BEFORE THE NATIONAL GREEN TRIBUNAL,

WESTERN ZONE, PUNE

ORIGINAL APPLICATION NO 222 OF 2023

Mrs Mangal Vishnu Bodke & 4 others ....Applicant

Vs

Matrix Lifescience Pvt Ltd and 3 others ... Respondents

AFFIDAVIT ON BEHALF OF RESPONDENT NO 2

I, Achyut S. Nandvate, aged about 53 years, Occupation-service, the Sub-Regional Officer of the Maharashtra Pollution Control Board, having my office at Paryavaran Bhavan Plot No A-4/A, MIDC, Chikhalthana, Sambhajinagar, do hereby state on solemn affirmation as under :-

1. I say and submit that the Board has filed multiple affidavits in compliance of the order passed by this Hon'ble Tribunal Order dated 08.08.2024 wherein it was submitted that VNIT will collect samples of ground water in the vicinity of MIDC Paithan and comprehensive report of "Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Paithan MIDC area, Chhatrapati Sambhajinagar" will be submitted. The progress report about collection of water samples & preparation of comprehensive report was submitted by Respondent No. 2 from time to time.

2. I say and submit that Visvesvaraya National Institute of Technology, Nagpur has submitted the final report of "Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Paithan MIDC area, Chhatrapati Sambhajinagar" on April 25,2025. A copy of the email received from VNIT, Nagpur dated 25.4.2025 is enclosed and marked as an **Annex I**. A copy of the report received from VNIT is enclosed and marked as an **Annex II** .

3. I say and submit that the report of "Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Paithan MIDC area, Chhatrapati Sambhajinagar" received from VNIT, Nagpur is submitted vide email dated 06/06/2025 to The District Agriculture Officer, Chh Sambhajinagar , a nodal officer of the committee comprising of District Collector, Chh Sambhajinagar, the District Agriculture Officer, Chh Sambhajinagar and the Central Pollution Control Board (CPCB) for the assessment of the damage caused to the agricultural crops or lands of the applicant. A copy email communication to The District Agriculture Officer, Chh Sambhajinagar is enclosed and marked as an **Annex III.**

4. I say and submit that the committee comprising of District Collector, Chh Sambhajinagar, the District Agriculture Officer, Chh Sambhajinagar and the Central Pollution Control Board (CPCB) will prepare comprehensive report about the assessment of the damage caused to the agricultural crops or lands of the applicants.

In view of above, it is prayed that Committee report on damage caused to the agricultural crops or lands of the applicants will be submitted immediately for kind perusal after its receipt from The Committee headed by The District Collector, Chh Sambhajinagar.

Solemnly affirmed on 16th June 2025.

For and on behalf of MPCB

(Achyut S. Nandvate)
Sub - Regional Officer-Chh Sambhajinagar

AFFIDAVIT

Solemnly affirmed before me
by Shri / Smt. Achyut Shivrao Nandvate
R/o. Sub Regional office MPCB age 53 yrs
Tq. Chikalthana Dist. Chh.S.N. occupation
Who identified by Sambhajinagar
Whom He/ She is personally Known.

NOTED & REGISTERED
AT Sr. No. 3938 / 2025
THIS DOCUMENT CONTAINS
9 (Nine) PAGES

16 JUN 2025

BEFORE ME

S.N. SOLUNKE
B.Com., LL.M., G.D.C.&A.
Advocate Notary Govt. of India
AREA-AURANGABAD DIST'S
☎:(M) 9822530054
Reg. No. 9023

IDENTIFIED BY
Shri / Smt. Akshay Paithane
R/o Chh Sambhajinagar

NOTARY
S.N. SOLUNKE
AREA CHHATRAPATI SAMBHAJINAGAR (AURANGABAD) DISTRICT
Reg. No. 9023
Exp.Dt.20-10-2026
GOVT. OF INDIA

Annex I

Outlook

Final report of MIDC Paithan.

From Dr. Karthik Balasundaram <karthik@civ.vnit.ac.in>
Date Fri 25-04-2025 16:46
To Ravindra Andhale <jdair@mpcb.gov.in>
Cc SRO Chhatrapati Sambhaji Nagar <srochhatrapatisambhajinagar1@mpcb.gov.in>; Dr. A.B Mirajkar <abmirajkar@civ.vnit.ac.in>; DR. DILIP H. LATAYE <dhlataye@civ.vnit.ac.in>; RO Chhatrapati Sambhaji Nagar <rochhatrapatisambhajinagar@mpcb.gov.in>

1 attachment (14 MB)
MIDC Paithan report signed.pdf;

Dear Sir,
With respect to the work order issued through letter no BO/JD(APC)/TB/B-0037 dt. 1st July 2024, please find attached the signed report of **"Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Paithan MIDC area, Chhatrapati Sambhajinagar".**

5 copies of the report are sent to your office by post. Kindly acknowledge the same.

--
Best Regards,

KARTHIK BALASUNDARAM (Ph.D.),
ASSISTANT PROFESSOR
DEPARTMENT OF CIVIL ENGINEERING,
VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY,
SOUTH AMBAZARI ROAD,
NAGPUR-440010
INDIA
Tel: 0712-280-2249
homepage: https://vnit.ac.in/engineering/civil/dr-karthik-balasundaram/

Annex II

NO.: CIVIL/CEC-1066/DHL-77 (1)
April 23, 2025

Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Paithan MIDC area, Chhatrapati Sambhajinagar.

Prepared by:
Dr. Karthik Balasundaram
Dr. Ashwini B. Mirajkar
Dr. Dilip H. Lataye

Department of Civil Engineering
Visvesvaraya National Institute of Technology, Nagpur

Submitted to:

Maharashtra Pollution Control Board (MPCB)

Mumbai

1. Introduction

1.1. Background

Maharashtra Pollution Control Board (MPCB) through letter No. BO/JD(APC)/TB/B-0037 dated 1st July 2024 had issued workorder to VNIT Nagpur for preparation of **"Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Painthan MIDC area, Chhatrapati Sambhajinagar."**

This document constitutes the detailed report on the environmental damages and suitable recommendations.

1.2. Scope of work

- Detailed survey of the study area.
- Three-decade Land use, Land cover study.
- GIS mapping of the study area.
- Topographical study of the project area.
- Detailed assessment of the groundwater contamination.
- Report submission.

1.3. Methodology

Dr. Dilip H. Lataye, Professor, Dr. Ashwini B. Mirajkar, Associate Professor and Dr. Karthik Balasundaram, Assistant Professor, from Department of Civil Engineering, VNIT Nagpur visited the site MIDC Paithan along with MPCB officials on 24th August 2024 and 6th January 2025. The property is an industrial area with predominantly pharmaceutical companies. The methodology to assess the environmental damage involved the following:

1. Visual inspection was carried out throughout the site for assessment of environmental loss with respect to all the possible environmental and ecological factors.
2. Desk based review of documents to check for the various compliances and to evaluate the historic data.
3. Collection of ground water samples from wells and other water bodies within aerial distance of 3 km from MIDC Paithan boundary.
4. Testing of the water samples for the following parameters at an NABL lab:
   4.1. Physical Characteristics: pH, colour, oil and grease, total solids, total dissolved solids, electrical conductivity

2. Project Site Details

Name of Site	MIDC Paithan
Location	Taluka: Paithan District: Chatrapati Sambhaji Nagar State: Maharashtra
Coordinates	19°33'25" N & 19°31'45" N latitude & 75°22'45" E & 75°23'15" E
Area	285 Ha
Eco-sensitive areas	Jaikwadi Bird Sanctuary and Jaikwadi Dam (<3km from the southern boundary)
Current land use	Industrial/Commercial
No of industries (at present)	24

2.1. Site Topography

The topographic survey included picking up of all details and features as existing on ground within the MIDC boundary. The survey was carried out using latest survey instruments having required precision with computerized data capture facility like Total Station and Auto Levels. All data related to topography and features of the ground were recorded using on board data loggers.

The site is a flat terrain with the ground sloping from east to west. The highest elevation is 401.75m towards the North eastern side and the lowest elevation observed is 389.25 towards the south western side of the site. No major landforms are present within the site area. The state highway 752E runs along the eastern boundary of the MIDC.

The Jaikwadi dam and Jaikwadi bird sanctuary are located within an aerial distance of 3 km from the east and south boundary of the MIDC.

