Monitoring, Sampling and Analysis for Ambient Air Quality, Surface Water Quality and Ground Water Quality in Critically/Severely/Other Polluted Areas

AURANGABAD

Pre-Monsoon (April 2024 to June 2024)

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Index

ABBREVIATIONS

APHA	American Public Health Association
ASTM	American Society for Testing and Materials
BIS	Bureau of Indian Standards
BLQ	Below the Limit of Quantification
CAAQMS	Continuous Ambient Air Quality Monitoring Station
CEMS	Continuous Emission Monitoring System
CEPI	Comprehensive Environmental Pollution Index
CETP	Common Effluent Treatment Plant
CPA	Critically Polluted Area
CPCB	Central Pollution Control Board
EPA	Environmental Protection Act, 1986
GDP	Gross Domestic Product
MIDC	Maharashtra Industrial Development Corporation
MPCB	Maharashtra Pollution Control Board
NAAQS	National Ambient Air Quality Standard
NWMP	National Water Quality Monitoring Program
SPA	Severely Polluted Area
VOCs	Volatile Organic Compounds
WHO	World Health Organisation
ZLD	Zero Liquid Discharge

1. Executive Summary

Aurangabad CEPI area includes four Maharashtra Industrial development Corporations (MIDCs) namely, MIDC Shendra, MIDC Chikalthana, MIDC Waluj and MIDC Paithan were monitored for Ambient Air Quality, Ground and Surface Water quality. Based on the data collected by monitoring, a Comprehensive Environmental Pollution Index (CEPI) Score [as per latest directions 120 of Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016 of Central Pollution Control Board (CPCB)] was calculated. Maharashtra Pollution Control Board (MPCB) has carried out monitoring at CPCB locations with the additional locations of sampling for ambient air, surface and ground water in consideration with the previous CEPI monitoring and covering the entire CEPI Impact Zone. The pre-monsoon monitoring was carried out during the period of April 2024 to June 2024 to assess the ambient air quality, surface water quality and ground water quality.

The Ambient Air Quality stations were identified considering the upwind and cross wind direction in the CEPI impact area. Ambient Air Quality was monitored at sixteen locations. The concentration of all ambient air parameters was found well within the limits prescribed by NAAQS. Twenty-three locations for surface water and twelve for ground water were monitored for the study. Concentration values of BOD, Total Phosphate (TP) and Total Kjeldahl Nitrogen (TKN) were found above the standard limits in few of the surface water samples. Land index is represented by groundwater in the CEPI. Most of the groundwater parameters were found to be within the permissible limits when compared with IS 10500:2012 drinking water standards.

Based on the study conducted by CPCB during the period January 2018, the CEPI score of Aurangabad region as per the revised guidelines of CEPI (2016) was 69.85 (Air Index–45, Water Index-65.38 and Land Index–28.75). However, the present study reports aggregated CEPI score of Aurangabad region of pre-monsoon season (June 2024). Based on the study, the present CEPI score is 59.3 (Air Index–20.5, Water Index-56.0 and Land Index–37.1). The CEPI score is the combination of A, B, C and D factors. Here, C factor represents the health data and D factor represents the initiatives taken by MPCB in the past few years to mitigate the pollution. The regional office of MPCB has taken various initiatives like installation of CAAQMS, CETPs, online VOC analysers etc. in the past few years to control and mitigate the air and water pollutants. This has contributed to the factor D, hence reducing the CEPI score of the region over the years.

The analysis of the aggregated CEPI score shows that the pollution in Aurangabad industrial clusters has reduced in the last three years. Approximately 15% decrease in CEPI score is observed from 69.85 in 2018 to 59.3 in 2024.

2. Introduction

The industrial sector remains a pivotal force in driving a nation's economic growth, significantly contributing to increased production, fixed investment, exports, employment, and capacity utilization. Industries serve as engines of economic development, bolstering government revenue, international trade, social services, and job creation. The growth rate of the industrial sector directly impacts the overall economic growth of a country. Consequently, industries are essential for achieving economic goals and prosperity. According to the World GDP Ranking 2024, India stands as the fifth-largest economy globally. Several Sustainable Development Goals (SDGs) focus on growth, including Decent Work and Economic Growth (Goal 8) and Industry, Innovation, and Infrastructure (Goal 9).

Despite these economic benefits, industrial activities have a profound negative impact on the environment, affecting water, air, and soil quality. Industries discharging untreated wastewater have contaminated drinking water with hazardous substances, posing severe risks to human, animal, and aquatic life. Air pollution from industrial emissions is linked to a range of respiratory and cardiovascular diseases, particularly affecting children and leading to increased rates of infant mortality and chronic health issues in adulthood. According to the World Health Organization (WHO), environmental pollution is responsible for approximately 9 million premature deaths annually. Over 90% of the global population is exposed to air pollution levels exceeding WHO guidelines, posing serious health risks. Furthermore, around 2 billion people use drinking water contaminated with faeces, leading to infectious diseases such as cholera and dysentery.

The impact on flora and fauna is equally alarming. Industrial pollution has led to habitat destruction, loss of biodiversity, and the disruption of ecosystems. Toxic pollutants can cause genetic mutations, reproductive failures, and behavioral changes in wildlife, endangering entire species. Plants exposed to polluted air and water can experience stunted growth, reduced photosynthesis, and increased susceptibility to diseases, which ultimately affects food security and ecosystem stability.

To mitigate these adverse effects, robust environmental policies are essential. These policies set forth rules for industries and individuals, enforced by government agencies. Key aspects include monitoring pollution levels, imposing fines or penalties on violators, and conducting environmental impact assessments for proposed projects. Conservation measures are crucial for protecting biodiversity, and policies must be regularly updated to address emerging challenges. A comprehensive approach, including robust regulatory frameworks, international collaboration, advanced monitoring technologies, and a commitment to sustainable practices from industries and governments, is vital for safeguarding our natural resources and promoting sustainability.

Simultaneously, the Comprehensive Environmental Pollution Index (CEPI) has emerged as a beacon of assessment and action in India's environmental landscape. Introduced as a standardized methodology for evaluating and addressing pollution in industrial clusters across the nation, the CEPI represents a significant step towards achieving the delicate balance between economic growth and environmental sustainability. Developed through collaborative efforts between environmental

scientists, regulatory authorities, and community stakeholders, the CEPI serves as a vital instrument for identifying, prioritizing, and mitigating pollution in industrial areas. By systematically monitoring, sampling, and analyzing pollution parameters such as ambient air quality, surface water quality, and groundwater quality, the CEPI empowers policymakers and regulators to make informed decisions and allocate resources effectively.

In Maharashtra, where industrial activities drive economic growth and employment opportunities, the importance of the CEPI cannot be overstated. Through strategic monitoring, sampling, and analysis efforts, the CEPI aims to provide a comprehensive assessment of pollution levels and their impacts on environmental health in critically, severely, and other polluted industrial areas across the state.

Moreover, the application of the CEPI extends beyond mere assessment, serving as a catalyst for targeted interventions and regulatory enforcement in polluted industrial areas. By identifying pollution hotspots and vulnerable communities, the CEPI enables authorities to implement remedial measures, enforce pollution control norms, and monitor progress towards environmental sustainability.

In the following sections, we delve into the methodology, findings, and implications of both the CEPI assessment and the Monitoring, Sampling, and Analysis for Ambient Air Quality, Surface Water Quality, and Groundwater Quality in Polluted Industrial Areas of Chembur in Mumbai, Maharashtra. The present CEPI study includes Aurangabad region, which is a place of great importance due to its location on the famous Silk Route that traversed across the breadth of Asia to reach Europe. Aurangabad city typifies the landscape and the climatic conditions of the entire Marathwada region and is the Divisional Head Quarters of the Marathwada Region. The city is situated on the bank of river Kham a tributary of the Godavari River. s situated on the bank of river Kham a tributary of the Godavari River. The city is surrounded by hills of the Vindhya Ranges and the river Kham passes through it.

Aurangabad accounts for 4 MIDCs about with 1045 red category industries, 596 orange category industries and 3058 green category industries of various category engaged in the manufacturing of chemicals, dyes, dye-intermediates, Bulk drugs, pharmaceuticals, Textile auxiliaries, Pesticides, Petrochemicals, Iron and steel, Textile processors, Engineering units etc. Besides the industries, there are other sources which are major contributors of pollution like emissions by transport and construction activities etc.

The present report is also based on the revised CEPI version 2016. The index captures the various dimensions of environment including air, water and land. Comprehensive Environmental Pollution Index (CEPI), which is a rational number to characterize the environmental quality at a given location following the algorithm of source, pathway and receptor have been developed. The CEPI reports serve as a roadmap for targeted interventions, regulatory enforcement, and community engagement aimed at mitigating pollution and safeguarding public health in the area. Despite the persistent challenges, ongoing initiatives guided by the CEPI action plan reports offer hope for addressing environmental concerns and fostering sustainable development in Aurangabad.

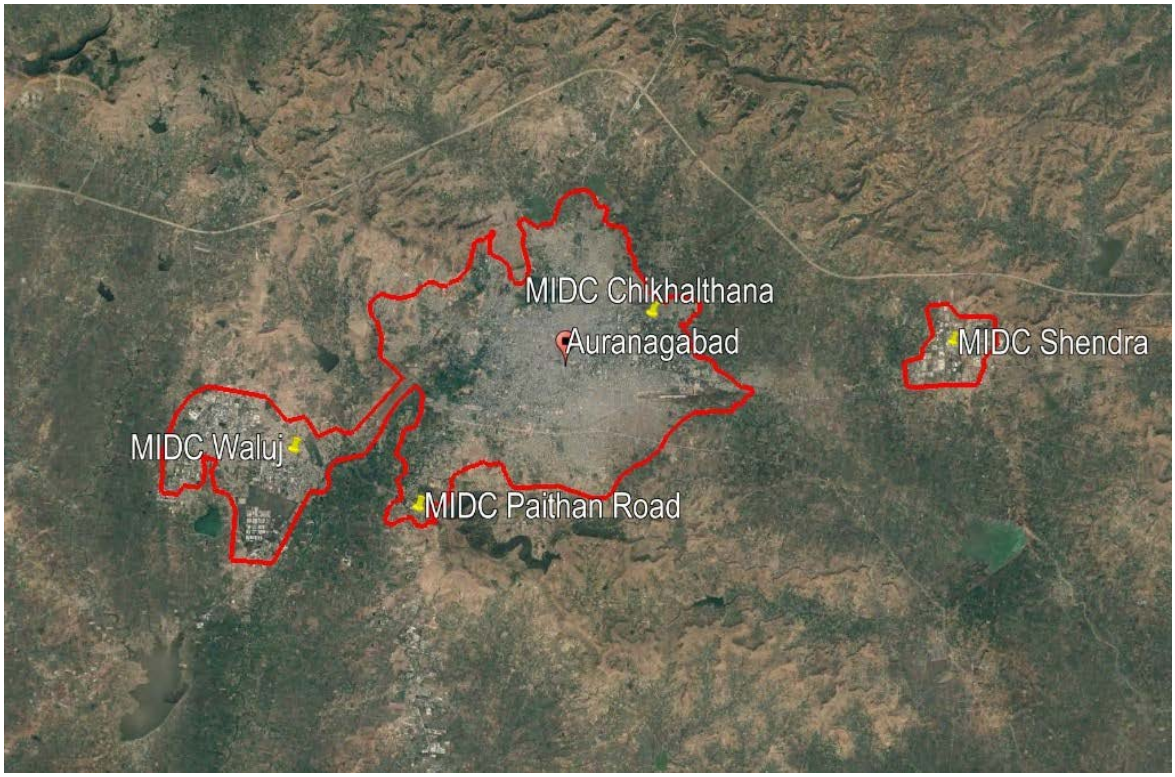


Fig: Aurangabad region CEPI monitoring zone

3. Scope of Work

The major scope of work includes:

I. The scope of the present study is to perform three (3) rounds of "Monitoring, Sampling and Analysis for Ambient Air Quality, VOCs in Ambient Air, Surface Water Quality & Ground Water Quality in the selected Pollution Industrial Areas (PIAs) of Aurangabad, Maharashtra" with a gap of one or two days. The analysis of the collected samples was carried out by the standard methods (CPCB, BIS, APHA, USEPA).

II. To Collect health-related data in the CEPI region.

III. To calculate the Comprehensive Environmental Pollution Index (CEPI) Score as per Revised CEPI-2016 issued by Central Pollution Control Board (CPCB).

The sampling details and frequency of sampling in Ambient Air, VOCs, Surface Water and Ground Water are given in Table 3.1 and Table 3.2 respectively.

