	7.6	14.4	0.08	0.02
April – 2021								
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May – 2021								
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emark: 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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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/HIL/2020-21/04/09-16	Date of Report	02.04.2021
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	01.08.2020	31.07.2021	TECH/CAL/2020/08/4

NAME OF LOCATION- Station: A2, Near Back Filled Area

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
March 2021								
01/03/2021	03/03/2021	Week-2	60.5	15.2	8.5	13.6	0.05	0.03
02/03/2021	03/03/2021	Week-2	58.7	16.3	7.1	11.8	0.06	0.04
08/03/2021	10/03/2021	Week-3	62.2	17.0	8.8	10.6	0.02	0.05
09/03/2021	10/03/2021	Week-3	58.4	16.5	10.9	15.0	0.05	0.06
15/03/2021	17/03/2021	Week-4	54.4	15.3	8.7	13.9	0.06	0.02
16/03/2021	17/03/2021	Week-4	55.2	16.6	10.5	15.0	0.05	0.05
22/03/2021	24/03/2021	Week-5	58.5	15.9	9.1	14.2	0.04	0.02
23/03/2021	24/03/2021	Week-5	55.5	19.2	9.5	15.3	0.03	0.03
April – 2021								
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May – 2021								
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Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

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Authorized Signatory

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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

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/HIL/2020-21/04/17-24	Date of Report	02.04.2021
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	01.08.2020	31.07.2021	TECH/CAL/2020/08/3

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
March 2021								
01/03/2021	03/03/2021	Week-1	55.6	17.3	9.6	15.0	0.04	0.02
02/03/2021	03/03/2021	Week-1	58.1	18.0	8.4	13.4	0.03	0.02
08/03/2021	10/03/2021	Week-2	56.4	15.6	10.9	15.7	0.07	0.04
09/03/2021	10/03/2021	Week-2	52.6	16.3	12.0	13.9	0.03	0.06
15/03/2021	17/03/2021	Week-3	56.7	18.4	11.9	14.2	0.04	0.04
16/03/2021	17/03/2021	Week-3	58.0	15.3	12.5	15.9	0.06	0.06
22/03/2021	24/03/2021	Week-4	52.7	13.9	11.3	16.1	0.05	0.03
23/03/2021	24/03/2021	Week-4	58.3	17.8	12.6	16.3	0.06	0.02
April – 2021								
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May – 2021								
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emark: All Parameters are within NAAQS Standards.
N.S. Not Specified

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Lab Chemist

Authorized Signatory

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Ambient Air Quality Monitoring Report

Report No-		GESEC/PRO/HIL/2020-21/04/25-32			Date of Report	02.04.2021		
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	01.08.2020	31.07.2021			TECH/CAL/2020/08/2		
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
March 2021								
03/03/2021	05/03/2021	Week-1	56.6	13.1	11.6	16.6	0.06	0.04
04/03/2021	05/03/2021	Week-1	55.2	13.7	11.0	16.7	0.04	0.01
10/03/2021	12/03/2021	Week-2	56.4	16.4	13.0	16.5	0.02	0.02
11/03/2021	12/03/2021	Week-2	58.6	15.5	11.1	16.3	0.04	0.02
17/03/2021	19/03/2021	Week-3	52.8	13.3	10.5	13.2	0.05	0.05
18/03/2021	19/03/2021	Week-3	52.2	14.6	11.8	14.8	0.03	0.03
24/03/2021	26/03/2021	Week-4	58.5	12.4	11.7	15.1	0.05	0.04
25/03/2021	26/03/2021	Week-4	58.1	14.5	11.0	15.9	0.04	0.02
April – 2021								
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May – 2021								
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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/HIL/2020-21/04/33-40	Date of Report	02.04.2021
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	01.08.2020	31.07.2021	TECH/CAL/2020/08/1

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
March 2021								
03/03/2021	05/03/2021	Week-1	52.5	15.3	11.9	15.0	0.05	0.03
04/03/2021	05/03/2021	Week-1	53.9	15.1	10.2	15.7	0.05	0.04
10/03/2021	12/03/2021	Week-2	52.5	14.9	10.3	17.6	0.04	0.04
11/03/2021	12/03/2021	Week-2	53.8	14.9	11.1	17.9	0.06	0.01
17/03/2021	19/03/2021	Week-3	54.9	15.4	10.3	15.5	0.06	0.03
18/03/2021	19/03/2021	Week-3	55.4	15.6	12.7	17.4	0.05	0.05
24/03/2021	26/03/2021	Week-4	53.2	15.7	10.5	15.3	0.06	0.02
25/03/2021	26/03/2021	Week-4	53.1	14.3	12.4	16.9	0.04	0.04
April – 2021								
--	--	Week-2	--	--	--	--	--	--
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--	--	Week-4	--	--	--	--	--	--
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May – 2021								
--	--	Week-1	--	--	--	--	--	--
--	--	Week-1	--	--	--	--	--	--
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Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

Lab Chemist

Authorized Signatory

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CIN No. : U74900PN2013PTC149666

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/HIL/2020-21/04/41-48	Date of Report	02.04.2021
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	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& alibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	01.08.2020	31.07.2021	TECH/CAL/2020/08/1

AME 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
March 2021								
03/03/2021	05/03/2021	Week-1	54.7	12.5	10.9	14.0	0.06	0.05
04/03/2021	05/03/2021	Week-1	59.0	15.5	13.1	15.9	0.02	0.02
10/03/2021	12/03/2021	Week-2	55.0	13.5	10.1	14.2	0.04	0.03
11/03/2021	12/03/2021	Week-2	54.2	15.5	11.1	16.5	0.06	0.02
17/03/2021	19/03/2021	Week-3	54.2	13.8	10.0	17.6	0.03	0.02
18/03/2021	19/03/2021	Week-3	53.3	14.6	12.7	17.9	0.03	0.05
24/03/2021	26/03/2021	Week-4	55.3	13.8	11.7	16.9	0.04	0.02
25/03/2021	26/03/2021	Week-4	57.3	16.9	11.8	15.3	0.03	0.04
April – 2021								
--	--	Week-2	--	--	--	--	--	--
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--	--	Week-4	--	--	--	--	--	--
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May – 2021								
--	--	Week-1	--	--	--	--	--	--
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emark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Kolhe
Lab Chemist

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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

Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/HIL/2020-21/04/49-56	Date of Report	02.04.2021
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	01.08.2020	31.07.2021	TECH/CAL/2020/08/1

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
March 2021								
05/03/2021	07/03/2021	Week-2	15.9	12.6	17.5	15.9	0.03	0.04
06/03/2021	07/03/2021	Week-2	12.5	13.7	16.2	12.5	0.01	0.04
12/03/2021	14/03/2021	Week-3	15.9	13.9	18.2	15.9	0.02	0.02
13/03/2021	14/03/2021	Week-3	14.6	12.8	16.9	14.6	0.03	0.01
19/03/2021	21/03/2021	Week-4	13.0	11.4	14.4	13.0	0.03	0.03
20/03/2021	21/03/2021	Week-4	14.6	12.0	17.2	14.6	0.05	0.01
26/03/2021	29/03/2021	Week-5	15.5	13.7	18.3	15.5	0.02	0.03
27/03/2021	29/03/2021	Week-5	12.1	11.0	16.2	12.1	0.04	0.01
April – 2021								
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May – 2021								
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Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

Lab Chemist

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/HIL/2020-21/04/57-64	Date of Report	02.04.2021
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	01.08.2020	31.07.2021	TECH/CAL/2020/08/1

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
March 2021								
05/03/2021	07/03/2021	Week-2	53.4	12.7	10.9	15.4	0.02	0.01
06/03/2021	07/03/2021	Week-2	53.3	15.5	12.2	15.6	0.02	0.02
12/03/2021	14/03/2021	Week-3	54.0	11.6	12.1	15.9	0.01	0.02
13/03/2021	14/03/2021	Week-3	52.5	15.6	10.0	15.6	0.02	0.02
19/03/2021	21/03/2021	Week-4	55.2	13.7	12.7	16.9	0.03	0.03
20/03/2021	21/03/2021	Week-4	57.0	13.2	12.4	17.0	0.03	0.01
26/03/2021	29/03/2021	Week-5	52.8	16.2	12.9	18.2	0.05	0.02
27/03/2021	29/03/2021	Week-5	56.2	13.8	10.9	14.2	0.01	0.02
April – 2021								
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May – 2021								
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Remark: All Parameters are within NAAQS Standards.
N.S. Not Specified

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

Lab Chemist

Authorized Signatory

Monitoring Location Details

Respirable dust sampler and Fine particulate sampler were placed at a height of 3meter 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}, $PM_{2.5}$, SO_2, NOx, CO and HC collected during Summer season of the year 2021are presented in annexure and are summarized in the following table.