3. Land Use and Land Cover (LULC) Change Analysis (1996-2023)

3.1. Data Overview

The study considers five major LULC classes:

- Waterbody
- Agriculture Land
- Bare Land
- Tree/Forest
- Urban Settlement

Data was collected for 1996, 2003, 2011, 2017, 2020, and 2023, providing a comprehensive view of changes over time.

3.2. Analysis Approach

The land use and land cover classes were identified and their areal extent were listed in Table 1. Changes in various land use and land cover classes were analyzed, their trend was constructed, their percentage changes were evaluated and finally, their comparative analysis was reported in the result section. **Figure 1** and **Figure 2** shows the land use and land cover maps for various years.

Table 1. Various land use and land cover classes and their areal coverage in square kilometers.

Sr. No.	LULC Classes	Y1996	Y2003	Y2011	Y2017	Y2020	Y2023
1	Waterbody	0	0	0.31	0.41	0.53	0.22
2	Agriculture Land	9.88	10.68	10.39	11.64	11.32	11.31
3	Bare Land	0.22	0.24	0.23	0	0	0
4	Tree/Forest	3.14	2.39	1.89	0.6	0.01	0.01
5	Urban Settlement	2.85	2.78	3.29	3.99	4.24	4.58

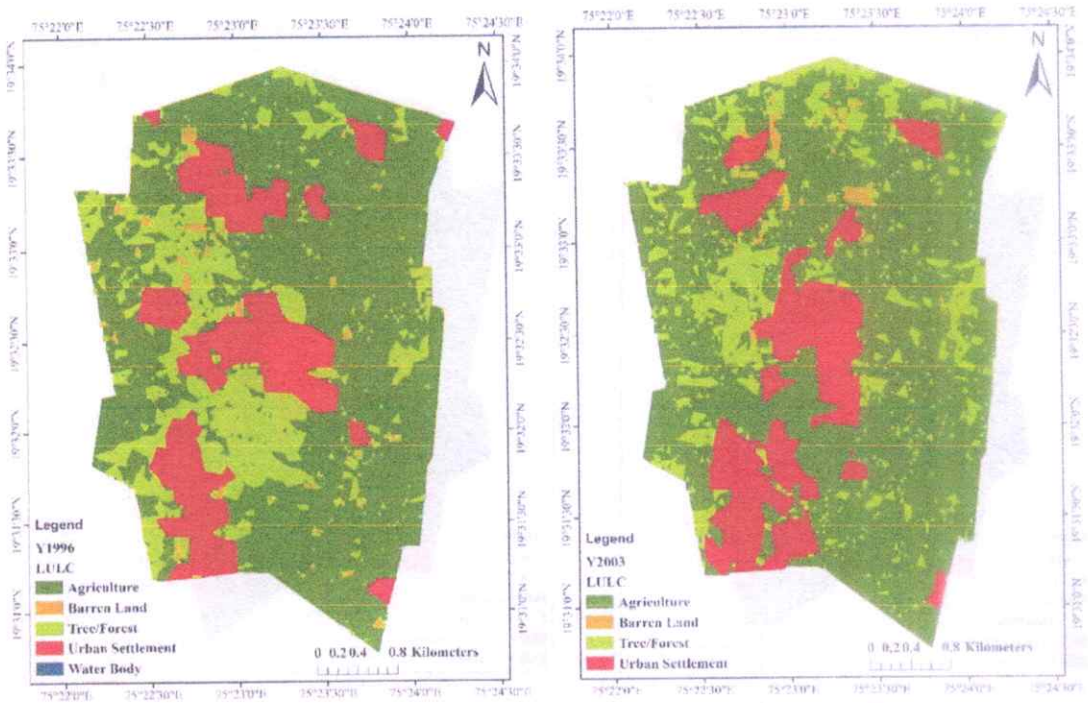


Figure1. Land use and land cover map of 1996 and 2003.

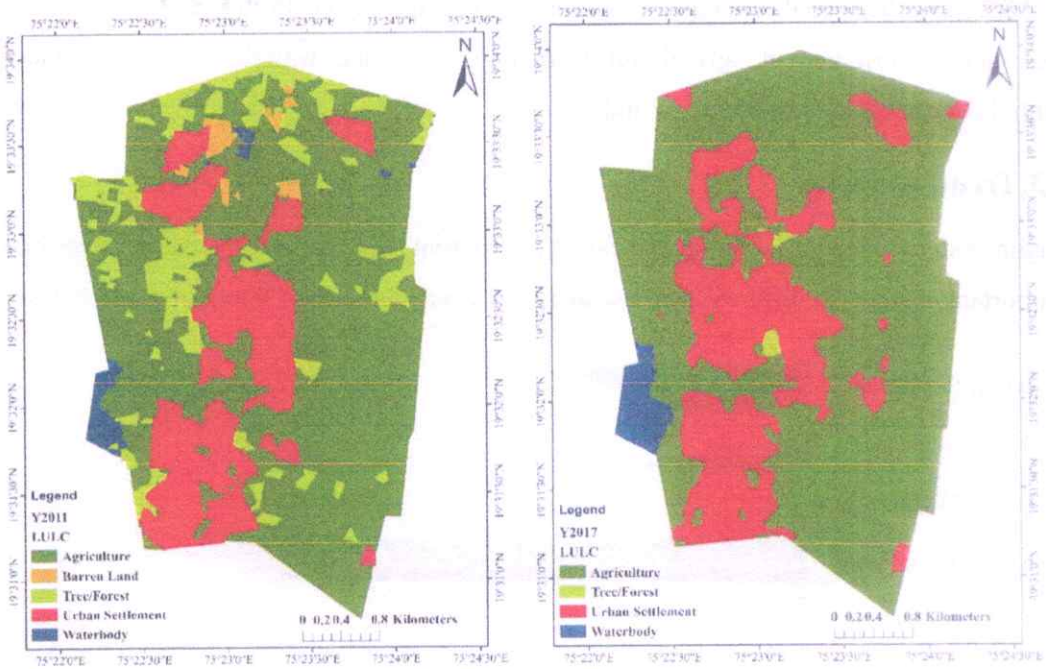


Figure 2. Land use and land cover map of 2011, 2017, 2020 and 2023.

Figure 1&2 show the spatial coverage of various LULC classes from 1996 to 2023. Noticeable changes can be observed in agricultural land, bare land, and waterbodies, which faced substantial changes during the study period.

3.3. Trend Analysis

Figure 3 shows changes in the spatial extent of different land use and land cover categories. Important changes in different land use and land cover classes are summarized as below:

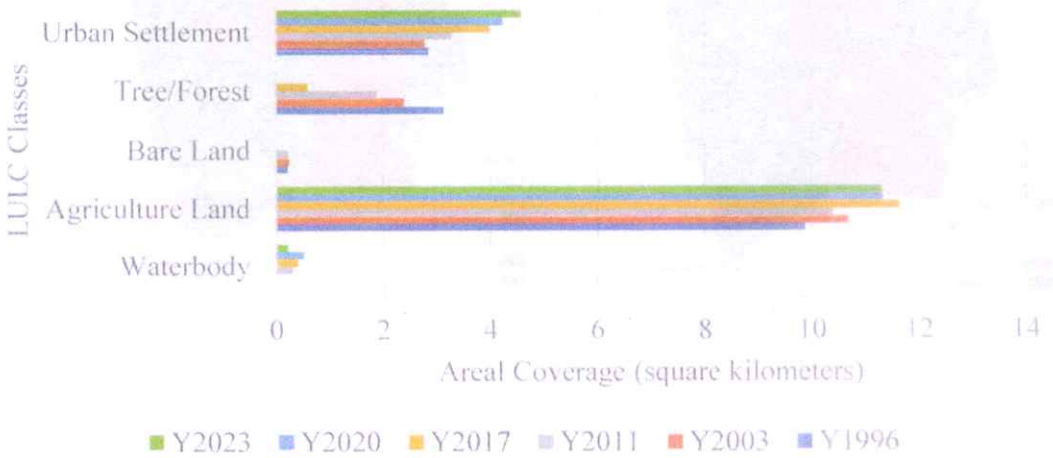


Figure 3. Graphical representation of areal extent of different land use and land cover classes in different years.

Below are the variations in the different land use land covers expressed in square kms.