Table 3.1 Sampling Details of Aurangabad

Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Ambient Air Quality	MIDC Shendra-04 MIDC Chikalthana -04 MIDC Waluj - 04 MIDC Paithan Road - 04	**16**	PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3, O_3, C_6H_6, CO, BAP, Pb, Ni, As
Volatile Organic Compounds (VOCs)	MIDC Shendra-02 MIDC Chikalthana -02 MIDC Waluj - 02 MIDC Paithan Road - 02	**08**	Dichloromethane,Chloroform,CarbonTetrachloride ,Trichloroethylene, Bromodichloromethane, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,3-Dichlorobenzene, 1,2-Dichlorobenzene, 1,2-Dibromo-3-Chloropropane, Naphthalene, Bromobenzene,1,2,4-Trimethylbenzene,2-Chlorotoluene, Tert-Butylbenzene, SEC-Butylbenzene, P-Isopropyltoluene, M-Xylene, P-Xylene, Styrene, Cumene 1,2,3-Trichloropropane,N-Propylbenzene, Dibromochloromethane, 1,2-Dibromoethane, Chlorobenzene, 1,1,1,2-Tetrachloroethane, Ethylbenzene, 1,1-Dichloropropylene, 1,2-Dichloroethane, 1,2-Dichloropropane, Trans-1,3-Dichloropropene, CIS 1,3-Dichloropropene, 1,1,2-Trichloroethane, Tetrachloroethylene, 1,3,5-Trimethylbenzene, N-Butylbenzene,1,2,3-

Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
			Trichlorobenzene, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, 2,2-Dichloropropane, Dibromomethane, Toluene, O-Xylene, Bromoform, 1,1,2,2-Tetrachloroethane, 4-Chlorotoluene, 1,1-Dichloroethylene, Trans-1,2-Dichloroethylene, 1,1-Dichloroethane, CIS-1,2-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality Monitoring	**Surface water** MIDC Shendra-06 MIDC Chikalthana -06 MIDC Waluj - 06 MIDC Paithan Road - 06	**24**	**(i) Simple Parameters** Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological **(ii) Regular Monitoring Parameters** pH, O & G, Suspended Solids, DO, COD, BOD, TDS, Electrical Conductivity, Total Dissolved Solids, Nitrite–Nitrogen, Nitrate-Nitrogen, (NO_2+NO_3) total nitrogen, Free Ammonia, Total Residual Chlorine, Cyanide, Fluoride, Chloride, Sulphate, Sulphides, Total Hardness, Dissolved Phosphates, SAR, Total Coliforms, Faecal Coliform **(iii) Special Parameters** Total Phosphorous, TKN, Total Ammonia (NH_4+NH_3)-Nitrogen, Phenols, Surface Active Agents, Anionic detergents, Organo-Chlorine Pesticides, PAH, PCB, Zinc, Nickel, Copper, Hexa-valent Chromium, Chromium (Total), Arsenic (Total), Lead, Cadmium, Mercury, Manganese, Iron, Vanadium, Selenium, Boron **(iv) Bio-assay (zebra Fish)** Test – For specified samples only.
	Ground water MIDC Shendra-03 MIDC Chikalthana -03 MIDC Waluj - 03 MIDC Paithan Road - 03	**12**	

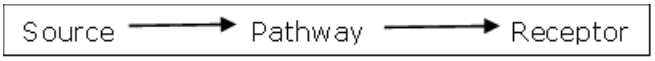
Table 3.2 Frequency of Sampling

	Parameter	Round of Sampling	Frequency in Each Round
A	**Ambient Air Quality Monitoring**		

	Parameter	Round of Sampling	Frequency in Each Round
1.	Particulate Matter (size less than 10 µm) or PM_{10}	03	3 Shifts of 8 hrs each
2.	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	03	1 Shift of 24 hrs
3.	Sulphur Dioxide (SO_2)	03	6 Shifts of 4 hrs each
4.	Nitrogen Dioxide (NO_2)	03	6 Shifts of 4 hrs each
5.	Ammonia (NH_3)	03	6 Shifts of 4 hrs each
6.	Ozone (O_3)	03	24 Shifts of 1 hr each
7.	Benzene (C_6H_6)	03	1 Shifts of 24 hrs
8.	Carbon Monoxide (CO)	03	24 Shifts of 1 hr each
9.	Benzo (a) Pyrene (BaP) – particulate phase only	03	3 Shifts of 8 hrs each
10.	Lead (Pb)	03	3 Shifts of 8 hrs each
11.	Arsenic (As)	03	3 Shifts of 8 hrs each
12.	Nickel (Ni)	03	3 Shifts of 8 hrs each
B	**Volatile Organic Compounds (VOCs)**		
	As mentioned in Table 3.1	03	3 Shifts of 24 hrs each
C	**Ground Water**		
	As mentioned in Table 3.1	03	01 sample at each round
D	**Surface Water**		
	As mentioned in Table 3.1	03	01 sample at each round

4. Methodology

The present report is based on the revised Comprehensive Environmental Pollution Index (CEPI) version 2016. The index captures the various dimensions of the environment including air, water and land. Comprehensive Environmental Pollution Index (CEPI) is a rational number, which is used to characterize the environmental quality at a given location. It is three-step process based on the algorithm of Source, pathway and Receptor.



Ambient air stations, Surface water locations and Ground water locations were decided by the respective regional officers. The sampling was done in 3 rounds with an interval of one or two days at each location. Sampling has been done at the potential polluted areas so as to arrive at the CEPI. This will further help the authorities to monitor the areas in order to improve the current status of their environmental components such as air and water quality data, ecological damage and visual environmental conditions.

Methodology for sampling, preservation and analysis have been done according to the CPCB/ EPA/ APHA/ IS/ ASTM standard methods for the samples.

AIR ENVIRONMENT

5. Air Environment

For studying the Air Environment of Aurangabad area, monitoring stations were identified considering the upwind and cross wind direction and all 12 parameters as per the notification of National Ambient Air Quality Standards (NAAQS) were carried out.

**Kindly note: Volatile Organic Compounds (VOCs) concentration is not detected in most of the Air samples collected; hence it is not shown in the graphs here.*

1. **MIDC Shendra:** In MIDC Shendra, four locations have been monitored to check the Ambient Air Quality (AAQ) in triplicate from 26th June 2024 to 30th June 2024. All the 12 AAQ parameters were monitored as per National Ambient Air Quality Standards (NAAQS, 2009). Results of analysis show that the concentration of most the parameters at all studied locations is observed well within the limits. VOCs were monitored at 2 locations namely Radico NV Distillery and Glenmark Pharmaceuticals Ltd.

Table 5.1 MIDC Shendra - Details of Sampling Location of Ambient Air Quality Monitoring

S.No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Skoda Auto	19.872399 N	75.489716E	26.06.2024	28.06.2024	30.06.2024
2.	Outside of Radico NV Distillery	19.883445 N	75.50208E	26.06.2024	28.06.2024	30.06.2024
3.	Outside of Glenmark Pharmaceuticals Ltd.	19.872569 N	75.502669E	26.06.2024	28.06.2024	30.06.2024
4.	Outside of Wockhardt Biotech Ltd.	19.873337 N	75.491827E	26.06.2024	28.06.2024	30.06.2024

Table 5.2 MIDC Shendra - Details of Sampling Location of VOCs Monitoring

S.No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Outside of Radico NV Distillery	19.883445 N	75.50208E	26.06.2024	28.06.2024	30.06.2024
2.	Outside of Glenmark Pharmaceuticals Ltd.	19.872569 N	75.502669E	26.06.2024	28.06.2024	30.06.2024

Fig: Geographical Locations of Ambient Air Quality Monitoring MIDC Shendra

Fig: Geographical Locations of VOCs Monitoring MIDC Shendra

Table 5.3 MIDC Shendra - Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Skoda Auto	Outside of Radico NV Distillery	Outside of Glenmark Pharmaceuticals Ltd.	Outside of Wockhardt Biotech Ltd.
Sulphur Dioxide (SO_2)	µg/m³	33.70	7.97	25.40	15.10
Nitrogen Dioxide (NO_2)	µg/m³	9.56	BLQ	6.56	BLQ
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	53	48	57	46
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	15	13	16	13
Ozone (O_3)	µg/m³	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m³	0.12	0.14	0.15	0.12
Carbon Monoxide (1 h)	mg/m³	1.18	1.36	1.34	1.58
Carbon Monoxide (8 h)	mg/m³	1.46	1.60	1.60	1.89
Ammonia (NH_3)	µg/m³	43.55	34.25	46.40	58.60
Benzene (C_6H_6)	µg/m³	1.44	2.29	1.93	1.74
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	0.61	0.45	0.64	0.68
Nickel (Ni)	ng/m³	8.89	5.80	5.30	5.53

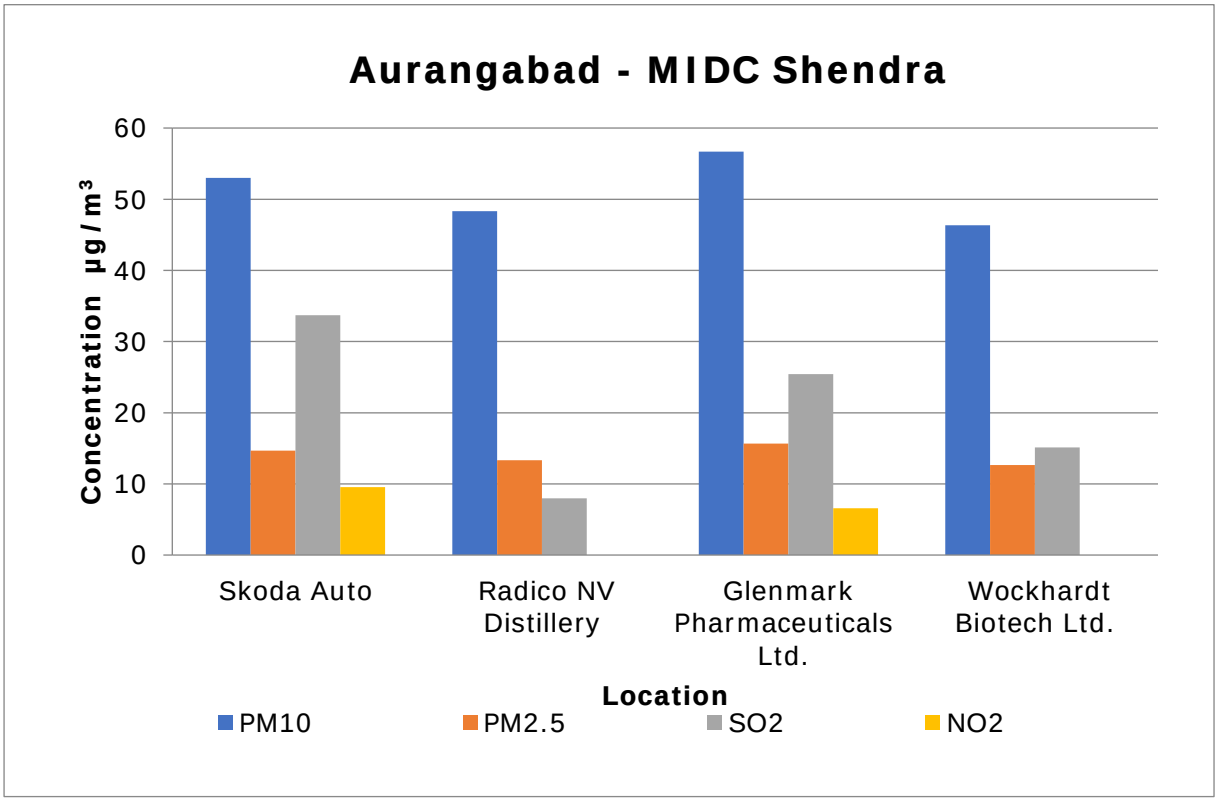
Table 5.4 MIDC Shendra - Volatile Organic Compounds (VOCs) in Ambient Air Results