AMBIENT AIR QUALITY MONITORING STATION

Sr. No.	Station Code	Name of the Sampling Station	Direction W.R.T. Mines Lease Area
1	A-1	Near Mine Pit	- - -
2	A-2	Near Back Filled Area	- - -
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

Summary of Ambient Air Quality

Sr. 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 Pit	Min	49.20	15.00	6.40	13.10	0.04	0.01
		Max	57.30	18.00	10.20	17.50	0.09	0.04
		Mean	52.70	16.73	8.78	14.93	0.06	0.03
		10th percentile	49.90	15.42	7.24	13.24	0.05	0.02
		30th percentile	51.08	16.07	8.21	14.04	0.05	0.02
		50th percentile	53.05	16.90	9.30	14.75	0.06	0.03
		95th percentile	56.29	17.97	10.06	17.19	0.09	0.04
		98th percentile	56.89	17.99	10.14	17.37	0.09	0.04
2	Near Back Filled Area	Min	54.40	15.20	7.10	10.60	0.02	0.02
		Max	62.20	19.20	10.90	15.30	0.06	0.06
		Mean	57.93	16.50	9.14	13.68	0.05	0.04
		10th percentile	54.96	15.27	8.08	11.44	0.03	0.02
		30th percentile	54.88	15.94	8.71	13.63	0.04	0.03
		50th percentile	58.45	16.40	8.95	14.05	0.05	0.04
		95th percentile	61.61	18.43	10.76	15.20	0.06	0.06
		98th percentile	61.96	18.89	10.84	15.26	0.06	0.06
3	Near Haulage Road	Min	52.60	13.90	8.40	13.40	0.03	0.02
		Max	58.30	18.40	12.60	16.30	0.07	0.06
		Mean	56.05	16.58	11.15	15.06	0.05	0.04
		10th percentile	52.67	14.88	9.24	13.75	0.03	0.02
		30th percentile	55.68	15.67	10.94	14.28	0.04	0.02
		50th percentile	56.55	16.80	11.60	15.35	0.05	0.04
		95th percentile	58.23	18.26	12.57	16.23	0.07	0.06
		98th percentile	58.27	18.34	12.59	16.27	0.07	0.06
4	Near Mines Office /DG Set	Min	52.20	12.40	10.50	13.20	0.02	0.01
		Max	58.60	16.40	13.00	16.70	0.06	0.05
		Mean	56.05	14.19	11.46	15.64	0.04	0.03
		10th percentile	52.62	12.89	10.85	14.32	0.03	0.02
		30th percentile	55.32	13.34	11.01	15.18	0.04	0.02
		50th percentile	56.50	14.10	11.35	16.10	0.04	0.03
		95th percentile	58.57	16.09	12.58	16.67	0.06	0.05
		98th percentile	58.59	16.27	12.83	16.69	0.06	0.05
5	Dhangarwadi Village	Min	52.50	14.30	10.20	15.00	0.04	0.01
		Max	55.40	15.70	12.70	17.90	0.06	0.05
		Mean	53.66	15.15	11.18	16.41	0.05	0.03
		10th percentile	52.50	14.72	10.27	15.21	0.04	0.02
		30th percentile	53.11	14.92	10.32	15.52	0.05	0.03
		50th percentile	53.50	15.20	10.80	16.30	0.05	0.04
		95th percentile	55.23	15.67	12.60	17.80	0.06	0.05
		98th percentile	55.33	15.69	12.66	17.86	0.06	0.05
6	Thanewadi Village	Min	53.30	12.50	10.00	14.00	0.02	0.02
		Max	59.00	16.90	13.10	17.90	0.06	0.05
		Mean	55.38	14.51	11.43	16.04	0.04	0.03
		10th percentile	53.93	13.20	10.07	14.14	0.03	0.02

		30th percentile	54.25	13.80	10.92	15.36	0.03	0.02
		50th percentile	54.85	14.20	11.40	16.20	0.04	0.03
		95th percentile	58.41	16.41	12.96	17.80	0.06	0.05
		98th percentile	58.76	16.70	13.04	17.86	0.06	0.05
7	Pandapniwadi Village	Min	12.10	11.00	14.40	12.10	0.01	0.01
		Max	15.90	13.90	18.30	15.90	0.05	0.04
		Mean	14.26	12.64	16.86	14.26	0.03	0.02
		10th percentile	12.38	11.28	15.66	12.38	0.02	0.01
		30th percentile	13.16	12.06	16.27	13.16	0.02	0.01
		50th percentile	14.60	12.70	17.05	14.60	0.03	0.03
		95th percentile	15.90	13.83	18.27	15.90	0.05	0.04
		98th percentile	15.90	13.87	18.29	15.90	0.05	0.04
8	Gajapur Village	Min	52.50	11.60	10.00	14.20	0.00	0.01
		Max	57.00	16.20	12.90	18.20	0.05	0.03
		Mean	54.30	14.04	11.76	16.10	0.02	0.02
		10th percentile	52.71	12.37	10.63	15.04	0.01	0.01
		30th percentile	53.31	13.25	11.02	15.60	0.02	0.02
		50th percentile	53.70	13.75	12.15	15.75	0.02	0.02
		95th percentile	56.72	15.99	12.83	17.78	0.04	0.03
		98th percentile	56.89	16.12	12.87	18.03	0.05	0.03

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

The Ministry of Environment and Forest (MoEF), Govt of India, vide gezette notification, G.S.R826 (E), dated 16.11.2009 have notified the National Ambient Air Quality Standards by amending the Environment (Protection) Rules 1986.

The following are the major changes have been effected.

1. As against **three** [(i) **Industrial Area** (ii) **Residential, Rural & other areas** (iii) **Sensitive Area]** areas, the new standards is applicable for only two areas viz. (i) Industrial , Residential , Rural, and other areas (ii) Ecologically Sensitive Area (Notified by Central Government)
2. The Industrial area, Residential, Rural, and other areas have been clubbed, Ecologically Sensitive area to be notified by Central Government.
3. The new parameters included are particulate matter size less than 2.5 µm **OR** PM2.5 $\mu g/M^3$, Ozone, ammonia (NH_3), Benzene , Benzo(a)pyrene(BaP) , Arsenic (As) and Nickel (Ni)
4. Ambient air quality data generated under National Ambient Air Quality Monitoring Programme (NAMP) has been compared with revised national ambient air quality standards for the year 2010-11

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(S02)	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	8 hours**	2.0 mg/m3	2.0 mg/m3	-Non Dispersive Infra Red (NDIR)

	Monoxide (CO)	1 hour	4.0 mg/m3	4.0 mg/m3	spectroscopy
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.

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

DG Set Stack Monitoring Report			
Report No.	**GESEC/PRO/HIL/2020-21/03/76**	**Date of Report**	**19/03/2021**
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	**09/03/2021**		
Name of Instrument & Calibration Details	**Date of calibration**	**Calibration Due Date**	**Calibration Certificate No.**
	21.12.2019	03/02/2022	TECH/CAL/2021/0.2B/33
Analysis Method	IS 11255(Part 2):1985,RA 2003		

Stack Details

Stack–attached to	DG (45 KVA) [-II-]	I.D. of stack at port (m)D	0.10
Cross-section 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)	69.00
2	Differential Pressure	0.10
3	Velocity of the gas (m/sec)	1.11
4	Gas flow rate at NTP (Nm^3/hr)	27.39
5	Particulate matter	9.36
6	SO_2 (Kg/Hr)	0.000088