3.1 Agriculture Land

- Increased from **9.88 in 1996 to 11.3 in 2023**.
- Steady rise observed, with a peak in **2017 at 11.64**.

3.2 Bare Land

- Declined from **0.22 in 1996 to 0 by 2017**, remaining absent afterward.
- Indicates a complete transformation or repurposing of bare land.

3.3 Tree/Forest

- Sharp decline from **3.14 in 1996 to 0.0001 in 2023**.
- Notable decrease between **2017 and 2020 (99.94% reduction)**.

3.4 Urban Settlement

- Increased from **2.85 in 1996 to 4.58 in 2023**.
- Continuous growth, especially between **2011 and 2023**.

3.5 Waterbody

- Grew from **0.0001 in 1996 to 0.53 in 2020**, showing expansion of waterbodies.
- Slight decline to **0.22 in 2023**, possibly due to reclassification, land repurposing, or the time of satellite imagery obtained.

4. Percentage Change Analysis

- **Waterbody:** Waterbody appeared in the study area in 2011. Then, it increased nearly 70.96% from 2011 to 2020, and then slightly declined.
- **Agriculture Land:** It faced a 14.47% increase from 1996 to 2023 continuously.
- **Bare Land:** This class was present till 2011, then it almost disappeared.
- **Tree/Forest:** This LULC class also faced continuous and rapid reduction, and it vanished nearly 99.99% during the study period.
- **Urban Settlement:** This LULC class shows a continuous increase during the study period. Overall, it nearly doubled in the year 2023 (reportedly found to be increased by 60.70%)

5. Comparative Analysis (1996 vs. 2023)

- Waterbody increased by 0.22 square kilometres.
- Agriculture Land increased by 14.47%.
- Bare Land nearly vanished.
- Tree/Forest also nearly disappeared, acquiring only 100 square meters.

4.2. Chemical Characteristics: Chlorides, sulphates, COD, ammonical nitrogen, TKN, nitrates, total phosphorus, and tannin.

4.3. Phenolic compounds.

4.4. Metals: Cu, Ag, Fe, Cd, Pb, Hg, Ni, Zn, As, Mn, total chromium, Se

4.5. Biological Characteristics: BOD, fecal coliforms

5. For Land Use and Land Cover study:

5.1. Landsat 8 satellite images for the years 1996, 2003, and 2011 (30m resolution) were obtained from the USGS Earth Explorer website. The satellite images were pre-processed and clipped to the study area using ArcGIS 10.5. A supervised classification method was used to identify five land use and land cover classes. The maximum likelihood classifier technique was employed to attain 80% classification accuracy.

5.2. Sentinel 2 satellite land use and land cover product from 2014-2023 (10m resolution) were downloaded from the Environmental Systems Research Institute (the ESRI website:https://livingatlas.arcgis.com/landcoverexplorer/#mapCenter=-117.20000%2C34.06000%2C11&mode=step&timeExtent=2017%2C2023&year=2023). The land use and land cover classes were reclassified into five categories to understand the historical changes in land use and land cover classes.

- Urban Settlement grew by 60.70%, indicating urban growth and land conversion into paved surfaces.

6. Conclusion

The analysis highlights significant changes in land cover over the past 27 years. The most notable observations include the disappearance of bare land and tree/forest land, the expansion of agricultural land and increasing urban settlement growth. These trends may be linked to environmental policies, urban development, and climate change factors.

Further research is recommended to assess the underlying causes and implications of these shifts, particularly the decline of bare land and urban settlement fluctuations.

4. Ground water contamination Analysis

4.1.Sample collection and Analysis

Water samples were collected from 22 existing dug wells and 1 borewell within an aerial distance of 3km from the boundary of MIDC. The map with well location and the well coordinates is given in Annexure-1 and Annexure 1A respectively. Water samples from the well number 18 and borewell number 17 are considered as baseline samples. The photographs of the wells along with GPS location are given in Annexure-2. The sample were analysed for various parameters. The results are mentioned in Annexure-3.

4.2.Spatial distribution of contaminants

The spatial distribution of compounds detected above the IS limits were analysed using the Inverse Distance Weighted (IDW) interpolation method in ArcGIS 10.5. IDW interpolation estimates values for unsampled locations by assigning weights based on the inverse of the distance between sample points. This approach assumes that nearby points have a greater influence on the estimated value than those farther away (Shepard, 1968). This technique is widely used in environmental studies, hydrology, and soil science due to its simplicity and effectiveness in handling spatial data with irregular sampling distributions (Johnston et al., 2001).

The IDW method in ArcGIS applies the following equation to interpolate values at unsampled locations:

$$Z(x) = \frac{\sum_{i=1}^{n} \frac{Z_i}{d(x, x_i)^p}}{\sum_{i=1}^{n} \frac{1}{d(x, x_i)^p}}$$

In the IDW interpolation equation, z(x) represents the estimated value at the target location x, while Z_i denotes the observed value at a given sampling site ii. The term $d(x, x_i)$ signifies the distance between the target location x and the sampling point i. The parameter p is the power coefficient, which determines the influence of each sample point based on its distance from the target location.

IDW calculates the weighted average of observed values, where weights are assigned inversely proportional to the distance raised to the power pp. By default, IDW interpolation in ArcGIS Pro applies a power value of p= 2, which is commonly used in spatial analysis due to its balanced emphasis on both nearby and distant points (Johnston et al., 2001).

The following parameters were found above the prescribed limits as per IS10500:2012: ***Arsenic, Cadmium, Chloride, Faecal Coliform, Manganese, Mercury, Nickel and TDS***. The spatial mapping of the pollutant concentration is shown in Annexure-4.

4.3. Observations

Based on the results the following observations can be made:

1. The baseline concentrations of the metals Arsenic, Cadmium, Manganese, Mercury and Nickel are higher than the permissible limit. The presence of these metals may be due to natural geogenic sources. The application of metal rich pesticide, herbicides and fungicides in the agricultural fields also serves as a potential metal source in the groundwater. Since the study area lies in an agricultural belt, the large-scale use of fertilizers and fungicides in the cultivated fields is common. As can be seen from the photographs, all the wells are open dug wells without any protection. Therefore, the possibility of these metals entering into dug wells through surface run-off cannot be ruled out.
2. Most of the groundwater samples show high level of faecal coliform concentration. This indicates that the well water has been contaminated by animal and human waste.
3. Most of the well water has high concentration of chlorides and TDS. Discharge from septic systems may contribute to elevated chloride levels in the well water. Further, as seen from the map, the high levels of chloride are found in the vicinity of the MIDC boundary. Thus, there is a possibility that the elevated chloride levels may also be due to industrial activities, particularly those involving chemical processes, can release chloride-containing wastewater.

5. Conclusions

A team from VNIT Nagpur comprising Dr. Dilip H. Lataye, Professor, Dr. Ashwini B. Mirajkar, Associate Professor and Dr. Karthik Balasundaram, Assistant Professor, from Department of Civil Engineering visited the site MIDC Paithan along with MPCB officials on 24th August 2024 and 6th January 2025. Based on the observations the following conclusions can be made:

1. There have been significant changes in land cover over the past 27 years.
2. The change in land use may be linked to environmental policies, urban development, and climate change factors.
3. Further in-depth study is recommended to assess the underlying causes and implications of these shifts, particularly the decline of bare land and urban settlement fluctuations.
4. Most of the dug wells do not meet the required standards for the sanitation and protection. The wells do not have boundary walls to prevent surface run-off and other organic matter from mixing with the well water.
5. The groundwater in the vicinity of the site contains high concentrations of Arsenic, Cadmium, Manganese, Mercury and Nickel. The elevated concentrations could be due to natural geogenic origin or mixing of agricultural run-off and industrial wastewater with well water.
6. The well waters contain significant concentration of faecal coliforms. This indicates that human and animal waste is getting mixed with well water. This also highlights the poor sanitation aspects of the wells.
7. Most of the well water has high concentration of chlorides and TDS. The high levels of chloride are found in the vicinity of the MIDC boundary. Thus, there is a possibility that the elevated chloride levels may be due to industrial activities, particularly those involving chemical processes, that can release chloride-containing wastewater.
8. Discharge from septic tank systems may contribute to elevated chloride levels in the well water.
9. ***Based on the current study, it is not possible to pin point the exact reason for the elevated concentrations of various contaminants. Both the insanitary conditions of the wells and industrial activity in the vicinity of the wells could be the reason for the elevated concentrations of various contaminants.***

V. N. I. T. Civil Engg. Deptt. NAGPUR

6. Recommendations

The study makes the following recommendations:

1. It is highly recommended that all the wells be constructed as per the *"OPERATION AND MAINTENANCE MANUAL FOR RURAL WATER SUPPLIES"* published *by the* Ministry of Drinking Water and Sanitation, Government of India. This is necessary to prevent the runoff and debris from entering into the well.
2. An in-depth audit be conducted on all the industries to assess the groundwater pollution causing potential of the industries. This is necessary to identify the source of pollution from industries and to suggest effective remediation efforts.