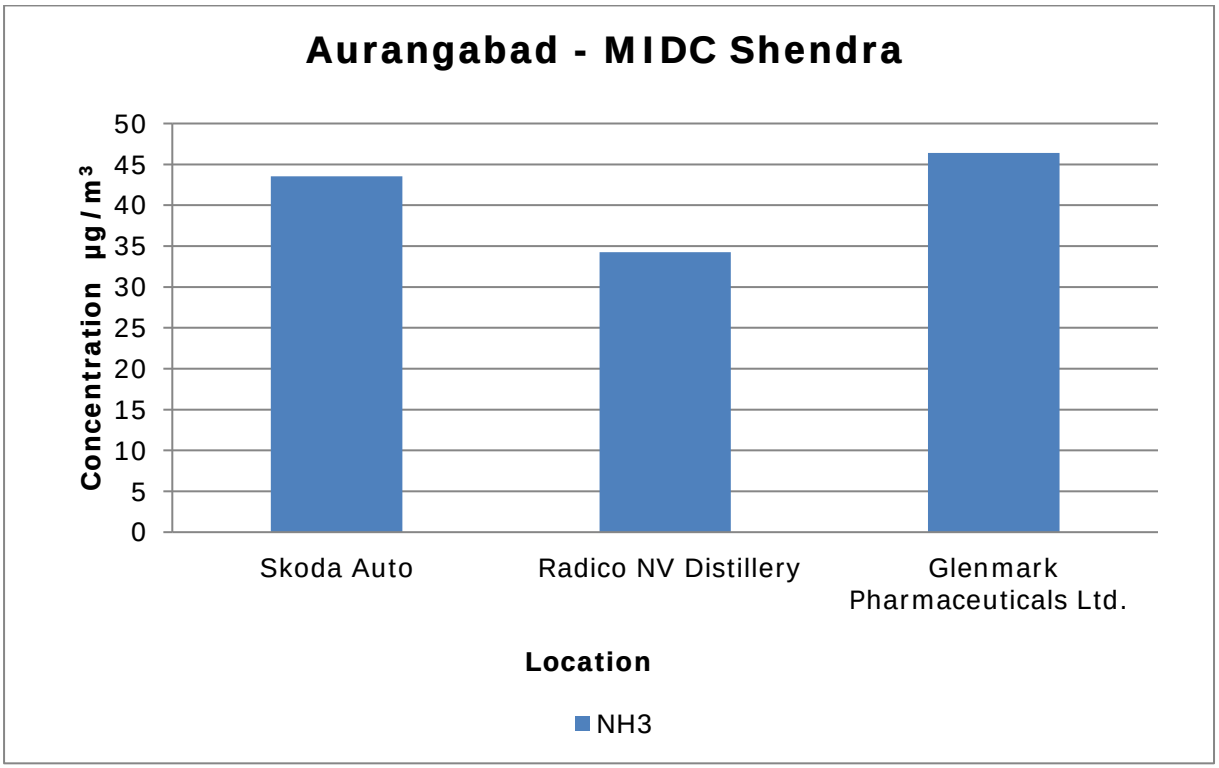
Parameters	Unit	Results	
		Outside of Radico NV Distillery	Outside of Glenmark Pharmaceuticals Ltd.
Dichloromethane	µg/m³	1.12	3.50
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ

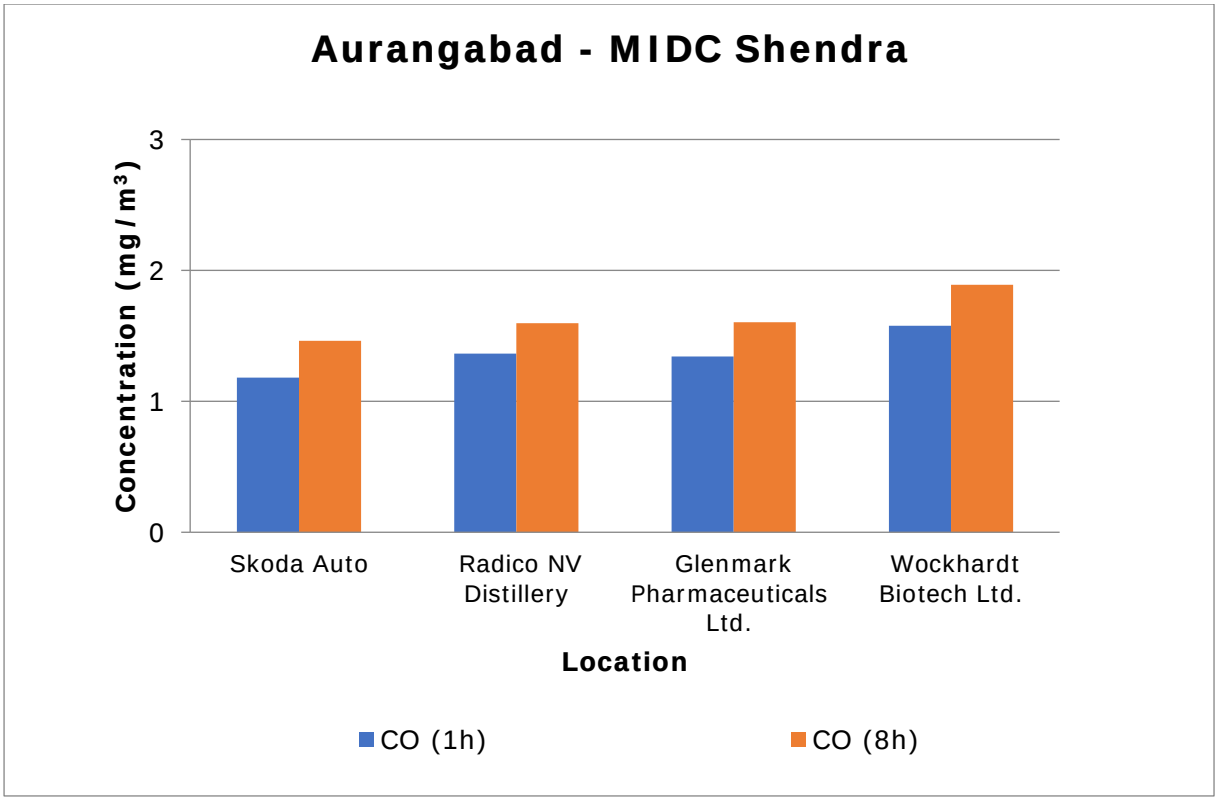
Parameters	Unit	Results	
		Outside of Radico NV Distillery	Outside of Glenmark Pharmaceuticals Ltd.
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	0.6	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	BLQ
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	1.50	1.80
O-Xylene	µg/m³	BLQ	BLQ

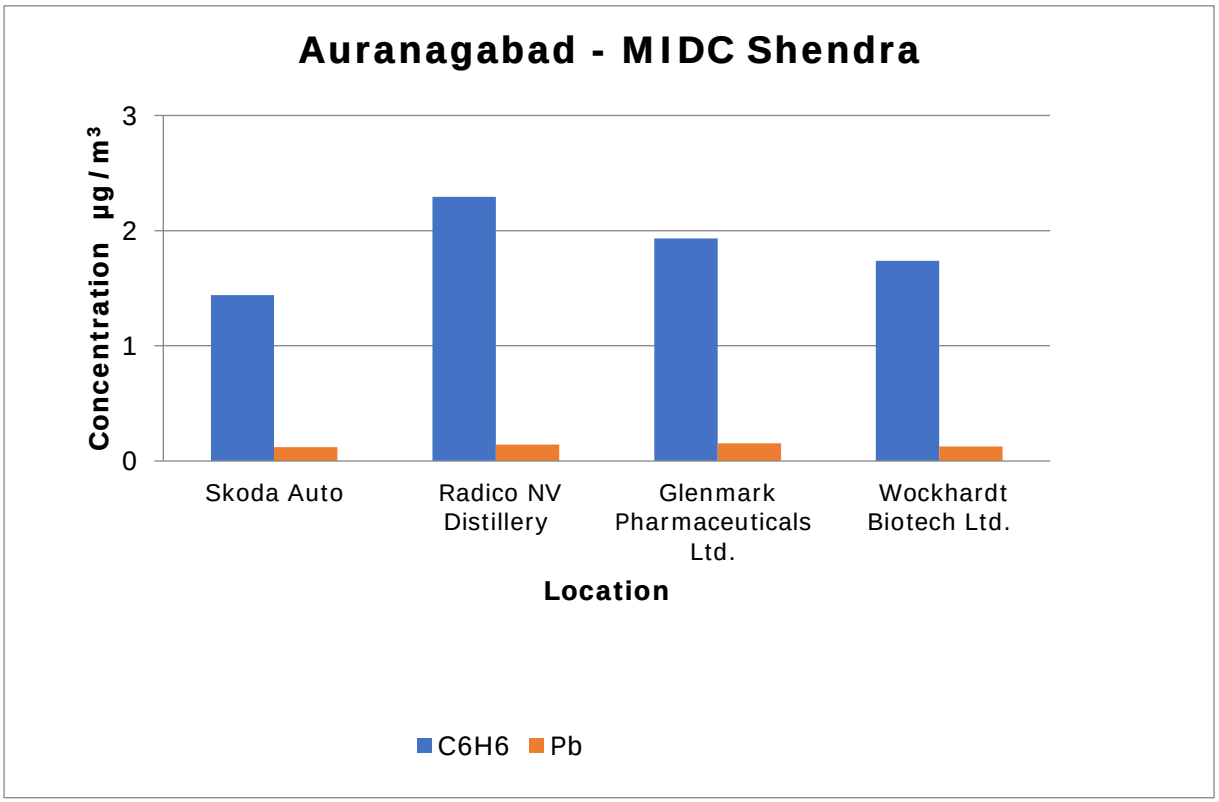
Parameters	Unit	Results	
		Outside of Radico NV Distillery	Outside of Glenmark Pharmaceuticals Ltd.
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

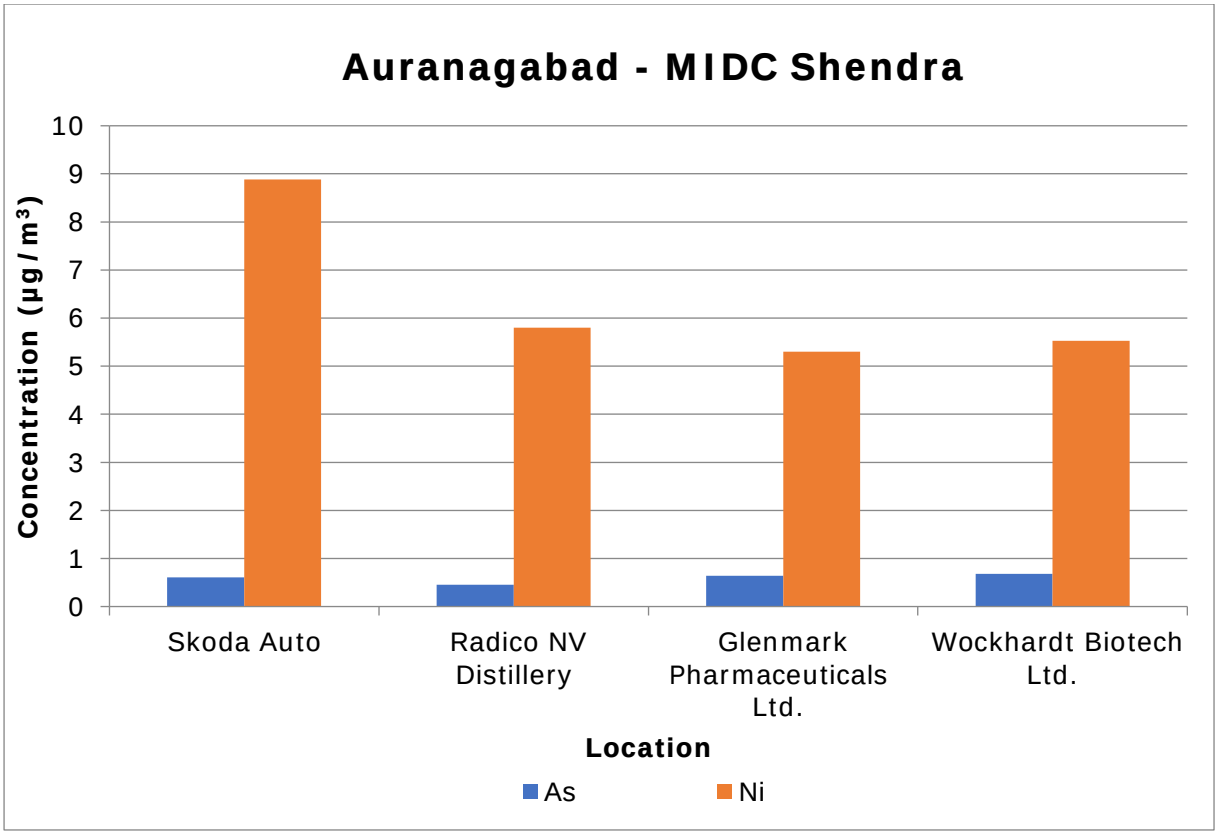
Graphs - Ambient Air Quality Monitoring - MIDC Shendra






Aurangabad - MIDC Shendra
Concentration (mg/m³)
3
2
1
0
Skoda Auto
Radico NV Distillery
Glenmark Pharmaceuticals Ltd.
Wockhardt Biotech Ltd.
Location
CO (1h)
CO (8h)


Auranagabad - MIDC Shendra
Concentration µg/m³
3
2
1
0
Skoda Auto
Radico NV Distillery
Glenmark Pharmaceuticals Ltd.
Wockhardt Biotech Ltd.
Location
C6H6
Pb


Auranagabad - MIDC Shendra
Concentration (µg/m³)
10
9
8
7
6
5
4
3
2
1
0
Skoda Auto
Radico NV Distillery
Glenmark Pharmaceuticals Ltd.
Wockhardt Biotech Ltd.
Location
As
Ni

2. MIDC Chikalthana: In MIDC Chikalthana, 4 locations were monitored from 26th June to 30th June 2024 to check the Ambient Air Quality (AAQ) as per the NAAQS, 2009. Concentration of all the parameters at all studied locations is observed well within the limits.