ANALYZED BY

GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

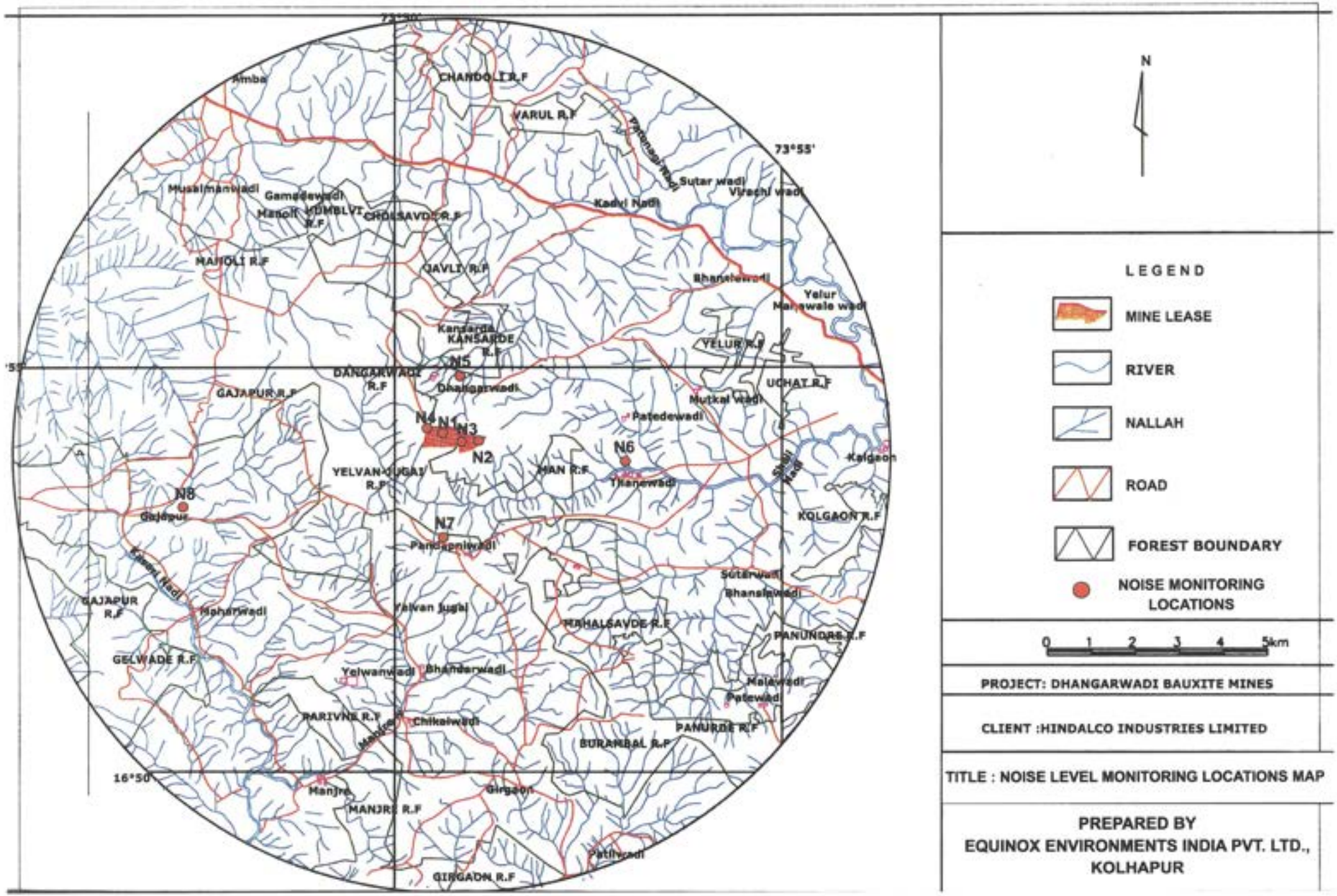
AUTHORIZED SIGNATORY

Stack Details				
Stack–attached to	DG (45 KVA) [-II-]		I.D. of stack at port (m)D	0.10
Cross-section 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 (^{o}C)	69.00
2	Differential Pressure	0.10
3	Velocity of the gas (m/sec)	1.11
4	Gas flow rate at NTP (Nm^3/hr)	27.39
5	Particulate matter	9.36
6	SO_2 (Kg/Hr)	0.000088

Remark:

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


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
Hanoli
HANOLI R.F
CHOLSAVDE R.F
Kadvi Nadi
Sutar wadi
Virachi wadi
JAVLI R.F
Bhansalewadi
Yelur
Kansarde
KANSARDE R.F
YELUR R.F
DANGARWADI R.F
Dhangarwadi
UCHAT R.F
Mutkal wadi
GAJAPUR R.F
Patedewadi
YELVAN JUGAI R.F
HAN R.F
Thanewadi
Kalgaon
Gajapur
KOLGAON R.F
Pandapniwadi
Sutarwadi
Bhansalwadi
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
BURANDAL R.F
Manjre
Girgaon
MANJRE R.F
Patilwadi
GIRGAON R.F

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 hour 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 Pit	- - -
2	A-2	Near Back Filled Area	- - -
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.

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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/HIL/2020-21/04/65-72	Date of Report	02.04.2021
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	March-2021		

Name of Instrument & Calibration Details	Date of calibration	Calibration Due Date	Calibration Certificate No.
Sound Level meter	01/08/2020	31/07/2021	TECH/CAL/2020/08/23
Analysis Method	S: 4758-1968 Reaff.2002		

Date	01/03/2021	03/03/2021	05/03/2021	08/03/2021	10/03/2021	12/03/2021	15/03/2021	17/03/2021
Location	Near Mine Pit	Near Back Filled Area	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	46.1	50.2	47.6	45.3	43.4	44.1	50.2	51.5
7.00	53.2	51.2	53.1	50.4	43.0	43.7	47.0	48.1
8.00	52.2	50.5	52.2	49.9	43.9	45.2	48.5	49.3
9.00	53.1	51.7	50.4	48.8	48.3	50.9	50.6	51.4
10.00	53.1	50.5	49.1	49.8	49.2	49.2	50.9	50.8
11.00	53.6	51.0	50.1	50.6	50.2	49.3	47.3	48.6
12.00	54.8	45.5	50.6	52.0	49.8	49.6	48.2	48.4
13.00	53.0	50.5	48.9	49.8	50.0	49.5	48.2	48.2
14.00	53.0	50.1	48.4	49.3	50.5	50.6	48.3	50.2
15.00	51.3	48.9	49.8	48.6	49.7	48.8	49.3	50.9
16.00	49.7	52.5	50.6	48.9	50.3	52.0	49.6	50.7
17.00	53.4	50.8	49.4	48.8	50.3	49.3	49.8	48.2
18.00	52.6	49.8	50.6	51.4	50.9	52.1	51.2	51.1
19.00	53.0	49.7	50.8	52.1	49.8	49.1	49.3	49.5
20.00	52.3	48.9	49.1	50.3	48.5	48.2	51.4	48.4
21.00	49.8	49.4	49.9	50.2	48.7	49.7	51.1	40.1
22.00	44.5	46.2	46.3	46.6	47.2	47.1	51.4	40.2
L10	**48.3**	**47.8**	**48.1**	**47.8**	**43.7**	**44.8**	**47.8**	**44.9**
L50	**53.0**	**50.2**	**49.9**	**49.8**	**49.7**	**49.3**	**49.6**	**49.3**
L90	**53.5**	**51.4**	**51.4**	**51.6**	**50.4**	**51.3**	**51.3**	**51.2**
Lday	**53.5**	**50.4**	**50.1**	**50.0**	**50.4**	**50.0**	**49.8**	**50.0**
23.00	44.3	44.2	43.8	42.6	43.3	42.0	43.5	44.0
24.00	48.1	42.3	41.9	40.6	40.8	41.2	41.1	40.9
1.00	47.4	42.0	40.0	40.9	41.1	41.5	42.0	40.7
2.00	47.3	40.4	41.2	41.7	42.5	43.8	41.1	42.2
3.00	41.3	41.6	40.4	40.0	40.8	41.5	41.5	41.3
4.00	44.2	40.4	40.1	41.3	41.1	41.5	40.9	42.1
5.00	44.3	43.8	40.5	41.0	40.8	42.3	41.7	41.9
L10	**43.0**	**40.4**	**40.1**	**40.4**	**40.8**	**41.4**	**41.0**	**40.8**
L50	**44.3**	**42.0**	**40.5**	**41.0**	**41.1**	**41.5**	**41.5**	**41.9**
L90	**47.7**	**44.0**	**42.7**	**42.1**	**42.8**	**42.9**	**42.6**	**42.9**

GREEN ENVIROSAFE PUNE Engineers & Consultant

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CIN No. : U74900PN2013PTC149666

Lnight	44.7	42.2	40.6	41.0	41.2	41.5	41.5	42.0
Ldn	53.9	51.2	50.3	50.4	50.7	50.7	50.5	50.8
Avg L10	45.7	44.1	44.1	44.1	42.3	43.1	44.4	42.9
Avg L 50	48.7	46.1	45.2	45.4	45.4	45.4	45.6	45.6
Avg L 90	50.6	47.7	47.0	46.9	46.6	47.1	46.9	47.1

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GREEN ENVIROSAFE Engineers & Consultant Pvt. Ltd. PUNE

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AMBIENT NOISE LEVEL MONITORING RESULTS [Leqin dB(A)]

Date	01/03/2021	03/03/2021	05/03/2021	08/03/2021	10/03/2021	12/03/2021	15/03/2021	17/03/2021
Location	Near Mine Pit	Near Back Filled Area	Near Haulage Road	Near Mines Office /DG Set	Dhangarwadi Village	Thanewadi Village	Pandapniwadi Village	Gajapur Village
L_{10}	48.3	47.8	48.1	47.8	43.7	44.8	47.8	44.9
L_{50}	53.0	50.2	49.9	49.8	49.7	49.3	49.6	49.3
L_{90}	53.5	51.4	51.4	51.6	50.4	51.3	51.3	51.2
L_{day}	53.5	50.4	50.1	50.0	50.4	50.0	49.8	50.0
L_{10}	43.0	40.4	40.1	40.4	40.8	41.4	41.0	40.8
L_{50}	44.3	42.0	40.5	41.0	41.1	41.5	41.5	41.9
L_{90}	47.7	44.0	42.7	42.1	42.8	42.9	42.6	42.9
L_{night}	44.7	42.2	40.6	41.0	41.2	41.5	41.5	42.0
L_{dn}	53.9	51.2	50.3	50.4	50.7	50.7	50.5	50.8
Avg L_{10}	45.7	44.1	44.1	44.1	42.3	43.1	44.4	42.9
Avg L_{50}	48.7	46.1	45.2	45.4	45.4	45.4	45.6	45.6
Avg L_{90}	50.6	47.7	47.0	46.9	46.6	47.1	46.9	47.1

Remark:

All the obtained noise level quality values in core zone and buffer zone as compared with the noise level standards prescribed by Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 are found to be within the limit.