Dr. Karthik Balasundaram **Dr. Ashwini B. Mirajkar** **Dr. Dilip H. Lataye**

25/04/2025

Dr. Dilip H. Lataye
(Head, Civil Engineering Department)

25.4.25

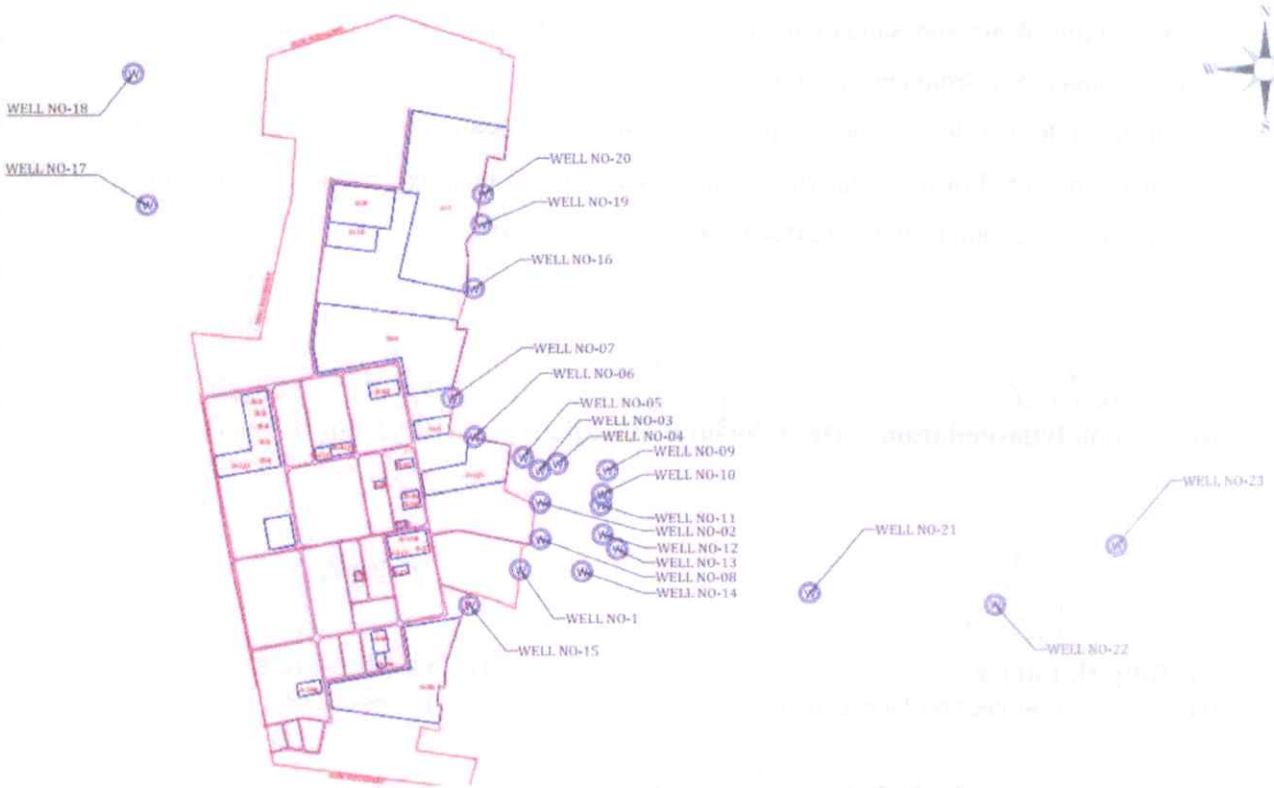
Dr. Yashwant B. Katpatal
(Professor & Dean (R&C))

Note: This report has been prepared based on the observations during the visit on site and the data, information and clarifications made available by the MPCB. VNIT shall not be responsible for any consequences due to incorrect data/ information furnished by MPCB or due to any reasons beyond the control of VNIT. This report shall not form a document in any dispute/litigation.

V. N. I. T. Civil Engg. Deptt. NAGPUR

Annexure-1

Location of wells with respect to MIDC boundary



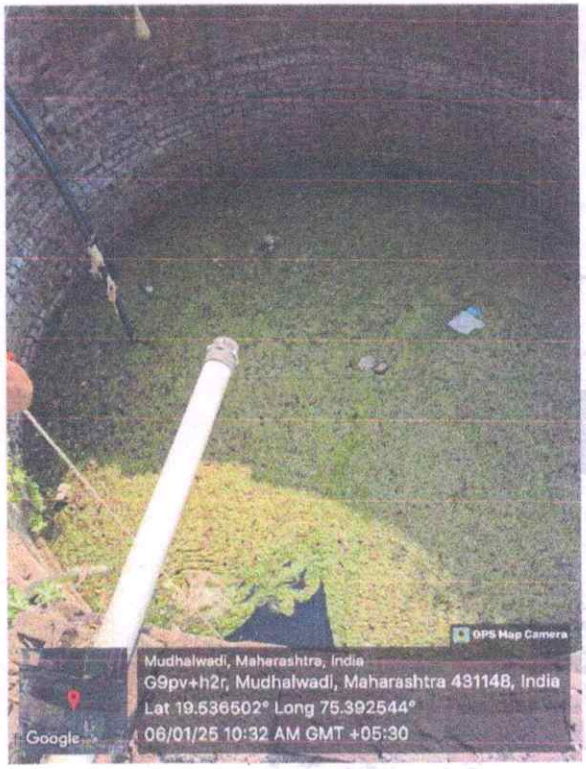
Annexure-1A

WELL LOCATION CO-ORDINATES

SR.NO	EASTING	NORTHING	REMARKS
1	541182.0649	2160241.411	WELL NO - 01
2	541262.1198	2160515.154	WELL NO - 02
3	541260.4402	2160642.374	WELL NO - 03
4	541331.092	2160669.511	WELL NO - 04
5	541193.0891	2160694.006	WELL NO - 05
6	540997.089	2160776.084	WELL NO - 06
7	540906.7543	2160936.976	WELL NO - 07
8	541263.4788	2160366.243	WELL NO - 08
9	541532.9255	2160642.569	WELL NO - 09
10	541511.5952	2160548.328	WELL NO - 10
11	541506.7319	2160505.081	WELL NO - 11
12	541514.571	2160384.913	WELL NO - 12
13	541574.0283	2160325.271	WELL NO - 13
14	541432.0131	2160233.528	WELL NO - 14
15	540977.8916	2160095.461	WELL NO - 15
16	540994.6689	2161383.944	WELL NO - 16
17	539677.3851	2161726.718	WELL NO - 17 (Borewell)
18	539622.945	2162262.241	WELL NO - 18
19	541024.8755	2161646.779	WELL NO - 19
20	541031.1041	2161772.908	WELL NO - 20
21	542348.4087	2160144.69	WELL NO - 21
22	543097.1818	2160096.118	WELL NO - 22
23	543586.6263	2160337.317	WELL NO - 23