Table 5.5 MIDC Chikalthana - Details of Sampling Location of Ambient Air Quality Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Wockhardt Biotech Ltd. (R&D)	19.87897N	75.375939E	26.06.2024	28.06.2024	30.06.2024
2.	Harman Finochem Ltd.	19.878049N	75.383274E	26.06.2024	28.06.2024	30.06.2024
3.	ABD Distillery	19.87303N	75.388615E	26.06.2024	28.06.2024	30.06.2024
4.	Jolly Board Ltd.	19.895644N	75.378374E	26.06.2024	28.06.2024	30.06.2024

Table 5.6 MIDC Chikalthana - Details of Sampling Location of VOCs Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
5.	Concept Pharma	19.875211N	75.376632E	26.06.2024	28.06.2024	30.06.2024
6.	ABD Distillery	19.87303N	75.388615E	26.06.2024	28.06.2024	30.06.2024

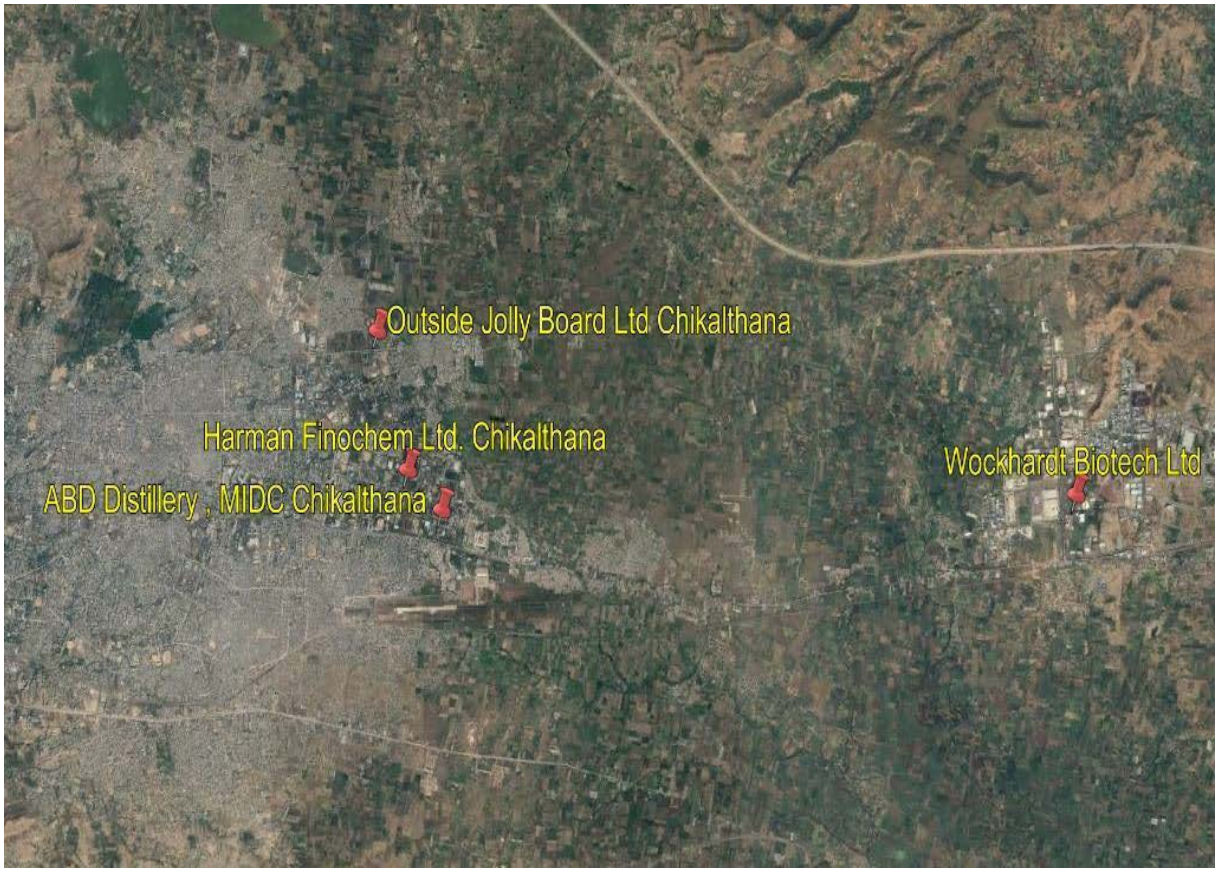


Fig: Geographical Locations of Ambient Air Quality Monitoring MIDC Chikalthana

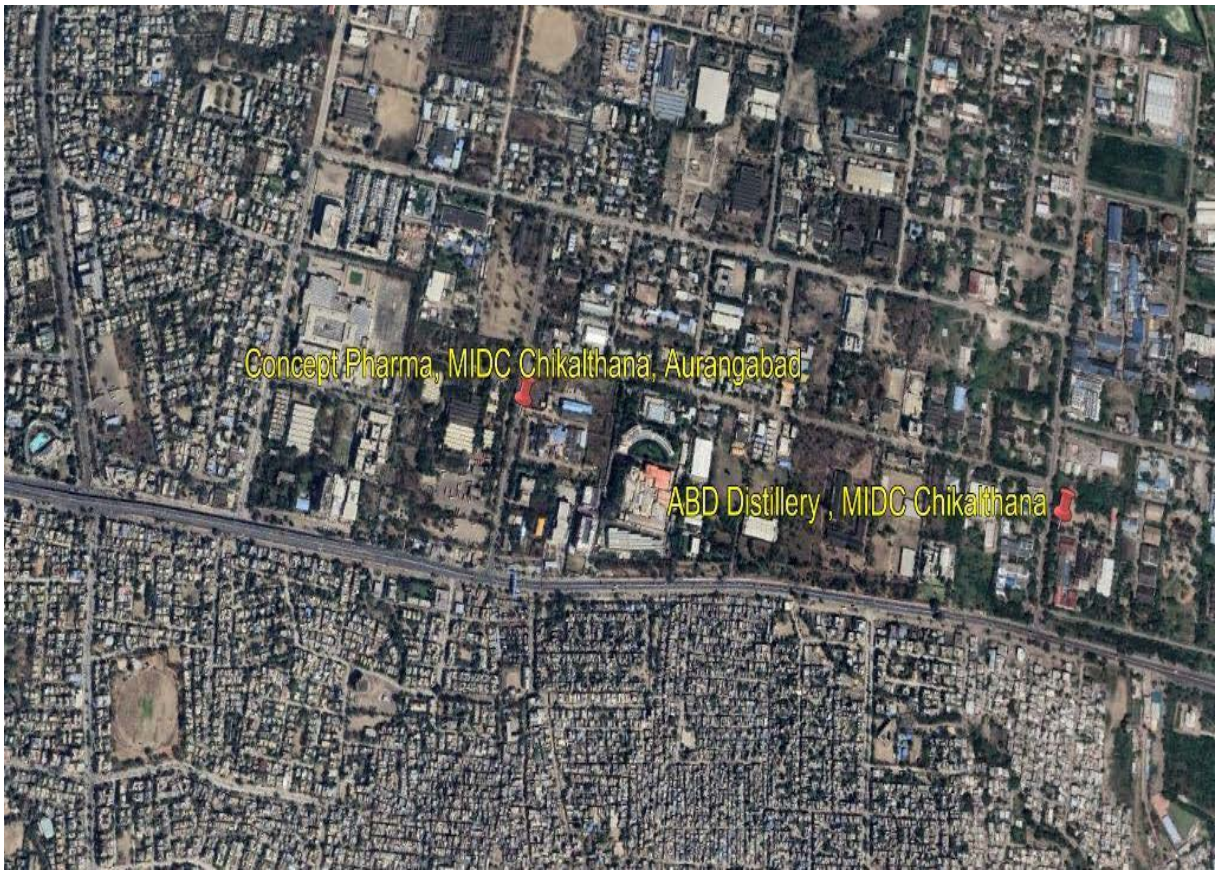


Fig: Geographical Locations of VOCs Monitoring MIDC Chikalthana

Table 5.7 MIDC Chikalthana - Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Wockhardt Biotech Research Division (R& D)	ABD Distillery , MIDC Chikalthana, Aurangabad	Outside Jolly Board Ltd Chikalthana, Aurangabad	Outside Harman Finochem Ltd, MIDC Chikalthana
Sulphur Dioxide (SO_2)	µg/m³	25.20	15.30	21.84	7.97
Nitrogen Dioxide (NO_2)	µg/m³	BLQ	BLQ	BLQ	BLQ
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	55	66	62	67
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	16	18	17	18
Ozone (O_3)	µg/m³	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m³	0.16	0.20	0.14	0.14
Carbon Monoxide (CO) (1h)	mg/m³	1.06	1.06	1.04	1.12
Carbon Monoxide (CO) (8h)	mg/m³	1.37	1.46	1.43	1.48
Ammonia (NH_3)	µg/m³	57.40	61.80	67.40	49.90
Benzene (C_6H_6)	µg/m³	1.74	1.86	1.44	1.88
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	0.62	0.25	0.71	0.80
Nickel (Ni)	ng/m³	3.62	6.20	5.28	5.06

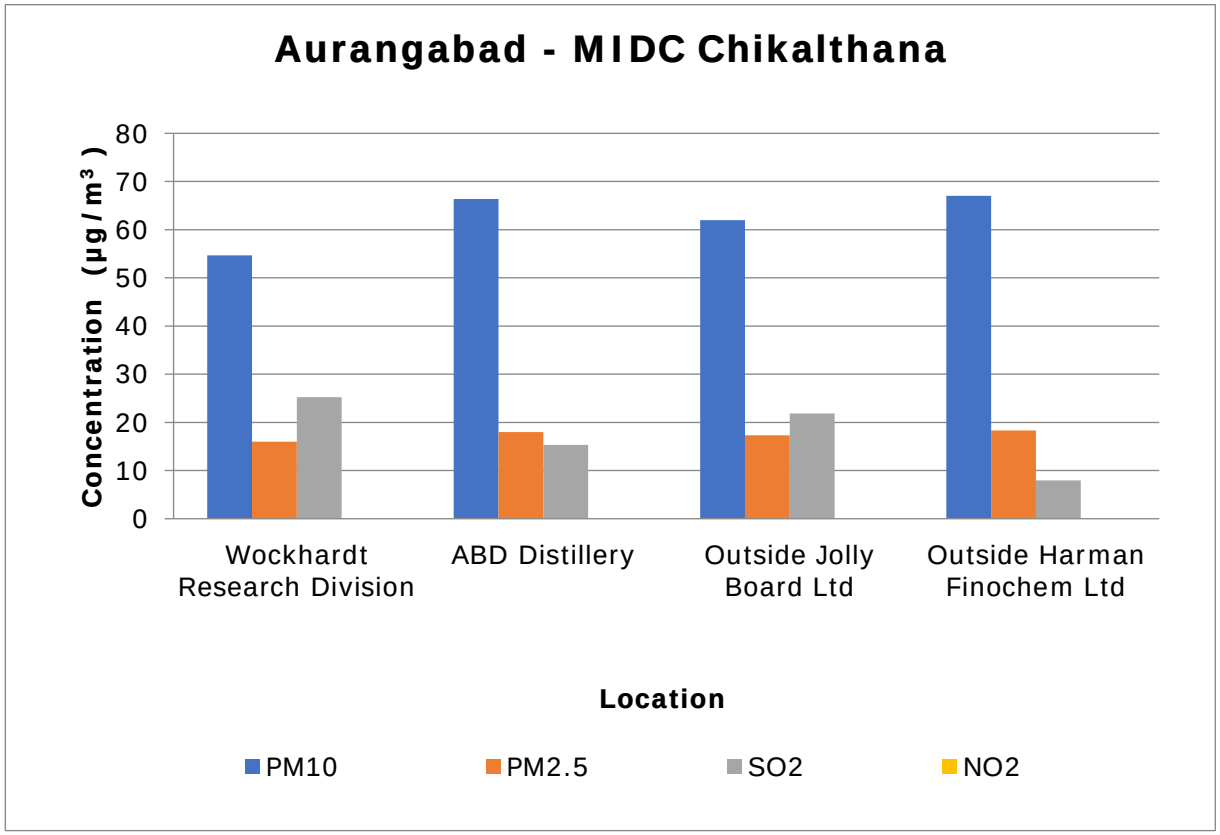
Table 5.8 MIDC Chikalthana - Volatile Organic Compounds (VOCs) in Ambient Air Results