Ambient Noise Standards

SCHEDULE

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

Area code	Category of Area / Zone	Limits 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 shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* **dB(A) Leq** denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in **dB(A) Leq,** denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

Note : The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 vide S.O. 1046(E), dated 22.11.2000 and by the Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O. 1088(E), dated 11.10.2002, under the Environment (Protection) Act, 1986.

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.

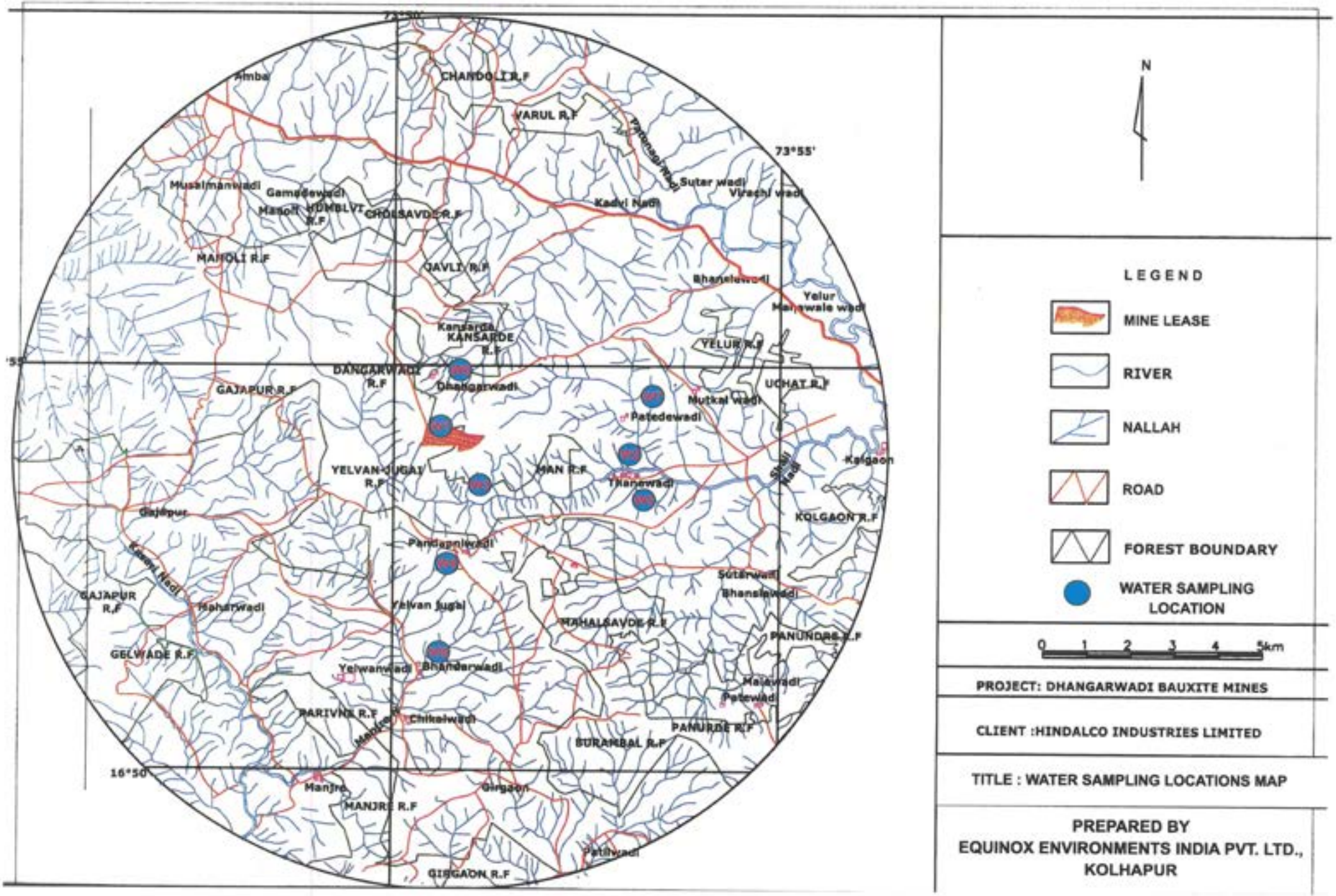
A total of 8 locations have selected, out of which 5 are for ground water and 3 are for surface water. Location of water quality monitoring stations is given below.

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, 2012 (Drinking water standard). Samples were collected in summer season of the year 2020-21 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	ShaliNadi (Up Stream)	Surface Water
W-3	ShaliNadi (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°55'
16°50'
Amba
CHANDOLI R.F
VARUL R.F
Mussalmanwadi
Gamdewadi
Masoli
HUMBLVI R.F
CHOUSAVDE R.F
MAHOLI R.F
JAVLI R.F
Kadvi Nadi
Sutar wadi
Virachi wadi
Bhanelawadi
Yelur
Mahawale wadi
YELUR R.F
Kansarde
KANSARDE R.F
DANGARWADI R.F
Dhangarwadi
GAJAPUR R.F
Patedewadi
Mutkal wadi
UCHAT R.F
YELVAN-JUGAI R.F
MAN R.F
Thanewadi
Kalgaon
Shirali Nadi
KOLGAON R.F
Gajapur
Pandapniwadi
Kasari Nadi
Suterwadi
Bhanelawadi
GAJAPUR R.F
Maharwadi
Yelvan Jugai
MAHALSAVDE R.F
PANUNDRE R.F
GELWADE R.F
Yelwanwadi
Bhanderwadi
Halawadi
Patewadi
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

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Engineers & Consultant Pvt Ltd.
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CIN No. : U74900PN2013PTC149666

Client Name:	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.	Report Number	GESEC/PRO/2020-21/03/74
Project Name and Address: M/s. Hindalco Industries Limited, Dhangarwadi Bauxite Mine, Dhangarwadi Village, Shahuwadi Taluka, Kolhapur District, Maharashtra.		Date of Report	19/03/2021
		Nature of sample	Surface Water
		Date of Sampling	09/03/2021
		Date of Sample Received	10/03/2021
		Date of Sample Analysis	10/03/2021

Sample Collected & Analyzed By: Green Envirosafe Engineers & Consultant Pvt. Ltd., Pune, Maharashtra.			Location		
Sr. No.	Parameter	Unit(s)	W1 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	--	7.67	7.56	7.82
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	3.71	4.02	3.56
7.	TDS	mg/lit	260.98	172.58	235.69
8.	TSS	mg/lit	25.69	9.85	14.77
9.	BOD:3 days at 27°C	mg/lit	10.24	5.01	8.12
10.	Alkalinity as $CaCO_3$	mg/lit	35.69	10.63	15.74
11.	Total Hardness as $CaCO_3$	mg/lit	171.81	73.68	92.96
12.	Nitrate as NO_3	mg/lit	35.21	8.24	13.69
13.	Phosphorous as PO_4	mg/lit	1.26	0.15	0.33
14.	Chlorides as Cl^-	mg/lit	55.69	18.47	25.74
15.	Sulphates as SO_4	mg/lit	6.81	2.25	3.63
16.	Sodium as Na	mg/lit	5.74	0.62	0.95
17.	Potassium as K	mg/lit	12.63	2.79	4.26
18.	Calcium as Ca	mg/lit	51.47	24.71	30.94
19.	Magnesium as Mg	mg/lit	10.47	2.89	3.79
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	0.28	0.02	0.07
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

BDL: Below Detectable Limit

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SURFACE WATER QUALITY					
Sr. No.	Parameter	Unit (s)	Location		
			W-1 Mine Pit Water	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	<5.00	<5.00	<5.00
4.	pH	--	7.67	7.56	7.82
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	3.71	4.02	3.56
7.	TDS	mg/lit	260.98	172.58	235.69
8.	TSS	mg/lit	25.69	9.85	14.77
9.	BOD:3 days at 27°C	mg/lit	10.24	5.01	8.12
10.	Alkalinity as $CaCO_3$	mg/lit	35.69	10.63	15.74
11.	Total Hardness as $CaCO_3$	mg/lit	171.81	73.68	92.96
12.	Nitrate as NO_3	mg/lit	35.21	8.24	13.69
13.	Phosphorous as PO_4	mg/lit	1.26	0.15	0.33
14.	Chlorides as Cl^-	mg/lit	55.69	18.47	25.74
15.	Sulphates as SO_4	mg/lit	6.81	2.25	3.63
16.	Sodium as Na	mg/lit	5.74	0.62	0.95
17.	Potassium as K	mg/lit	12.63	2.79	4.26
18.	Calcium as Ca	mg/lit	51.47	24.71	30.94
19.	Magnesium as Mg	mg/lit	10.47	2.89	3.79
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	0.28	0.02	0.07
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 Detectable 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, 2012 Standard for Drinking Water.