Annexure-2

Photographs of well



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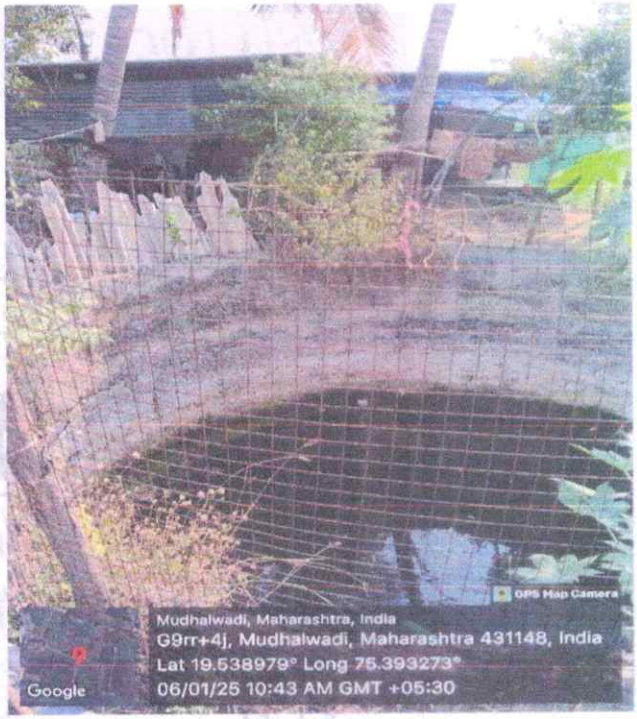
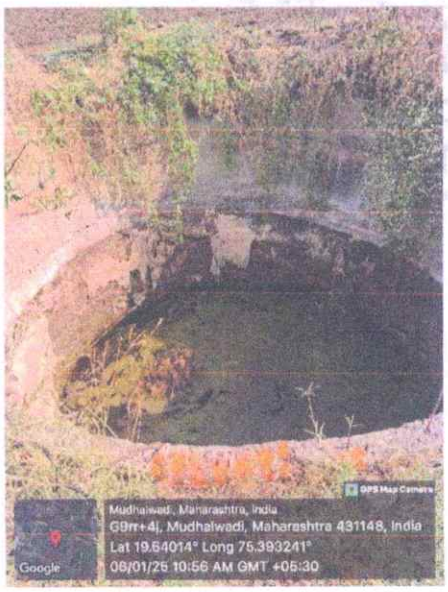


Well -2

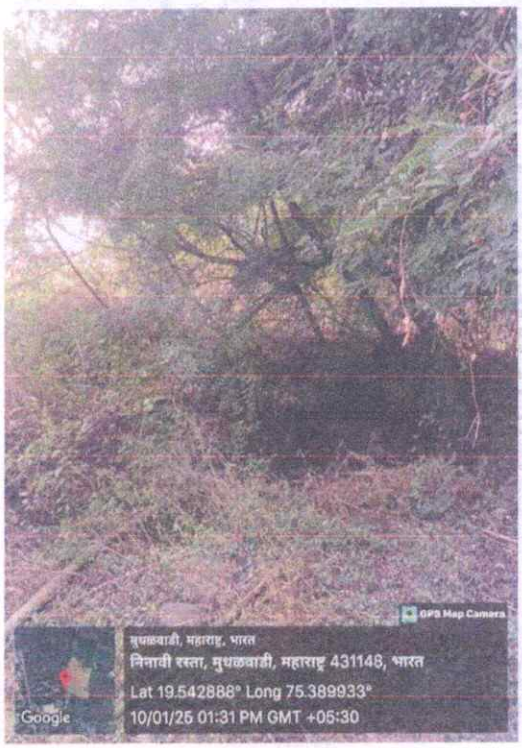


Well -3

Well -4

Well -5

Well -6



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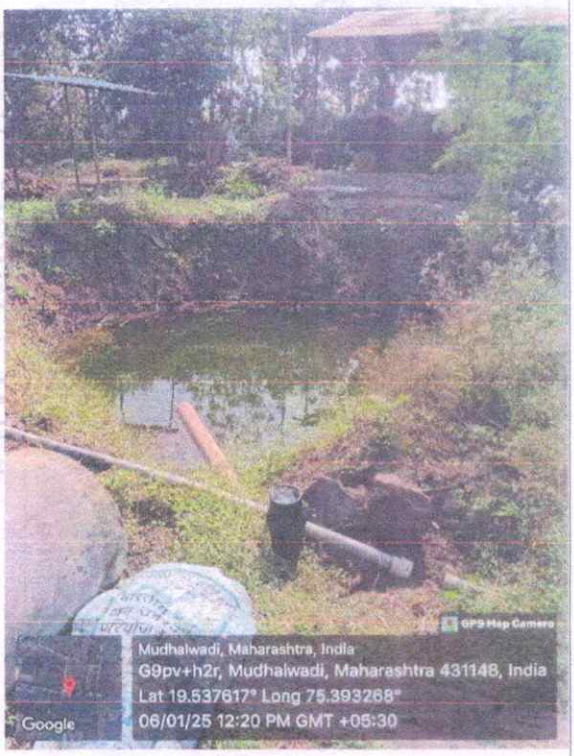

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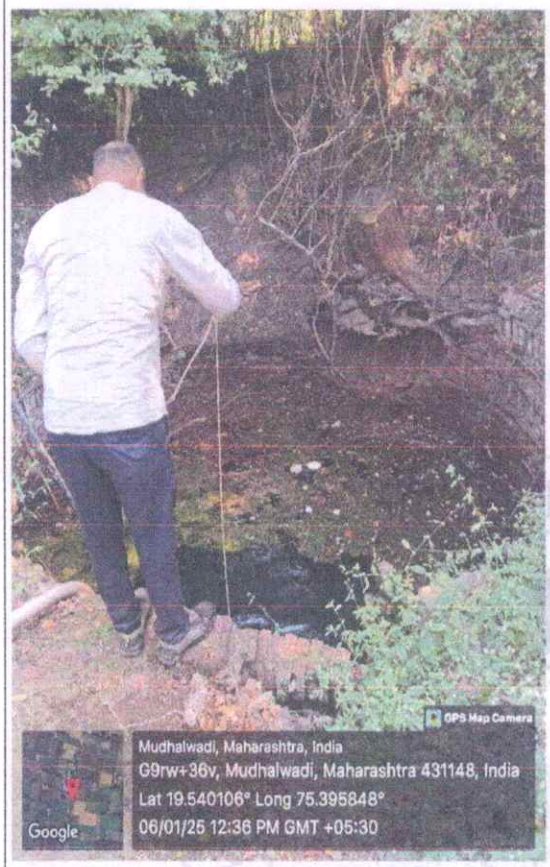
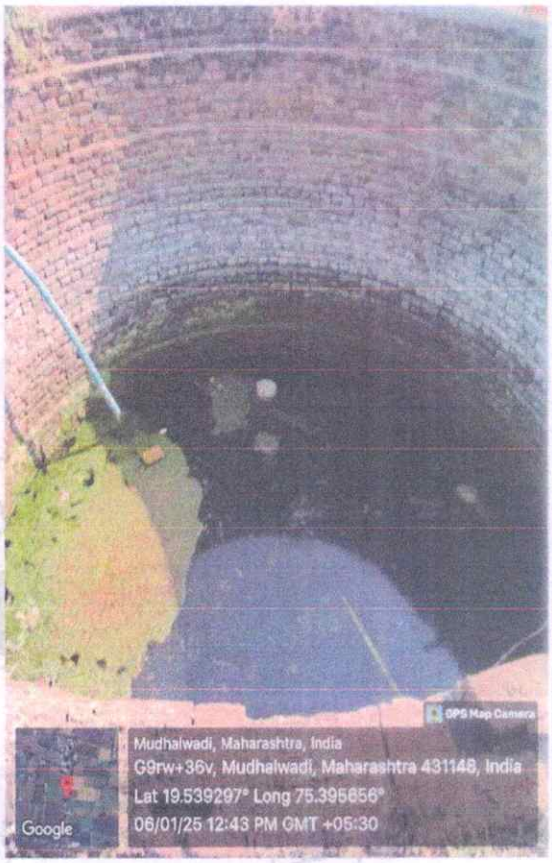