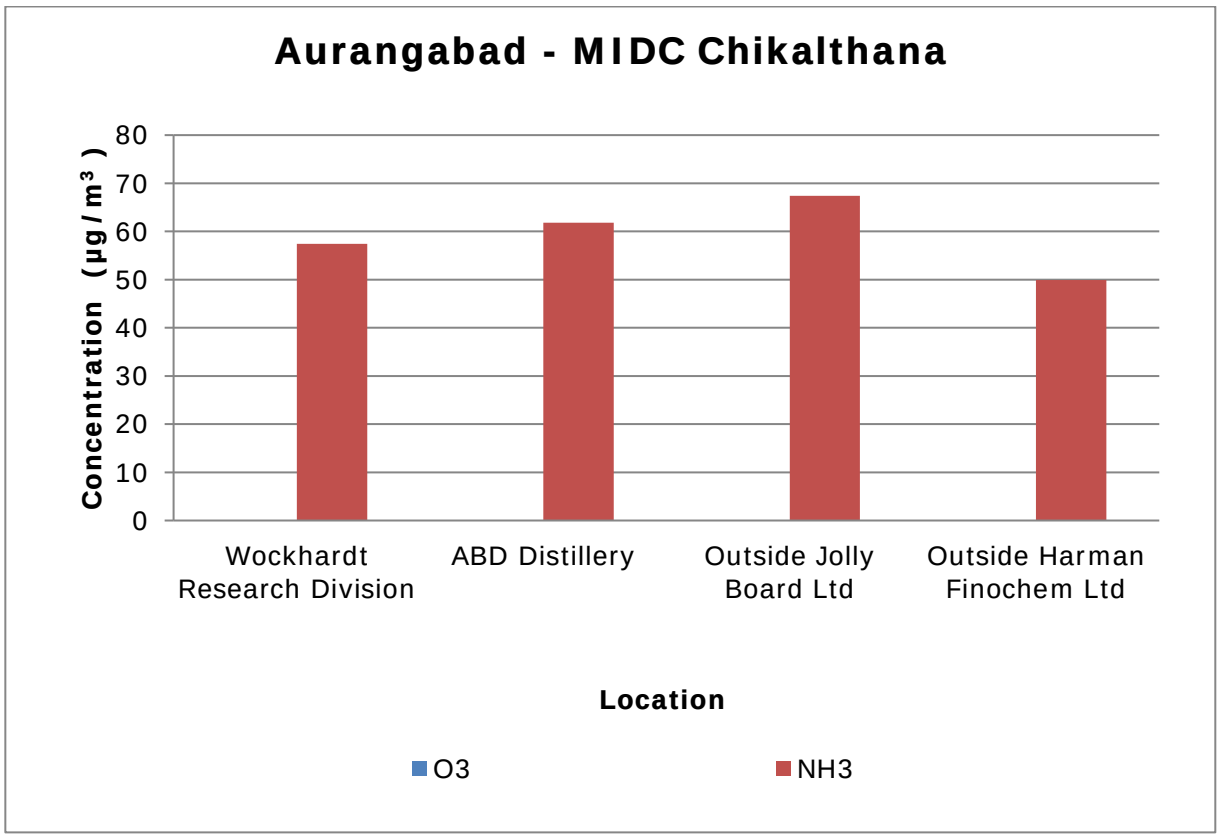
Parameters	Unit	Results	
		ABD Distillery	Outside Concept Pharma
Dichloromethane	µg/m³	4.18	2.36
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	5.40	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ

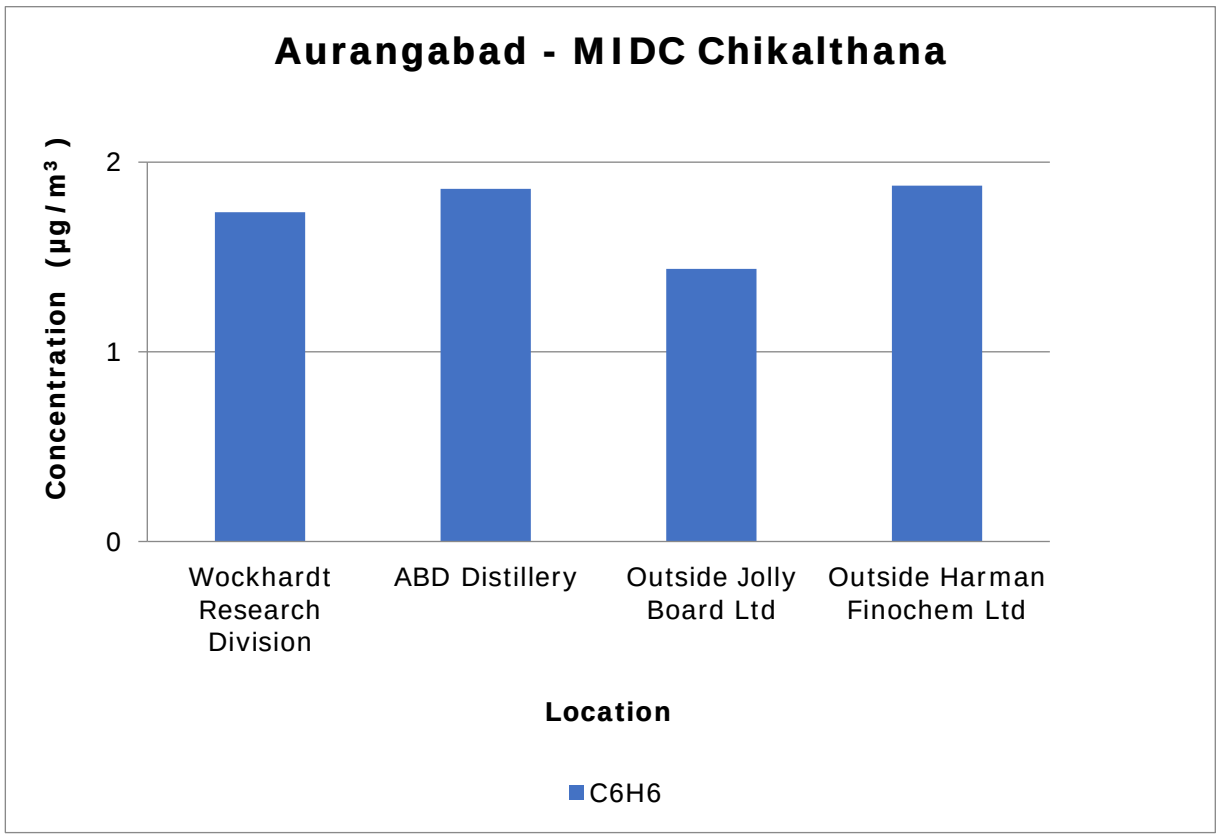
Parameters	Unit	Results	
		ABD Distillery	Outside Concept Pharma
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	5.4	BLQ
1,2-Dichloroethane	µg/m³	1.49	BLQ
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	3.38	1.16

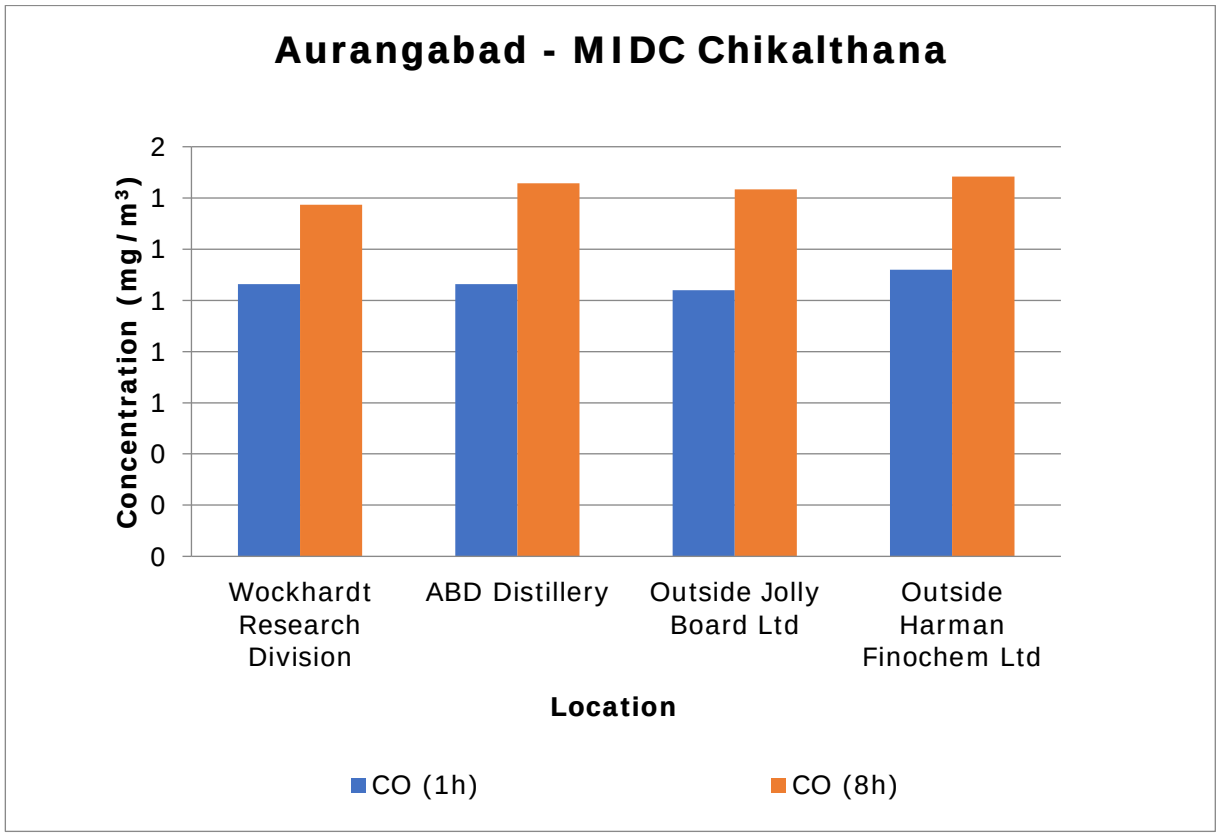
Parameters	Unit	Results	
		ABD Distillery	Outside Concept Pharma
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

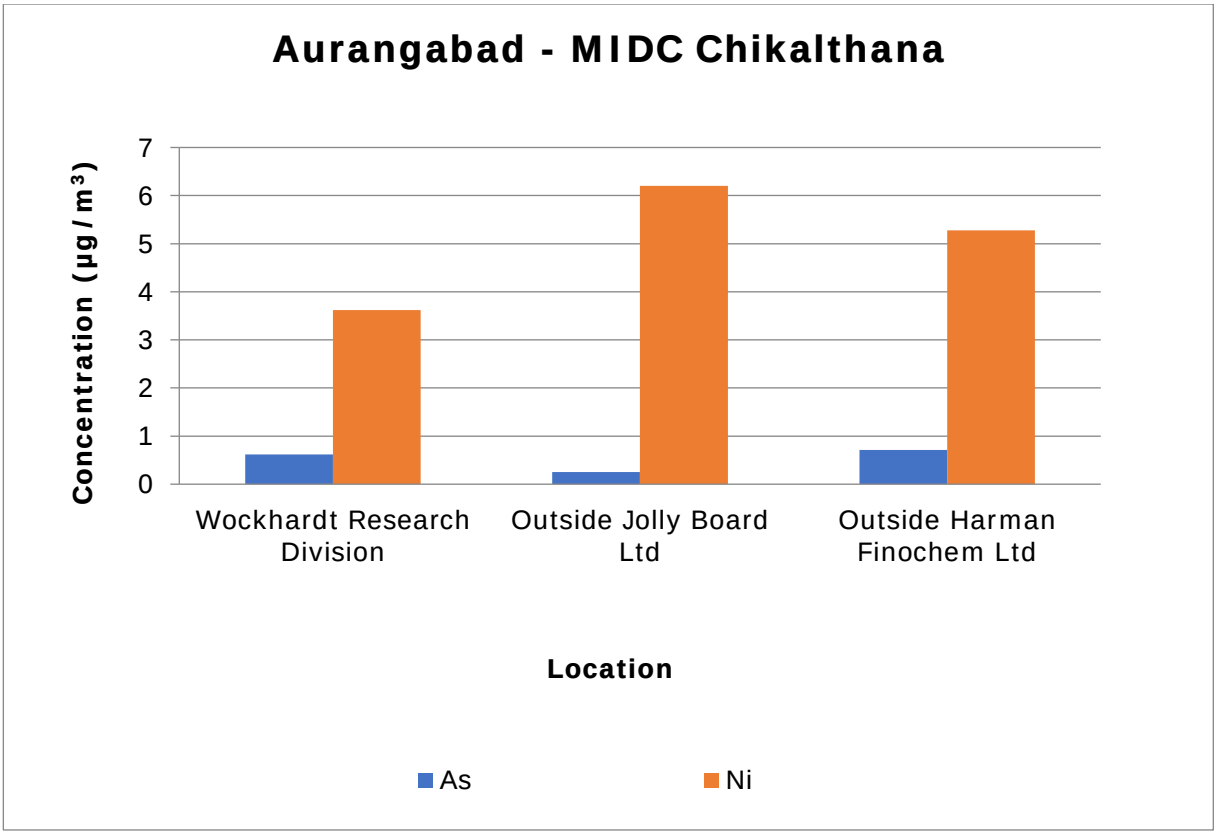
Graphs - Ambient Air Quality Monitoring - MIDC Chikalthana