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

DHANGARWADI MINES				
WELL DEPTHS OF VILLAGES				
Date of Report-GESEC/PRO/2020-21/03/77				
DATE OF SAMPLING: 04.01.2021				
Sr. NO.	**LOCATION**	**NAME OF THE MINE AREA**	**TOTAL DEPTH IN MTS**	**WATER LEVEL FROM SURFACE IN MTS**
1	PANDAPNIWADI VILLAGE	**DHANGARWADI**	6.00	1.82
2	DHANGARWADI VILLAGE	**DHANGARWADI**	6.00	3.61

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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, 2012 (Drinking water standard). A total of 5 locations have selected from buffer zone.

DHANGARWADI MINES			
Well Depths of Villages			
Sr. No.	**Location**	**Total Depth in Meters**	**Water Level From Surface in Meters**
1	Pandapniwadi Village	6.00	1.82
2	Dhangarwadi Village	6.00	3.61

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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

Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	**GESEC/PRO/2020-21/03/73**
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**	**19/03/2021**
		Nature of sample	**Ground water**
		Date of Sampling	**09/03/2021**
		Date of Sample Received	**10/03/2021**
		Date of Sample Analysis	**10/03/2021**

Sample Collected & Analyzed By : Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra			**Location**				
			PANDAPNIWADI VILLAGE	**THANEWADI VILLAGE**	**DHANGARWADI VILLAGE**	**PATEWADI VILLAGE**	**BHANDARWADI VILLAGE**
Sr. No.	**Parameter**	**Unit(s)**	**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	--	7.92	7.77	7.95	7.78	7.92
5.	Turbidity	NTU	<5.00	<5.00	<5.00	<5.00	<5.00
6.	Dissolved Oxygen	mg/l	2.23	2.66	2.12	2.35	2.21
7.	Total Dissolved solids	mg/l	169.35	132.54	185.63	162.70	171.94
8.	Total Suspended solids	mg/l	11.52	9.02	12.75	9.63	10.59
9.	B.O.D	mg/l	8.40	7.02	11.56	8.23	8.47
10.	Alkalinity as $CaCO_3$	mg/l	22.75	13.69	24.78	16.92	20.56
11.	Total Hardness as $CaCO_3$	mg/l	88.87	59.05	109.20	67.31	79.38
12.	Nitrate as NO_3	mg/l	11.59	9.68	16.57	10.74	11.42
13.	Phosphates as PO_4	mg/l	0.87	0.55	1.63	0.81	0.79
14.	Chlorides as Cl	mg/l	25.87	15.89	29.68	57.66	24.60
15.	Sulphates as SO_4	mg/l	5.69	3.12	9.26	4.74	6.91
16.	Sodium as Na	mg/l	3.02	2.63	6.87	2.94	4.10
17.	Potassium as K	mg/l	11.25	6.87	16.43	9.20	13.59
18.	Calcium as Ca	mg/l	28.71	15.99	30.76	19.31	25.82
19.	Magnesium as Mg	mg/l	4.15	4.63	7.84	4.62	3.60
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	0.09	0.07	0.12	0.14	0.09
27.	Fluoride as F	mg/l	BDL	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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GROUND WATER QUALITY							
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	--	7.92	7.77	7.95	7.78	7.92
5.	Turbidity	NTU	<5.00	<5.00	<5.00	<5.00	<5.00
6.	Dissolved Oxygen	mg/l	2.23	2.66	2.12	2.35	2.21
7.	Total Dissolved solids	mg/l	169.35	132.54	185.63	162.70	171.94
8.	Total Suspended solids	mg/l	11.52	9.02	12.75	9.63	10.59
9.	B.O.D	mg/l	8.40	7.02	11.56	8.23	8.47
10.	Alkalinity as $CaCO_3$	mg/l	22.75	13.69	24.78	16.92	20.56
11.	Total Hardness as $CaCO_3$	mg/l	88.87	59.05	109.20	67.31	79.38
12.	Nitrate as NO_3	mg/l	11.59	9.68	16.57	10.74	11.42
13.	Phosphates as PO_4	mg/l	0.87	0.55	1.63	0.81	0.79
14.	Chlorides as Cl	mg/l	25.87	15.89	29.68	57.66	24.60
15.	Sulphates as SO_4	mg/l	5.69	3.12	9.26	4.74	6.91
16.	Sodium as Na	mg/l	3.02	2.63	6.87	2.94	4.10
17.	Potassium as K	mg/l	11.25	6.87	16.43	9.20	13.59
18.	Calcium as Ca	mg/l	28.71	15.99	30.76	19.31	25.82
19.	Magnesium as Mg	mg/l	4.15	4.63	7.84	4.62	3.60
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	0.09	0.07	0.12	0.14	0.09
27.	Fluoride as F	mg/l	BDL	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 Detectable 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, 2012 Standard for Drinking Water.

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	*p*H value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175* or APHA 6630	—
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'accepeable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 5 Pesticide Residues Limits and Test Method

(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]

(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking:*	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system:*	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

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/2020-21/03/75	Date of Report	19/03/2021
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	09/03/2021		
Sample Location	Canteen Waste Water		

Domestic Effluent Analysis

Sr.No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	29.65	100
2	mg/l	Total Dissolved Solids	574.18	2100
3	mg/l	COD	49.74	250
4	mg/l	BOD for 3 days at 27°C	29.67	100
5	mg/l	Total Solids	603.83	------
6	mg/l	Oil and Grease	<5.00	10

ANALYZED BY

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

AUTHORIZED SIGNATORY

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 from outlet and analyzed. Results are given below.

DOMESTIC EFFLUENT ANALYSIS

Sample Location: Canteen water waste

Date of Sampling:

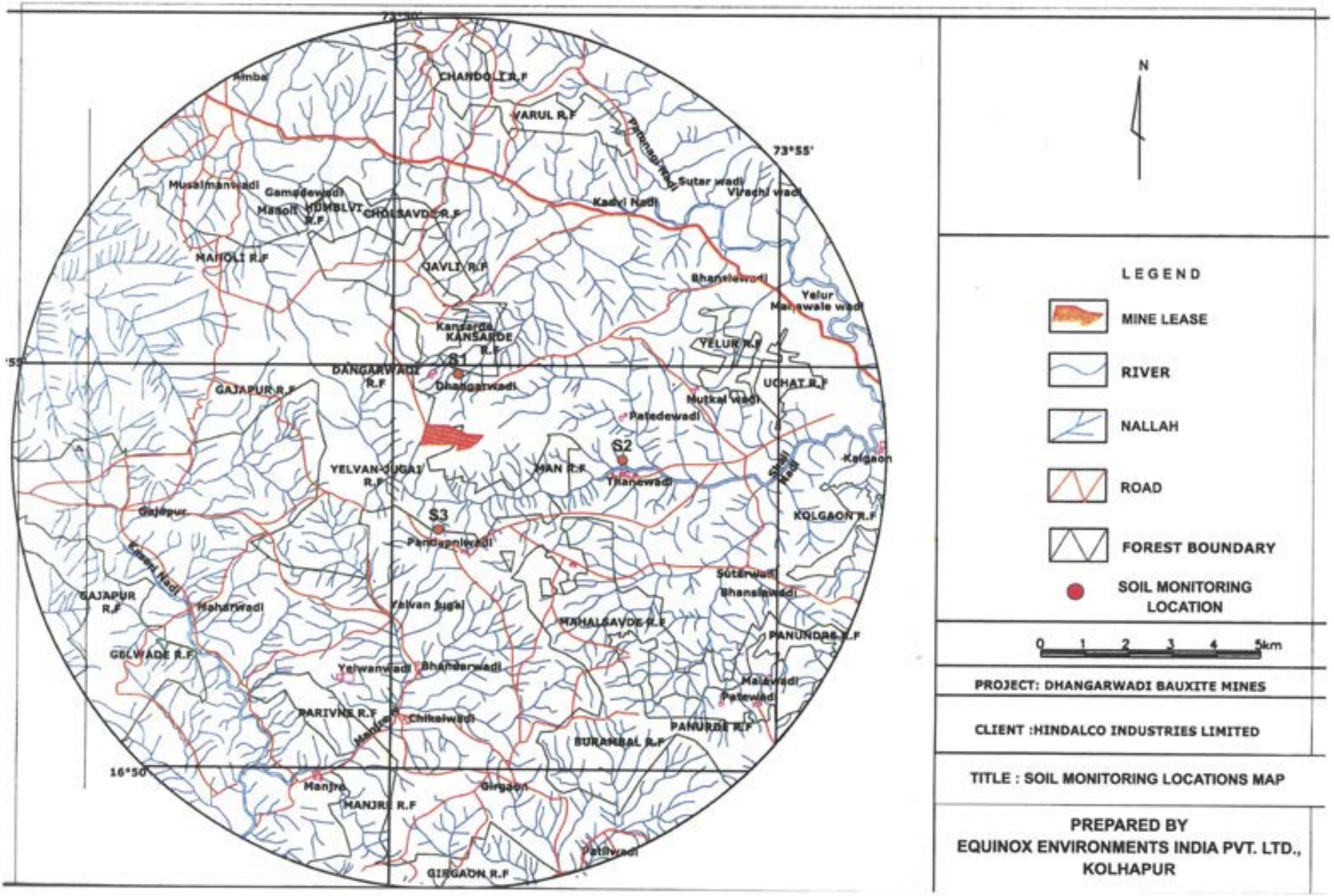
Sr. No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	29.65	100
2	mg/l	Total Dissolved Solids	574.18	2100
3	mg/l	COD	49.74	250
4	mg/l	BOD for 3 days at 27°C	29.67	100
5	mg/l	Total Solids	603.83	--
6	mg/l	Oil and Grease	<5.00	10

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.