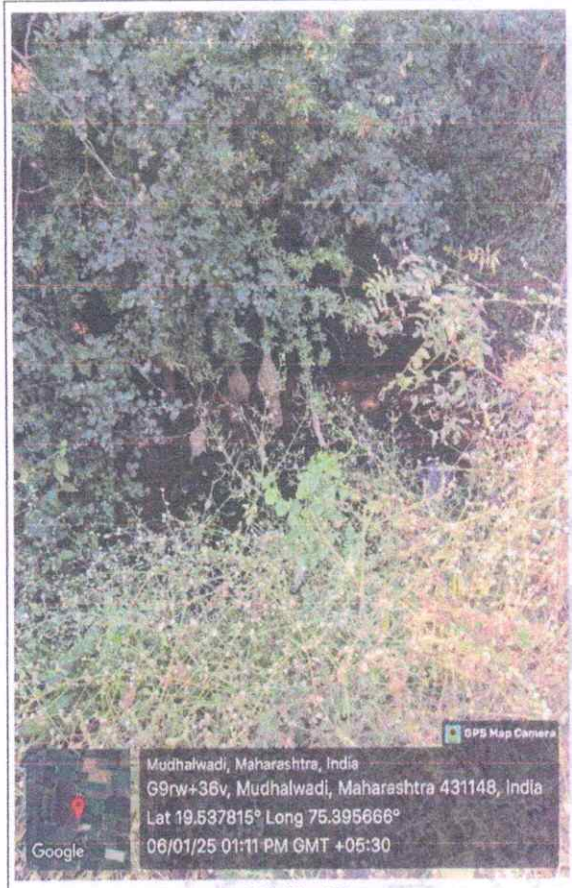
Well 9



Well -10

Well -11

Well -12



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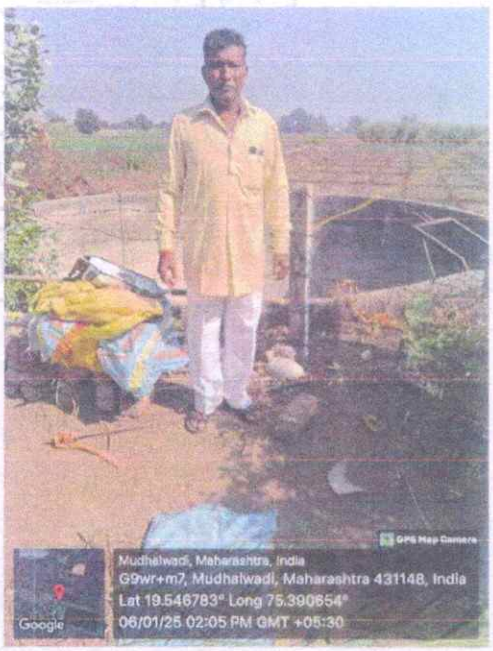
Well -14

Well -15



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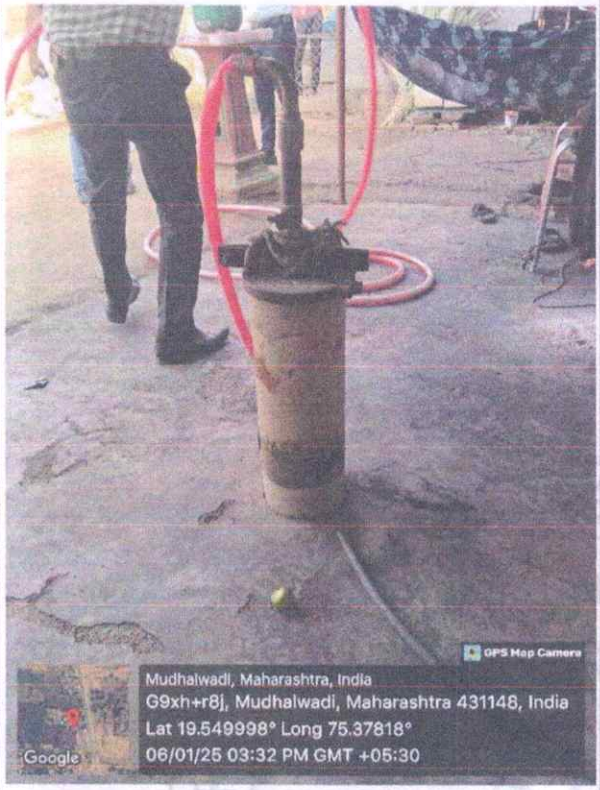

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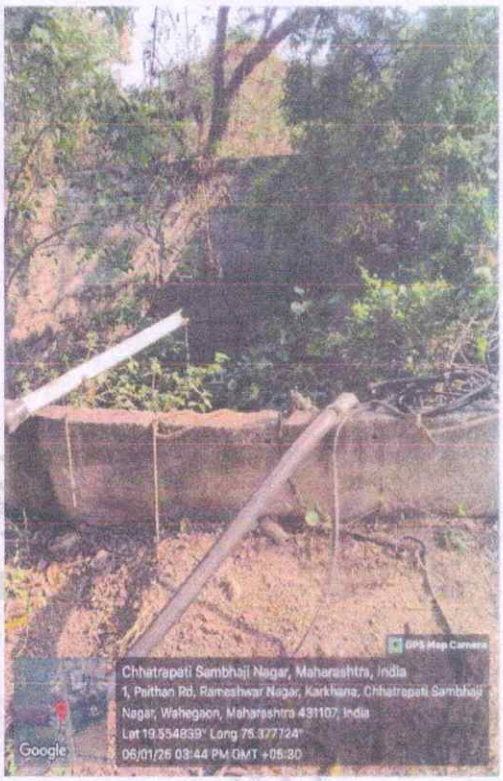
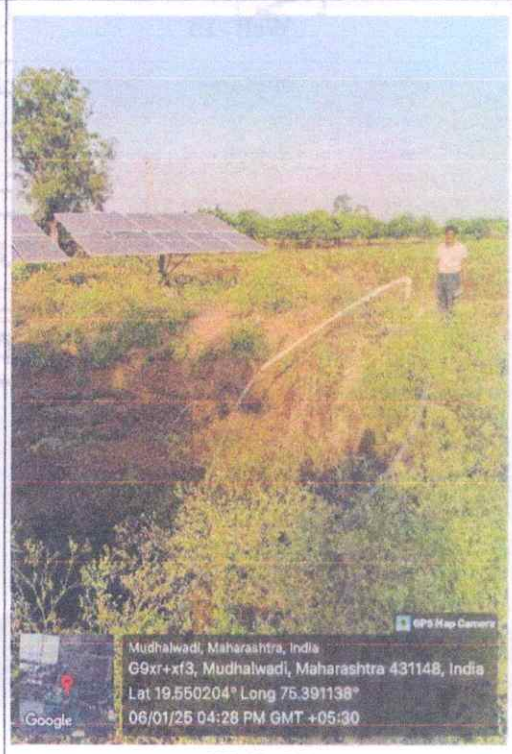