Aurangabad - MIDC Chikalthana
Concentration (µg/m³)
2
1
0
Wockhardt Research Division
ABD Distillery
Outside Jolly Board Ltd
Outside Harman Finochem Ltd
Location
C6H6


Aurangabad - MIDC Chikalthana
Concentration (mg/m³)
2
1
1
1
1
1
0
0
0
Wockhardt Research Division
ABD Distillery
Outside Jolly Board Ltd
Outside Harman Finochem Ltd
Location
CO (1h)
CO (8h)


Aurangabad - MIDC Chikalthana
Concentration (µg/m³)
7
6
5
4
3
2
1
0
Wockhardt Research Division
Outside Jolly Board Ltd
Outside Harman Finochem Ltd
Location
As
Ni

3. **<u>MIDC Waluj</u>:** In MIDC Waluj, at all 4 locations monitored, the concentration of all the ambient air parameters was found within the limits of NAAQS, 2009. The monitoring of was carried out from 26th June to 30th June 2024. All the samples were collected in triplicate on an interval of one day.

Table 5.9 MIDC Waluj - Details of Sampling Location of Ambient Air Quality Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Goodyear South Asia tyres	19.85596N	75.207793E	26.06.2024	28.06.2024	30.06.2024
2.	DIPL	19.857228N	75.227627E	26.06.2024	28.06.2024	30.06.2024
3.	Varroc Plant VIII, Jogeshwari	19.83132N	75.201047E	26.06.2024	28.06.2024	30.06.2024
4.	Lilasons Brewaries, Waluj	19.859262N	75.218188E	26.06.2024	28.06.2024	30.06.2024

Table 5.10 MIDC Waluj - Details of Sampling Location of VOCs Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Outside of Endurance Tech.	19.85222N	75.205886E	26.06.2024	28.06.2024	30.06.2024
2.	DIPL	19.857228N	75.227627E	26.06.2024	28.06.2024	30.06.2024

Fig: Geographical Locations of Ambient Air Quality Monitoring MIDC Waluj

Fig: Geographical Locations of VOCs Monitoring MIDC Waluj

Table 5.11 MIDC Waluj - Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Goodyear South Asia Tyres	DIPL	Varroc Plant VIII, Jogeshwari	Lilasons Brewaries, Waluj
Sulphur Dioxide (SO_2)	µg/m³	10.19	14.60	14.69	13.60
Nitrogen Dioxide (NO_2)	µg/m³	BLQ	BLQ	BLQ	BLQ
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	56	59	53	59
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	16	17	14	16
Ozone (O_3)	µg/m³	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m³	0.19	0.24	0.13	0.17
Carbon Monoxide (CO) (1 h)	mg/m³	1.27	1.35	1.41	1.46
Carbon Monoxide (CO) (8 h)	mg/m³	1.51	1.52	1.72	1.82
Ammonia (NH_3)	µg/m³	66.05	68.80	53.35	57.30
Benzene (C_6H_6)	µg/m³	1.90	1.75	1.75	1.66
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	0.58	0.53	0.69	0.70
Nickel (Ni)	ng/m³	5.86	7.30	7.42	6.84

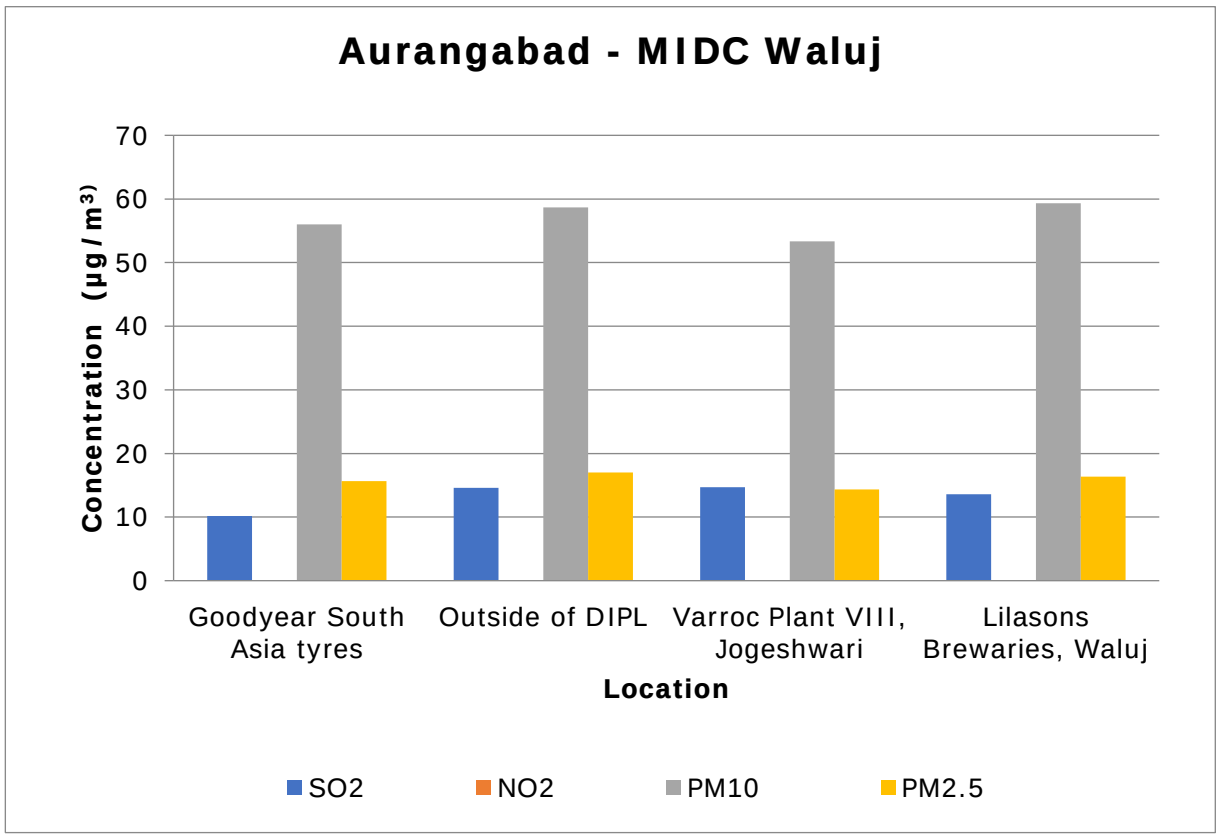
Table 5.12 MIDC Waluj - Volatile Organic Compounds (VOCs) in Ambient Air Results

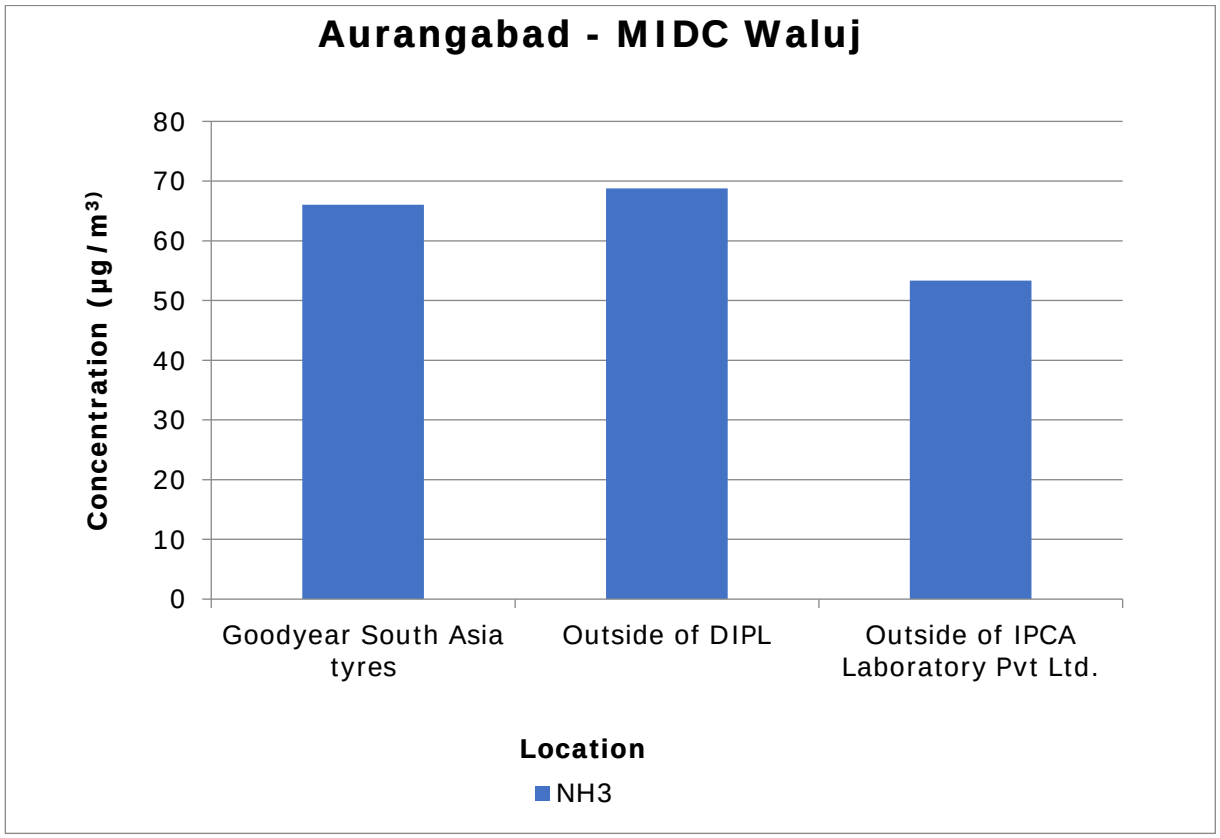
Parameters	Unit	Results	
		DIPL	Endurance Tech, K-120
Dichloromethane	µg/m³	0.87	1.46
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ