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE : SOIL MONITORING LOCATIONS MAP

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.,
KOLHAPUR

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

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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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

Client Name:	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.	Report Number	GESEC/PRO/HIL/ 2020-21/03/212
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	11.03.2021
		Nature of sample	Soil
		Date of Sampling	04.01.2021
		Date of Sample Received	05.01.2021
		Date of Sample Analysis	05.01.2021

Sample Collected & Analyzed By : Green Envirosafe Engineers & Consultant Pvt. Ltd., Pune, Maharashtra		Locations		
Sr.No.	Test Parameters	S1- Dhangarwadi Village	S2- Thanewadi Village	S3- Pandapniwadi Village
1	pH (1:5Aq. Extraction)	7.65	8.01	7.77
2	E.C. (µs)(1:5 Aq. Suspension)	2.49	2.96	2.58
3	Nitrates (mg/kg)	42.03	71.45	52.01
4	Available Phosphorus as P_2O_5 (mg/kg)	22.41	58.23	41.12
5	Potassium as K_2O (mg/kg)	25.91	92.34	56.98
6	Available Sodium as Na_2O (mg/kg)	0.23	0.95	0.67
7	Ex. Calcium (mg/kg)	190.85	291.57	268.95
8	Ex. Magnesium (mg/kg)	92.57	150.24	114.76
9	Water Soluble Chlorides as Cl (mg/kg)	291.2	320.34	194.27
10	Organic Carbon (%)	1.52	1.95	1.65
11	Texture	Sandy Soil	Sandy Soil	Sandy Soil
	a) Sand (%)	52.00	52.00	53.00
	b) Silt (%)	10.00	11.00	13.00
	c) Clay (%)	38.00	37.00	34.00
12	Total Soluble Salts (mg/kg)	1665.20	1985.12	1728.76

ANALYZED BY

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)	7.52	7.91	7.65
2	E.C. (µs)(1:5 Aq. Suspension	2.33	2.71	2.40
3	Nitrates (mg/kg)	39.02	58.44	41.27
4	Available Phosphorus as P_2O_5 (mg/kg)	15.74	45.10	29.84
5	Potassium as K_2O (mg/kg)	12.5	70.41	46.22
6	Available Sodium as Na_2O (mg/kg)	0.34	0.87	0.59
7	Ex. Calcium (mg/kg)	169.87	256.09	230.14
8	Ex. Magnesium (mg/kg)	75.52	119.62	92.3
9	Water Soluble Chlorides as Cl (mg/kg)	251.4	264.71	169.01
10	Organic Carbon (%)	1.97	1.66	1.52
11	Texture	Sandy Soil	Sandy Soil	Sandy
	a) Sand (%)	56.00	57.00	52.00
	b) Silt (%)	12.00	10.00	10.00
	c) Clay (%)	32.00	33.00	38.00
12	Total Soluble Salts (mg/kg)	1564.39	1815.24	1609.37

DHANGARWADI
BAUXITE MINE

TAHSIL: SHAHUWADI, DISTRICT: KOLHAPUR,
STATE: MAHARASHTRA

OF

M/s HINDALCO INDUSTRIES LTD.

ENVIRONMENTAL QUALITY MONITORING REPORT

SEASON - MONSOON 2021

JUNE - JULY - AUGUST- 2021

PREPARED BY

EQUINOX
Equinox Environments (India) Pvt. Ltd.

EQUINOX ENVIRONMENTS (I) PVT. LTD.,

ENVIRONMENTAL,CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS,
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An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION

2021

INDEX

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 Monsoon season of the year 2021.

According to MoUdt. 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 was carried out in core zone and buffer zone during the Monsoon season of the year 2021. The data obtained was compiled to assess the current environmental status of the mining as well as the surrounding villages in the study area for following environmental parameters.

- Water Quality
- Domestic Effluent Quality

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 water quality in core zone and buffer zone in and around the mine lease area during the Monsoon season of the year 2021.

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.

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.

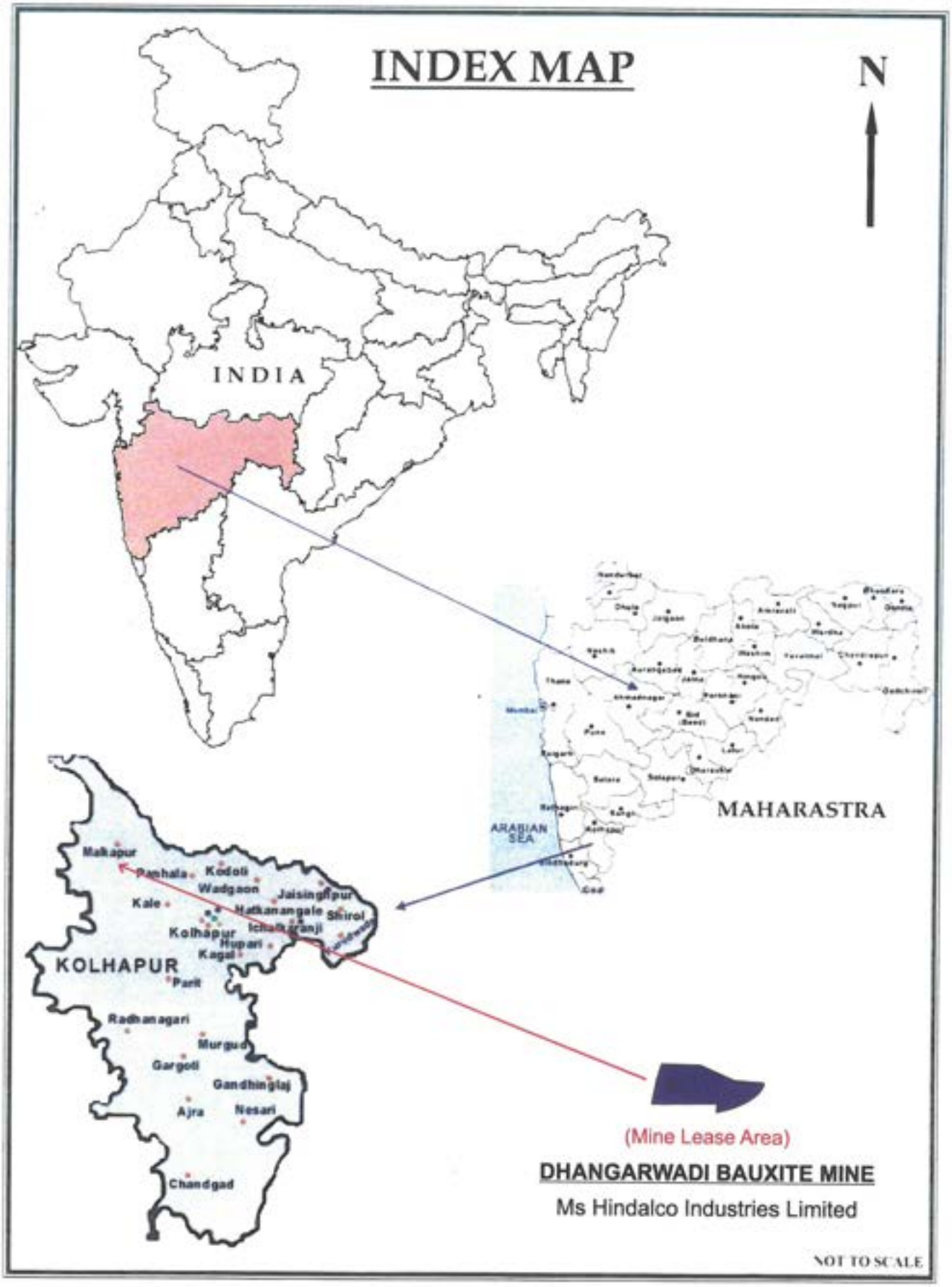
As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 41. 80 ha and the same was approved by the Indian Bureau of Mines vide letter no. MP/KLP/MAH-73-SZ, DT.11/11/2003on submission of approved mining plan Government of Maharashtra has sanctioned 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 areaon05/05/2008 and the lease expires on 04/05/2038.