Well -18

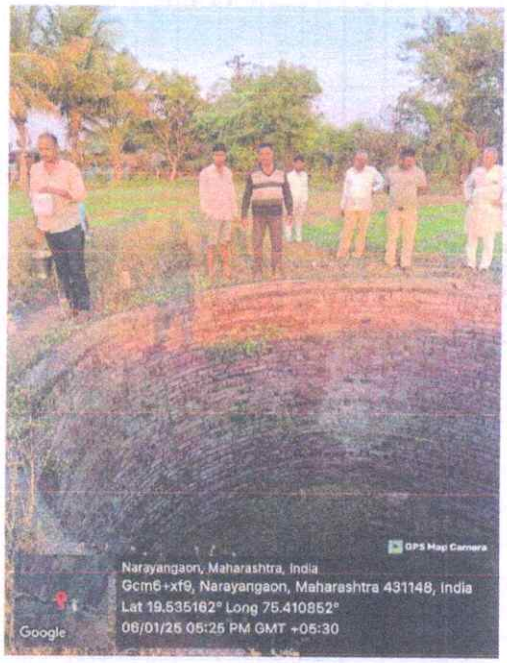
Well -19



Well -20

Well -21

Well -22



Well -23

Annexure-3

Well Water characteristics

Characteristic	Loc 1	Loc 2	Loc 3	Loc 4	Loc 5	Loc 6	Loc 7	Loc 8	Loc 9	Loc 10	Loc 11
Colour	< 5	8	< 5	< 5	5	6	<5	<5	<5	<5	<5
Electrical Conductivity	6813	4735	4364	3307	2835	1862	5107	1618	3048	2017	3306
pH at 25^{0}C	7.32	7.5	7.42	7.64	7.56	7.58	7.2	8.05	7.78	7.94	7.88
Chloride (as Cl)	2315.94	1675.37	2069.57	1231.89	739.12	492.76	1921.74	591.31	1084.06	689.86	1333.37
Cadmium (as Cd)	0.0062	0.0094	0.0051	0.0089	0.0105	0.0121	0.0117	0.0075	0.0081	0.0068	0.0056
Lead (as Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (as Ni)	0.0134	<0.01	0.0299	0.1085	<0.01	0.032	0.036	<0.01	0.0154	<0.01 0.01	<0.01
Total Dissolved Solids	4445	3085	2849	2165	1864	1235	3342	1075	1998	1338	2172
Zinc (as Zn)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic as As	0.0259	0.0149	0.0295	0.0254	0.0166	0.0186	0.0207	0.0197	0.0226	0.019	0.015
Manganese (as Mn)	0.4091	0.3153	0.2814	0.3614	0.3008	0.3113	4.8237	0.3008	0.3089	0.3105	0.3008
Total Chromium (as Cr)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Suspended Solids	7	<5	<5	<5	<5	<5	<5	<5	<5	<5	10
Oil & Grease	26	<5	19	<5	11	11	5	7	14	10	16
Sulphate as SO_4	223.53	40.49	165.69	177.45	138.24	492.76	106.86	43.53	194.12	117.65	171.57
Nitrate as NO_3	7.27	30.41	38.13	37.84	38.22	25.19	10.53	6.58	23.87	23.79	29.71
Biochemical Oxygen Demand at 27^{0}C for 3 Days	14	12	18	5	13	7	14	9	4	3	9

Ammonical Nitrogen as NH_3-N	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	5.25	<0.1	<0.1	<0.1	<0.1
Chemical oxygen Demand	52	42	62	16	46	23	49	33	13	10	33
Iron(as Fe)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper (as Cu)	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Total Phosphorus	0.34	<1	<1	<1	0.023	<1	<1	<1	<1	<1	<1
Mercury	0.0106	0.0058	0.0051	0.0051	0.0018	0.0029	0.003	0.0038	0.0021	0.0032	0.0022
Fecal Coliform	1600	1600	900	1600	1600	1600	500	900	500	350	1600
Phenolic Compounds (as C_6H_5OH)	<0.001	<0.001	<0.001	0.001	0.0011	0.0013	0.0015	0.0011	0.0013	<0.001	<0.001
Dissolved Oxygen	4.5	1.4	3.4	4.8	2.3	2.1	1.2	5	4.6	5	2.9

V. N. I. T. Civil Engg Deptt. NAGPUR.

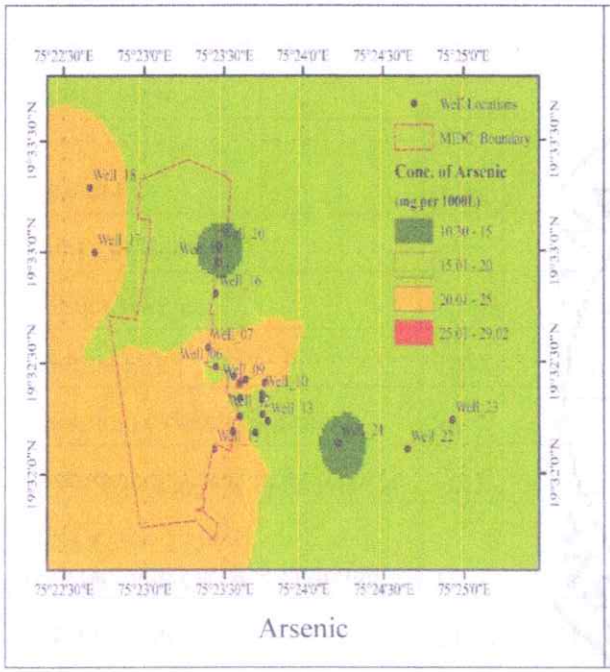
Annexure-3

Well Water characteristics

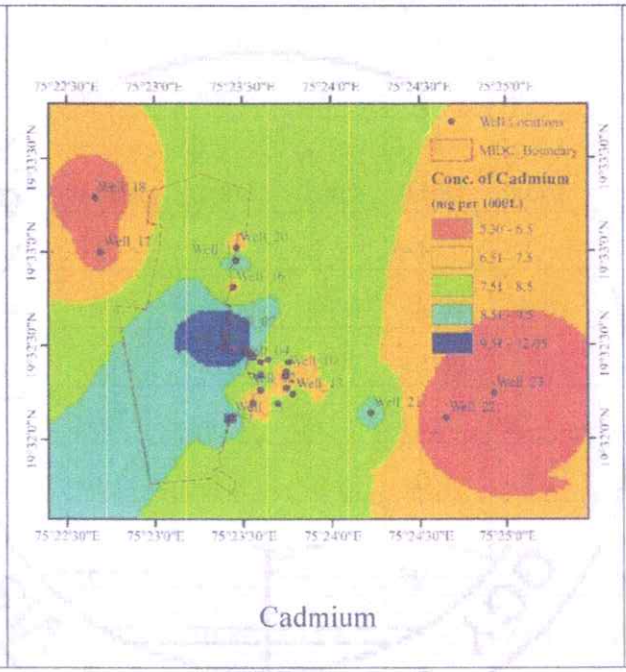
Characteristic	Loc 12	Loc 13	Loc 14	Loc 15	Loc 16	Loc 17	Loc 18	Loc 19	Loc 20	Loc 21	Loc 22	Loc 23
Colour	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Electrical Conductivity	3486	3885	4127	1205	1807	1030	575.6	2008	1877	4268	1804	924.9
pH at 25^{0}C	7.84	7.93	7.55	7.9	7.45	7.8	7.26	7.94	7.42	7.69	8.14	8.2
Chloride (as Cl)	1231.89	1281.16	1428.99	256.23	335.07	98.55	68.99	433.62	453.33	1379.71	492.76	157.68
Cadmium (as Cd)	0.0068	0.0083	0.0078	0.0099	0.0072	0.0062	0.0057	0.0096	0.0067	0.0089	0.0053	0.0055
Lead (as Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel (as Ni)	<0.01	0.04	0.051	0.0279	<0.01	0.044	0.0279	0.0982	0.0361	0.0361	0.0288	0.0312
Total Dissolved Solids	2283	2545	2698	804	1193	690	395	1334	1247	2798	1194	632
Zinc (as Zn)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic as As	0.021	0.016	0.019	0.023	0.02	0.0213	0.0209	0.0101	0.0149	0.012	0.016	0.018

Manganese (as Mn)	0.2911	0.3129	0.2968	0.2757	0.3323	0.2992	0.2935	0.9964	1.7381	0.3016	0.3416	0.3057
Total Chromium (as Cr)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Suspended Solids	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Oil & Grease	9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate as SO_4	173.53	167.65	140.2	105.88	163.73	155.88	78.14	155.88	133.33	169.61	182.35	102.94
Nitrate as NO_3	34.94	34.05	33.69	20.86	17.52	35.37	8.04	20.87	4.92	30.21	34.49	37.13
Biochemical Oxygen Demand at 27^0C for 3 Days	11	12	16	7	8	36	24	36	32	28	8	8
Ammonical Nitrogen as NH_3-N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chemical oxygen Demand	39	42	16	23	29	137	82	121	111	98	27	23
Iron(as Fe)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper (as Cu)	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Total Phosphorus	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Mercury	0.0022	0.0024	0.0019	0.0034	0.0036	0.0034	0.0013	0.0027	0.0106	0.0021	0.0024	0.0023
Fecal Coliform	280	300	900	900	300	<2	80	900	1600	500	350	280
Phenolic Compounds (as C_6H_5OH)	0.0011	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	0.0013	<0.001	0.0011	<0.001	<0.001
Dissolved Oxygen	5.2	3.4	2.1	4.3	5.3	3.2	4	5.6	5.1	3.9	5.7	7.4