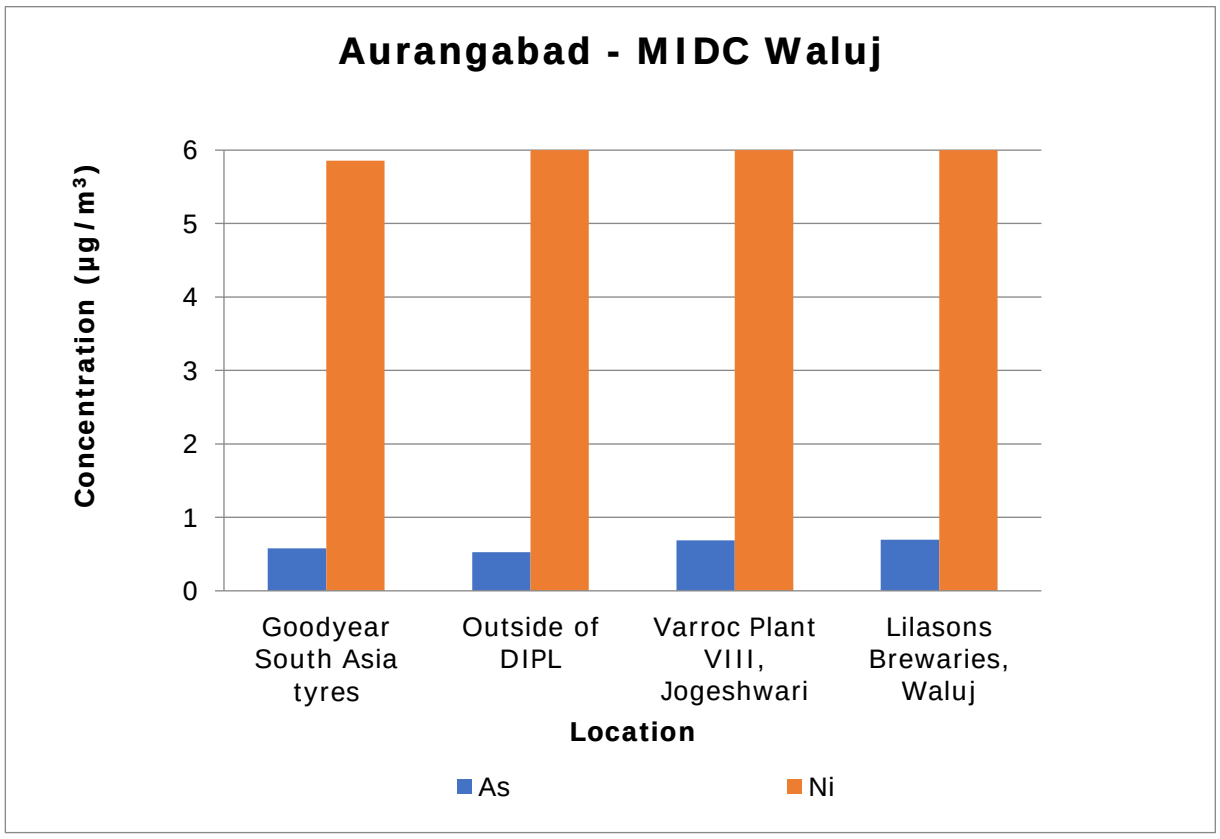
Parameters	Unit	Results	
		DIPL	Endurance Tech, K-120
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	0.52
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	BLQ
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	1.23	0.77
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ

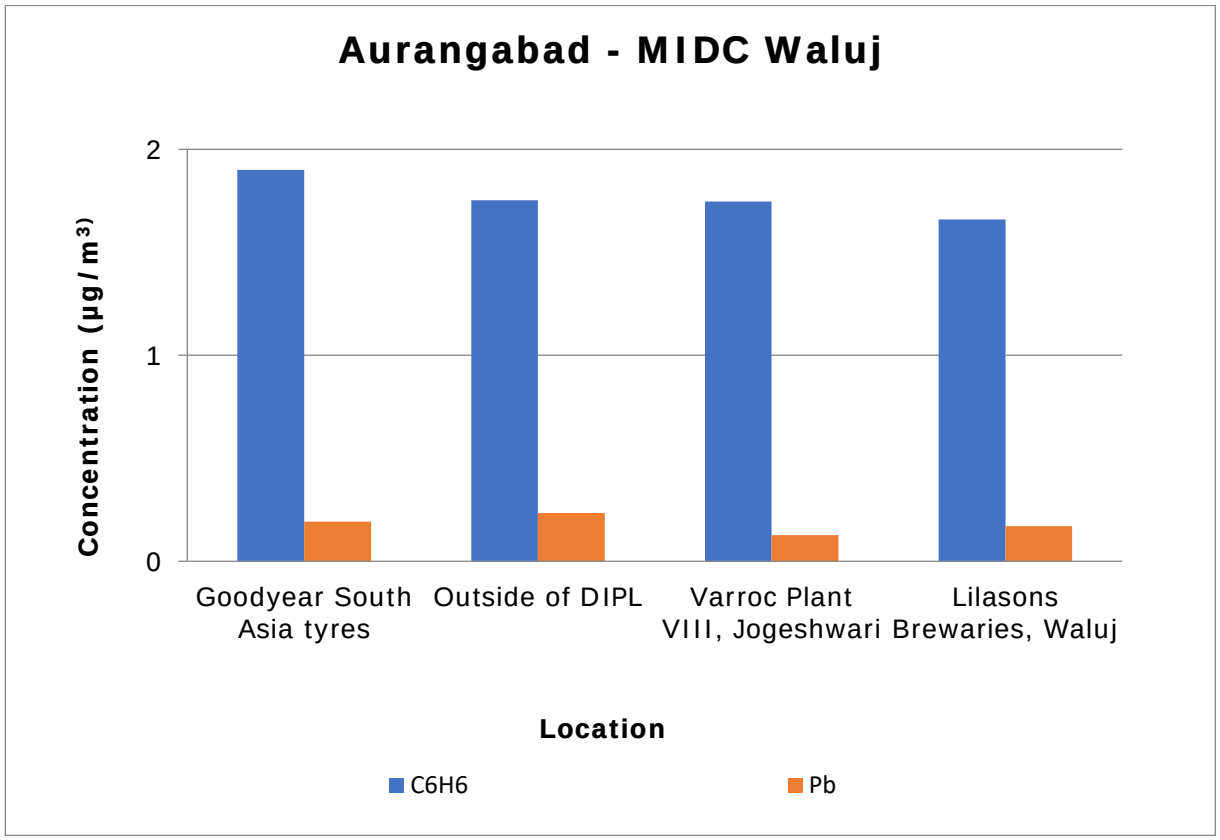
Parameters	Unit	Results	
		DIPL	Endurance Tech, K-120
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

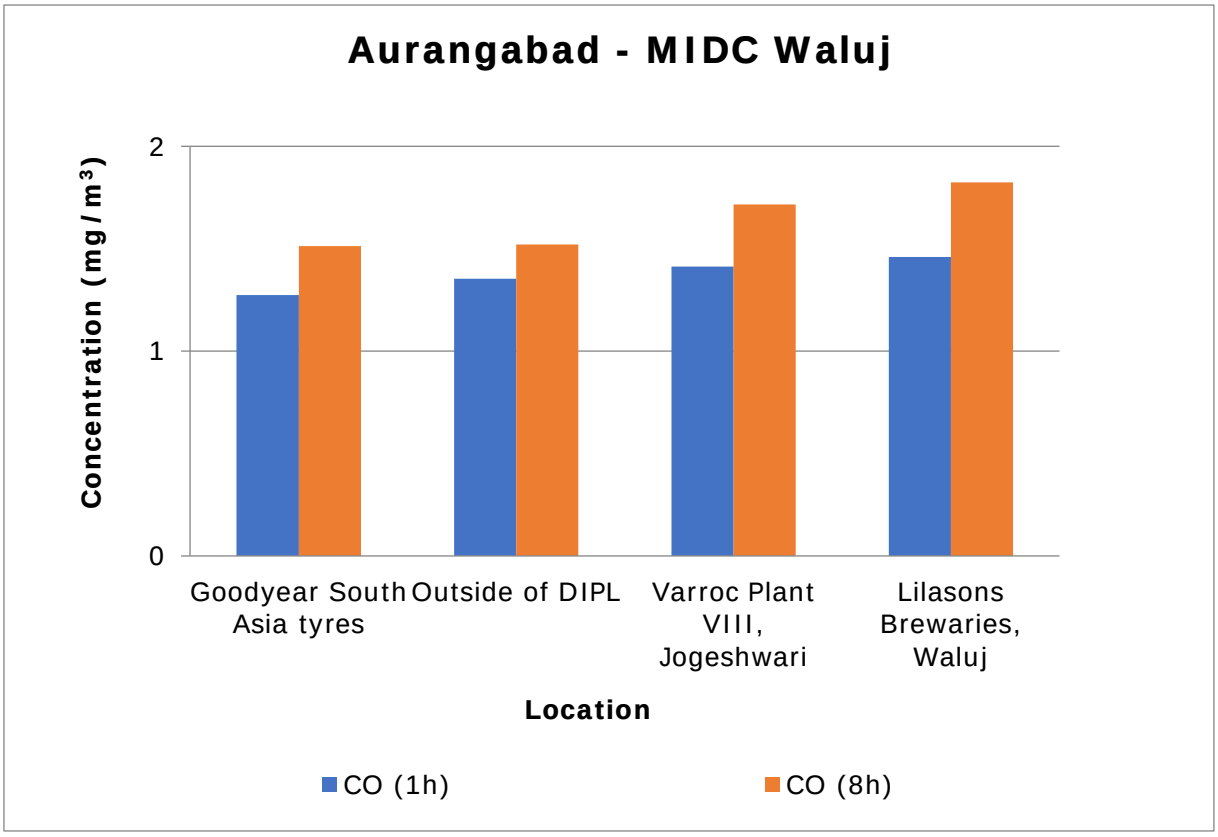
Graphs - Ambient Air Quality Monitoring - MIDC Waluj






Aurangabad - MIDC Waluj
Concentration (µg/m³)
6
5
4
3
2
1
0
Goodyear South Asia tyres
Outside of DIPL
Varroc Plant VIII, Jogeshwari
Lilasons Brewaries, Waluj
Location
As
Ni


Aurangabad - MIDC Waluj
Concentration (µg/m³)
2
1
0
Goodyear South Asia tyres
Outside of DIPL
Varroc Plant VIII, Jogeshwari
Lilasons Brewaries, Waluj
Location
C6H6
Pb


Aurangabad - MIDC Waluj
Concentration (mg/m³)
2
1
0
Goodyear South Asia tyres
Outside of DIPL
Varroc Plant VIII, Jogeshwari
Lilasons Breweries, Waluj
Location
CO (1h)
CO (8h)

4. **MIDC Paithan:** In MIDC Paithan, at all the 4 locations monitored, the concentration of all the ambient air parameters was found within the permissible limits of NAAQS.

Table 5.13 MIDC Paithan - Details of Sampling Location of Ambient Air Quality Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Belrise Industries Ltd (old name Badve engineering), vill khandewadi,	19.787247N	75.290013E	26.06.2024	28.06.2024	30.06.2024
2.	CIE Alluminium Casting India Pvt Ltd old name Aurangabad Electrical	19.75526N	75.29769E	26.06.2024	28.06.2024	30.06.2024
3.	Allana Frigarifico	19.775425N	75.29085E	26.06.2024	28.06.2024	30.06.2024
4.	Outside of Machhar Packaging	19.74184N	75.295073E	26.06.2024	28.06.2024	30.06.2024

Table 5.14 MIDC Paithan - Details of Sampling Location of VOCs Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Belrise Industries Outside of Badve Engineering	19.787247N	75.290013E	26.06.2024	28.06.2024	30.06.2024
2.	CIE Alluminium Aurangabad Electrical, Unit III	19.75526N	75.29769E	26.06.2024	28.06.2024	30.06.2024