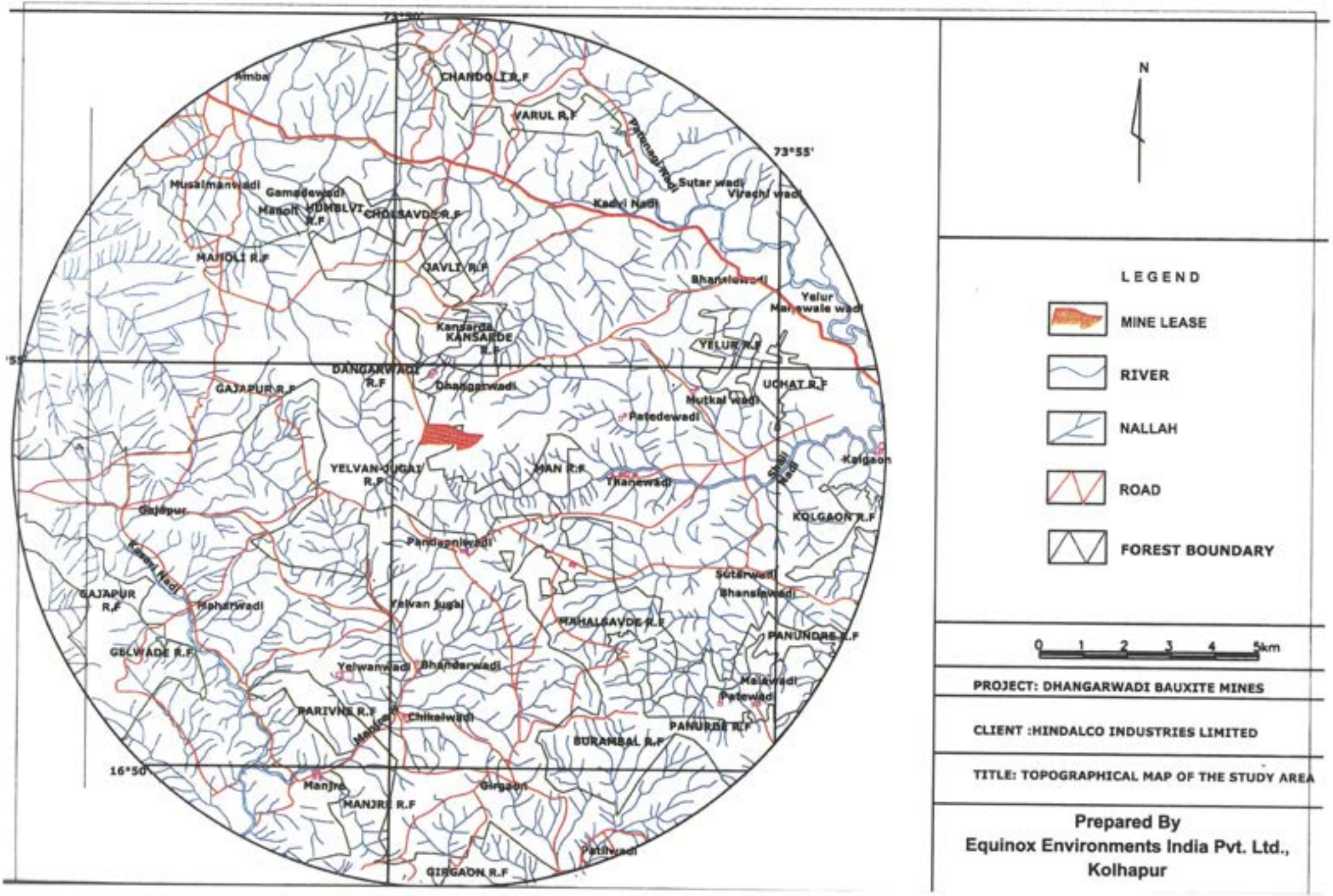
MINE DETAIL

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
Shiroi
Kolhapur
Ichalkaranji
Hupari
Kagal
Pant
Radhanagari
Murgud
Gargoti
Gandhinglaj
Ajra
Nesari
Chandgad
(Mine Lease Area)
DHANGARWADI BAUXITE MINE
Ms Hindalco Industries Limited
NOT TO SCALE



PROJECT: DHANGARWADI BAUXITE MINES

CLIENT :HINDALCO INDUSTRIES LIMITED

TITLE: TOPOGRAPHICAL MAP OF THE STUDY AREA

Prepared By
Equinox Environments India Pvt. Ltd.,
Kolhapur

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**

Note: The mining activities at Dhangarwadi Bauxite mine have been stopped due to directions received from Ministry of Environment, Forest and Climate Change on 14th February 2020.

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.

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 water quality status within core zone and buffer zone in and around the mine lease area.

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 and Ground water quality.

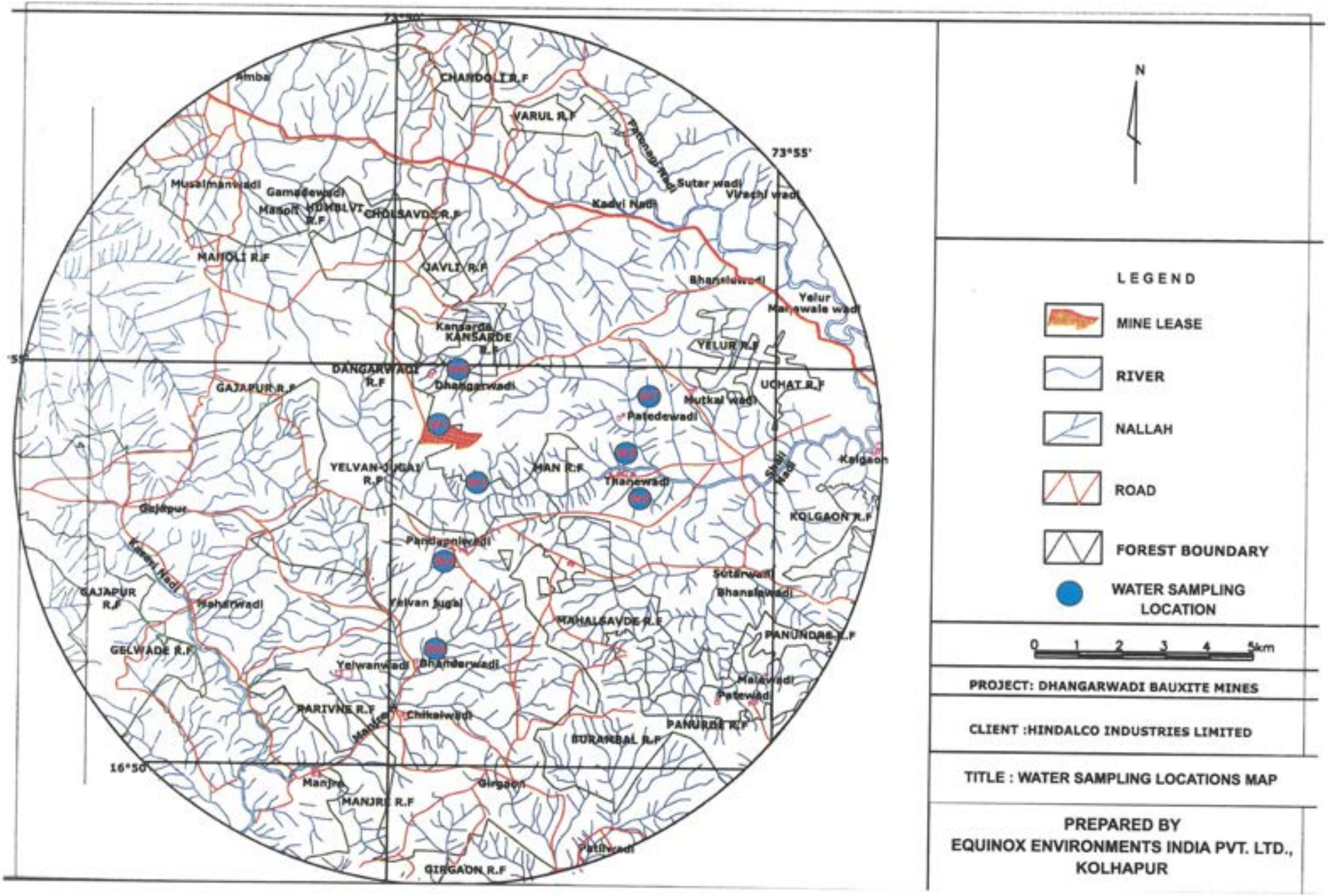
A total of 8 locations have selected, out of which 5 are for ground water and 3 are for surface water. Location of water quality monitoring stations is given below.