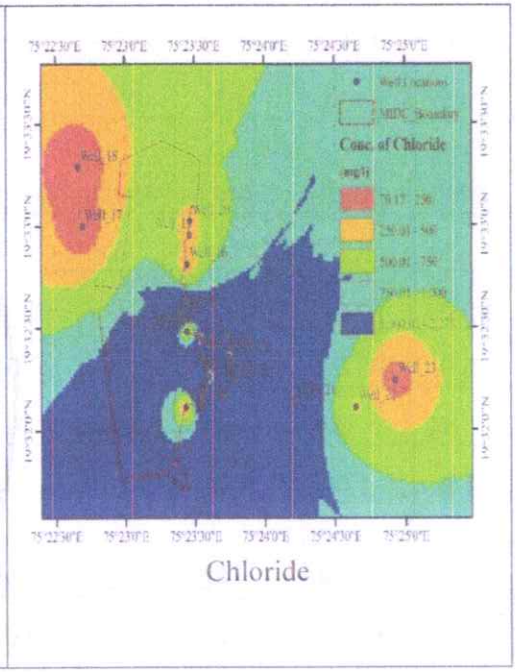
Spatial mapping of pollutants



Arsenic



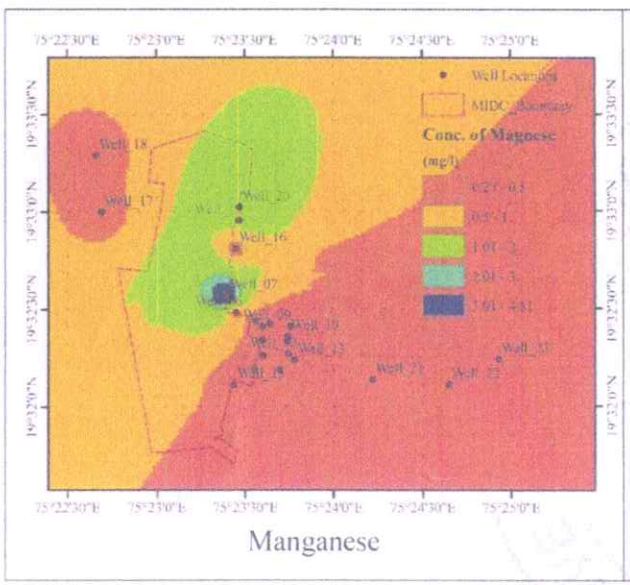
Cadmium



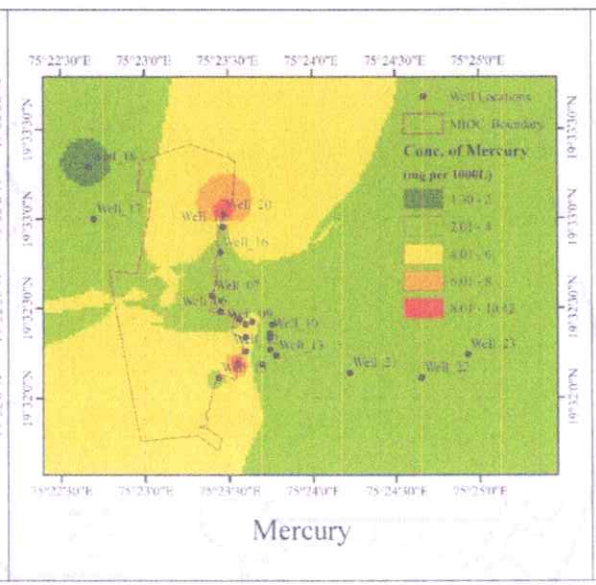
Chloride

Annexure-4

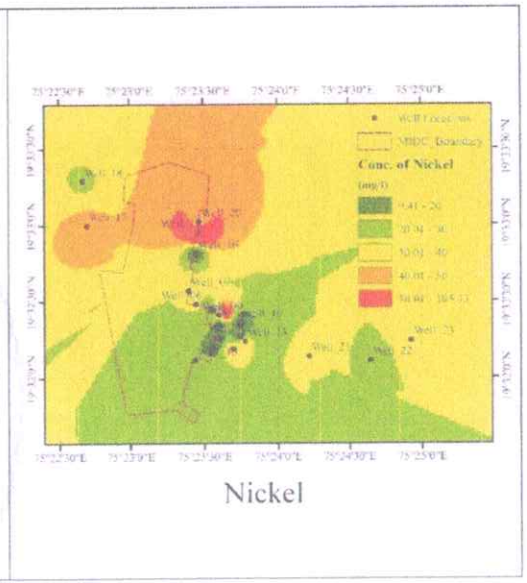
Spatial mapping of pollutants



Manganese



Mercury



Nickel

Annex-III

Outlook

Fwd: Final report of MIDC Paithan as per orders issued in Hon'ble NGT in the matter OA No. 222 of 2023 Mrs. Mangal Bodkhe Vs Matrix Life Science Pvt Ltd.

From SRO Chhatrapati Sambhaji Nagar <srochhatrapatisambhajinagar1@mpcb.gov.in>
Date Fri 06-06-2025 14:38
To Agriculture officer Aurangabad <dsaoabad@gmail.com>; stlabad2@gmail.com <stlabad2@gmail.com>
Cc Ravindra Andhale <jdair@mpcb.gov.in>; jdwpc@mpcb.gov.in <jdwpc@mpcb.gov.in>; JD Water <jdwater@mpcb.gov.in>; RO Chhatrapati Sambhaji Nagar <rochhatrapatisambhajinagar@mpcb.gov.in>; Smita Madhav Khatavkar <lo1@mpcb.gov.in>

1 attachment (14 MB)
MIDC Paithan report signed.pdf;

Sir / Madam,

As per telephonic instructions from law officer received today, Please find attachment herewith report submitted by VNIT about ground water contamination in MIDC Paithan area as per orders issued in Hon'ble NGT in the matter OA No. 222 of 2023 Mrs. Mangal Bodkhe Vs Matrix Life Science Pvt Ltd. Please refer your letter dated june 19,2024.

In the said matter, NGT have constituted a Committee, comprising one Member from each of: (i) The District Collector, Aurangabad; (ii) The District Agricultural Officer, Aurangabad; and (iii) The Central Pollution Control Board (CPCB). which will assess the damage caused to the agricultural crops/lands of the applicants. Further, Honorable District Collector constitited a committee for assessment of the damage caused to the agricultural crops/lands of the applicants where in District superintendent of agriculture Officer was appointed as a model agency.

The nodal agency district superintendent of agriculture vide letter dated 19/06/2024 communicated MPCB that the committee constituted as per orders by NGT visited the site in question on 14 June 2024 and decided line of action as below

a) MPCB shall draw random samples of 25 in the affected area and submit its analysis report to committee on priority

b) soil conservation department shall collect random sampling of affected soil area at 10 points and submit its analysis report to Nodal agency.

Meantime, MPCB have appointed VNIT for assessment of groundwater contamination by collection of water samples from dug wells in affected areas. VNIT Nagpur vide email dated 23/04/2025 have submitted draft report about project for assessment of groundwater contamination and mitigation plan.

Therefore, it is requested to Nodal agency District Superintendent Agriculture officer for preparation of comprehensive report about assessment of the damage caused to the agricultural crops/lands of the applicants as per order issued by Hon'ble NGT dated 22/04/2024. The said report needs to be submitted to Hon'ble tribunal.

The next date of hearing of said matter is scheduled on 18th June 2025.

This is submitted for your information & further needful in these regards....

(A. S. Nandvate)
Sub Regional Officer
Chhatrapati Sambhaji Nagar
---------- Forwarded message ----------
From: "Dr. Karthik Balasundaram" <karthik@civ.vnit.ac.in>
Date: 25-Apr-2025 16:46
Subject: Final report of MIDC Paithan.
To: Ravindra Andhale <jdair@mpcb.gov.in>
Cc: SRO Chhatrapati Sambhaji Nagar <srochhatrapatisambhajinagar1@mpcb.gov.in>,"Dr. A.B Mirajkar" <abmirajkar@civ.vnit.ac.in>,"DR. DILIP H. LATAYE" <dhlataye@civ.vnit.ac.in>,RO Chhatrapati Sambhaji Nagar <rochhatrapatisambhajinagar@mpcb.gov.in>

Dear Sir,
With respect to the work order issued through letter no BO/JD(APC)/TB/B-0037 dt. 1st July 2024, please find attached the signed report of **"Assessment of Ground Water Contamination and mitigation plan based on detailed assessment of contaminated ground water at Paithan MIDC area, Chhatrapati Sambhajinagar".**

5 copies of the report are sent to your office by post. Kindly acknowledge the same.

--
Best Regards,

KARTHIK BALASUNDARAM (Ph.D.),
ASSISTANT PROFESSOR
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VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY,
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