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, 2012 (Drinking water standard). Samples were collected in monsoon season of the year 2021 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	ShaliNadi (Up Stream)	Surface Water
W-3	ShaliNadi (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



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

GREEN ENVIROSAFE
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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/2021-22/08/817
Project Name and Address: **M/s. Hindalco Industries Limited, Dhangarwadi Bauxite Mine, Dhangarwadi Village, Shahuwadi Taluka, Kolhapur District, Maharashtra.**		**Date of Report**	**20.08.2021**
		Nature of sample	**Surface Water**
		Date of Sampling	**10.08.2021**
		Date of Sample Received	**11.08.2021**
		Date of Sample Analysis	**11.08.2021**

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

Sr. No.	Parameter	Unit(s)	Location W1 MINEPIT 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	BDL	BDL	BDL
4.	pH	--	7.25	7.05	7.14
5.	Turbidity	NTU	0.54	0.13	0.20
6.	DO	mg/lit	4.27	4.81	4.39
7.	TDS	mg/lit	183.49	143.32	157.81
8.	TSS	mg/lit	16.84	10.61	14.22
9.	BOD:3 days at 27°C	mg/lit	4.01	3.02	3.40
10.	Alkalinity as $CaCO_3$	mg/lit	20.63	13.97	16.46
11.	Total Hardness as $CaCO_3$	mg/lit	95.47	71.48	86.50
12.	Nitrate as NO_3	mg/lit	18.56	11.63	16.02
13.	Phosphorous as PO_4	mg/lit	0.66	0.16	0.43
14.	Chlorides as Cl^-	mg/lit	25.40	19.78	22.02
15.	Sulphates as SO_4	mg/lit	6.12	2.29	4.50
16.	Sodium as Na	mg/lit	8.91	3.51	3.92
17.	Potassium as K	mg/lit	10.46	6.36	7.22
18.	Calcium as Ca	mg/lit	32.42	23.78	29.08
19.	Magnesium as Mg	mg/lit	3.50	2.92	3.35
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	0.11	0.05	0.08
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

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	BDL	BDL	BDL
4.	pH	--	7.25	7.05	7.14
5.	Turbidity	NTU	0.54	0.13	0.20
6.	DO	mg/lit	4.27	4.81	4.39
7.	TDS	mg/lit	183.49	143.32	157.81
8.	TSS	mg/lit	16.84	10.61	14.22
9.	BOD:3 days at 27°C	mg/lit	4.01	3.02	3.40
10.	Alkalinity as $CaCO_3$	mg/lit	20.63	13.97	16.46
11.	Total Hardness as $CaCO_3$	mg/lit	95.47	71.48	86.50
12.	Nitrate as NO_3	mg/lit	18.56	11.63	16.02
13.	Phosphorous as PO_4	mg/lit	0.66	0.16	0.43
14.	Chlorides as Cl^-	mg/lit	25.40	19.78	22.02
15.	Sulphates as SO_4	mg/lit	6.12	2.29	4.50
16.	Sodium as Na	mg/lit	8.91	3.51	3.92
17.	Potassium as K	mg/lit	10.46	6.36	7.22
18.	Calcium as Ca	mg/lit	32.42	23.78	29.08
19.	Magnesium as Mg	mg/lit	3.50	2.92	3.35
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	0.11	0.05	0.08
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 Detectable 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, 2012 Standard for Drinking Water.

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

DHANGARWADI MINES

WELL DEPTHS OF VILLAGES

Report Number: GESEC/PRO/2021-22/08/815

Date Of Report: 20/08/2021

Date Of Sampling: 10.08.2021

Sr. NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
1	PANDAPNIWADI VILLAGE	**DHANGARWADI**	6.00	1.71
2	DHANGARWADI VILLAGE	**DHANGARWADI**	6.00	2.84

ANALYZED BY

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

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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, 2012 (Drinking water standard). A total of 5 locations have selected from buffer zone.

DHANGARWADI MINES Well Depths of Villages			
Sr. No.	**Location**	**Total Depth in Meters**	**Water Level From Surface in Meters**
1	Pandapniwadi Village	6.00	1.71
2	Dhangarwadi Village	6.00	2.84

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TEST CERTIFICATE

Client Name:	**Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.**	**Report Number**	GESEC/PRO/2021-22/08/810-814
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**	**20/08/2021**
		Nature of sample	**Ground water**
		Date of Sampling	**10.08.2021**
		Date of Sample Received	**11.08.2021**
		Date of Sample Analysis	**11.08.2021**

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	BDL	BDL	BDL	BDL	<5.00
4.	pH	--	7.22	7.02	7.3	7.14	7.17
5.	Turbidity	NTU	BDL	BDL	BDL	BDL	<5.00
6.	Dissolved Oxygen	mg/l	3.92	3.73	2.89	3.28	3.17
7.	Total Dissolved solids	mg/l	127.06	144.63	160.23	151.25	126.69
8.	Total Suspended solids	mg/l	BDL	BDL	BDL	BDL	<5.00
9.	B.O.D	mg/l	2.66	2.05	3.92	2.02	2.26
10.	Alkalinity as $CaCO_3$	mg/l	10.72	3.35	14.34	7.31	10.09
11.	Total Hardness as $CaCO_3$	mg/l	83.34	64.70	96.10	51.94	62.03
12.	Nitrate as NO_3	mg/l	17.63	7.28	13.71	10.8	15.3
13.	Phosphates as PO_4	mg/l	0.93	0.63	0.58	0.70	0.86
14.	Chlorides as Cl	mg/l	24.64	19.25	14.57	12.6	17.03
15.	Sulphates as SO_4	mg/l	10.49	8.23	7.73	5.93	4.46
16.	Sodium as Na	mg/l	7.08	5.36	6.41	3.17	5.20
17.	Potassium as K	mg/l	11.57	15.40	19.77	10.52	12.90
18.	Calcium as Ca	mg/l	25.92	20.92	28.93	17.1	19.01
19.	Magnesium as Mg	mg/l	4.50	3.01	5.77	2.23	3.52
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	0.10	0.04	0.15	0.01	0.16
27.	Fluoride as F	mg/l	0.02	BDL	0.01	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

ANALYZED BY

AUTHORIZED SIGNATORY

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see* **4.1**), virological requirements (*see* **4.2**) and biological requirements (*see* **4.3**).

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters
(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, *Max*	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	*p*H value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, *Max*	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, *Max*	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause **6** of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, *Max*	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, *Max*	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, *Max*	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, *Max*	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, *Max*	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, *Max*	0.000 5	No relaxation	ASTM 5175*	— or APHA 6630
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, *Max*	0.000 1	No relaxation	APHA 6440	—
x)	Total arsenic (as As), mg/l, *Max*	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
	a) Bromoform, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	b) Dibromochloromethane, mg/l, *Max*	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
	c) Bromodichloromethane, mg/l, *Max*	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
	d) Chloroform, mg/l, *Max*	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances

(*Foreword* and *Clause* 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
	a) Alpha emitters Bq/l, *Max*	0.1	No relaxation	Part 2	—
	b) Beta emitters Bq/l, *Max*	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 5 Pesticide Residues Limits and Test Method

(*Foreword* and *Table* 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA	AOAC/ ISO
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyriphos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (*o, p* and *p, p* – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproteron	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water[1)]

(*Clause* 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	*All water intended for drinking*:	
	a) *E. coli* or thermotolerant coliform bacteria[2), 3)]	Shall not be detectable in any 100 ml sample
ii)	*Treated water entering the distribution system*:	
	a) *E. coli* or thermotolerant coliform bacteria[2)]	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	*Treated water in the distribution system*:	
	a) *E. coli* or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
	b) Total coliform bacteria	Shall not be detectable in any 100 ml sample

[1)]Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

[2)]Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

[3)]It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

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GESEC

Domestic Effluent Analysis Report			
Report No.	GESEC/PRO/2021-22/08/816	**Date of Report**	**20/08/2021**
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	**10.08.2021**		
Sample Location	**Canteen Waste Water**		

Domestic Effluent Analysis

Sr. No.	Unit	Parameter	Result	MPCB Standards	Analysis Method
1	mg/l	Total Suspended Solids	23.52	100	APHA 2540 D
2	mg/l	Total Dissolved Solids	512.10	2100	APHA 2540 C
3	mg/l	COD	32.69	250	APHA 5210 B
4	mg/l	BOD for 3 days at 27°C	13.45	100	APHA 5220 B
5	mg/l	Total Solids	535.62	------	APHA 2540 D
6	mg/l	Oil and Grease	<5.00	10	APHA 5520 B

ANALYZED BY

GREEN ENVIROSAFE PUNE Engineers & Consultant Pvt. Ltd.

AUTHORIZED SIGNATORY

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 from outlet and analyzed. Results are given below.

DOMESTIC EFFLUENT ANALYSIS

Sample Location: Canteen water waste

Date of Sampling:

Sr. No	Unit	Parameter	Result	MPCB Standards
1	mg/l	Total Suspended Solids	23.52	100
2	mg/l	Total Dissolved Solids	512.10	2100
3	mg/l	COD	32.69	250
4	mg/l	BOD for 3 days at 27°C	13.45	100
5	mg/l	Total Solids	535.62	--
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.