Fig: Geographical Locations of Ambient Air Quality Monitoring MIDC Paithan

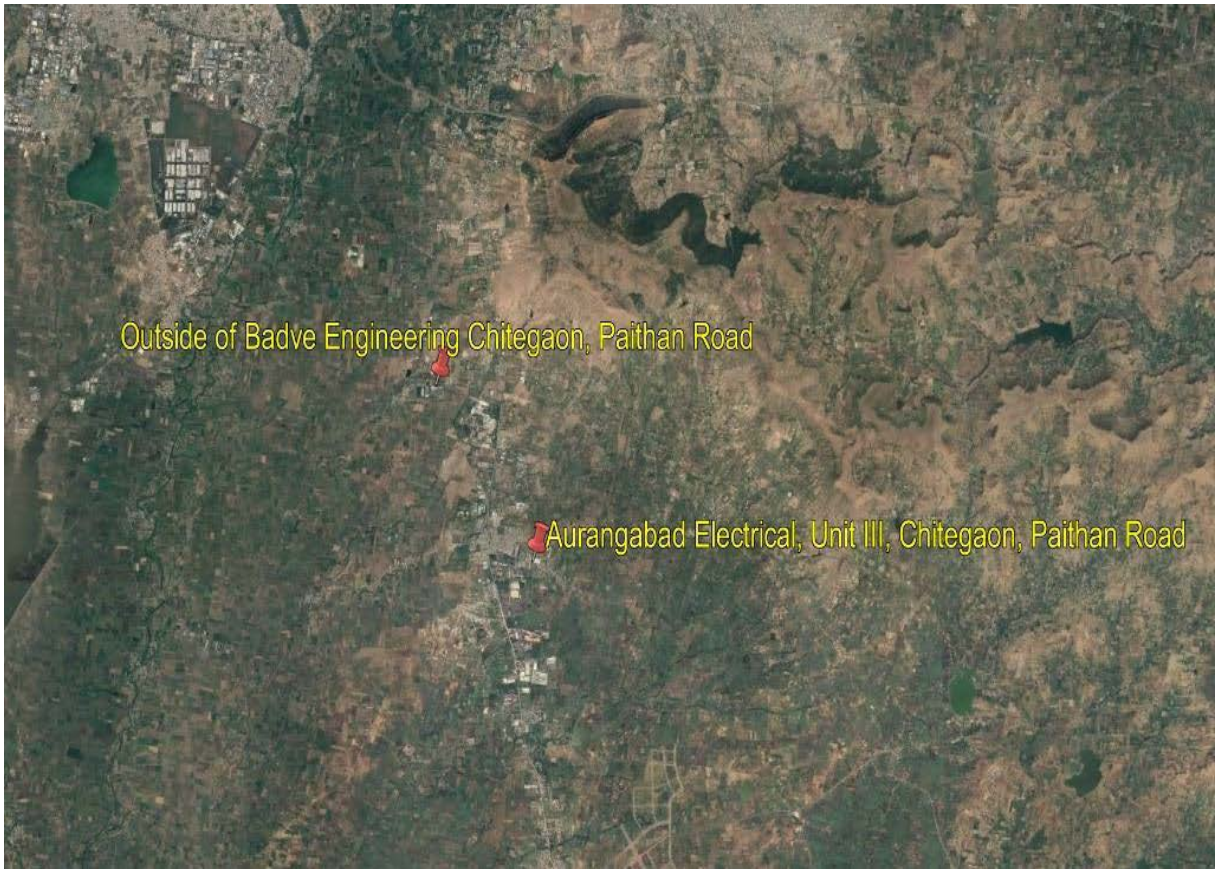


Fig: Geographical Locations of VOCs Monitoring MIDC Paithan

Table 5.15 MIDC Paithan- Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Belrise Industries Ltd	CIE Alluminium Casting India Pvt Ltd	Allana Frigarifico	Outside of Machhar Packaging
Sulphur Dioxide (SO_2)	µg/m³	25.40	22.80	25.90	10.30
Nitrogen Dioxide (NO_2)	µg/m³	BLQ	10.20	BLQ	BLQ
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	53	61	66	59
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	15	18	20	16
Ozone (O_3)	µg/m³	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m³	0.14	0.18	0.16	0.11
Carbon Monoxide (CO) (1 h)	mg/m³	1.24	1.31	1.30	1.11
Carbon Monoxide (CO) (8 h)	mg/m³	1.53	1.52	1.54	1.39
Ammonia (NH_3)	µg/m³	53.55	69.80	77.50	75.05
Benzene (C_6H_6)	µg/m³	1.83	1.98	1.96	2.07
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	0.66	0.60	0.70	0.76
Nickel (Ni)	ng/m³	5.12	4.28	5.14	3.02

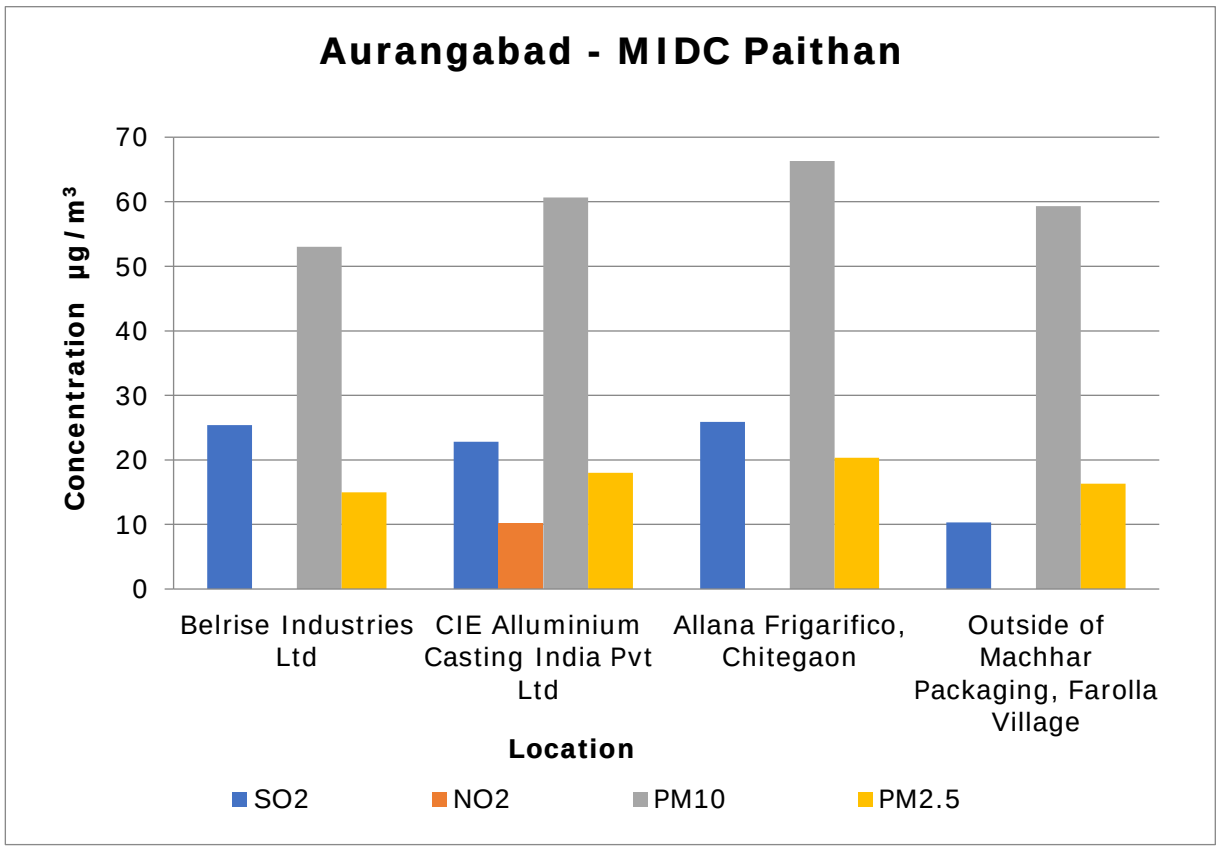
Table 5.16 MIDC Paithan- Volatile Organic Compounds (VOCs) in Ambient Air Results

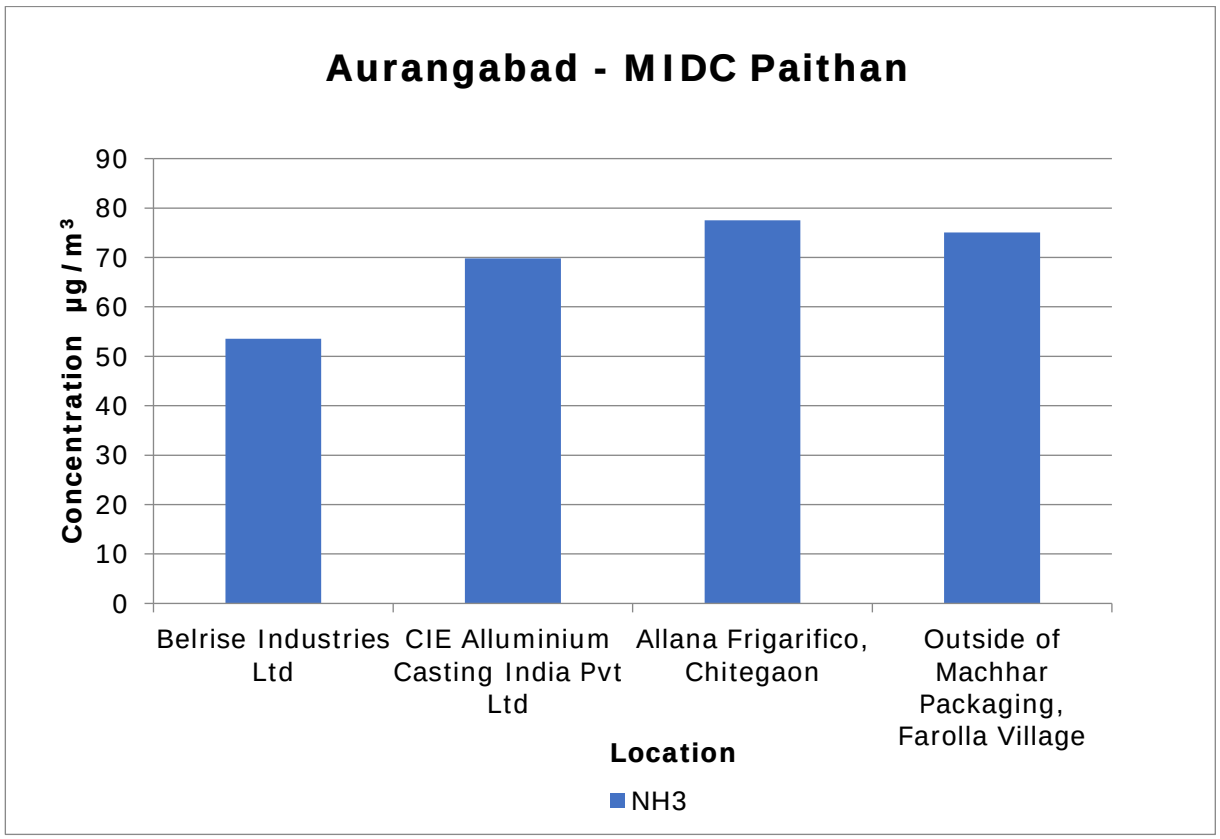
Parameters	Unit	Results	
		Belrise Industries Ltd	CIE Alluminium Casting India Pvt Ltd
Dichloromethane	µg/m³	0.68	1.23
Chloroform	µg/m³	0.51	0.51
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ

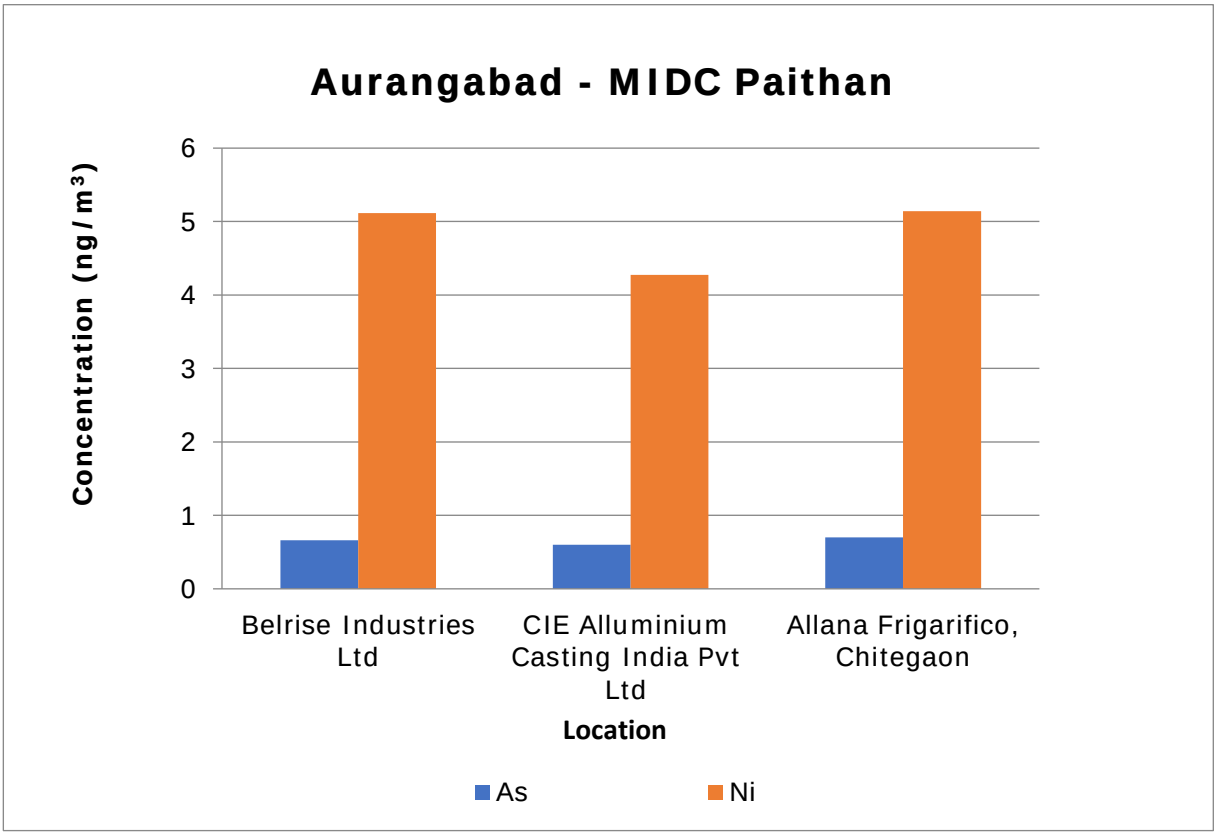
Parameters	Unit	Results	
		Belrise Industries Ltd	CIE Alluminium Casting India Pvt Ltd
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	BLQ
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	0.86	0.68
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	BLQ	BLQ

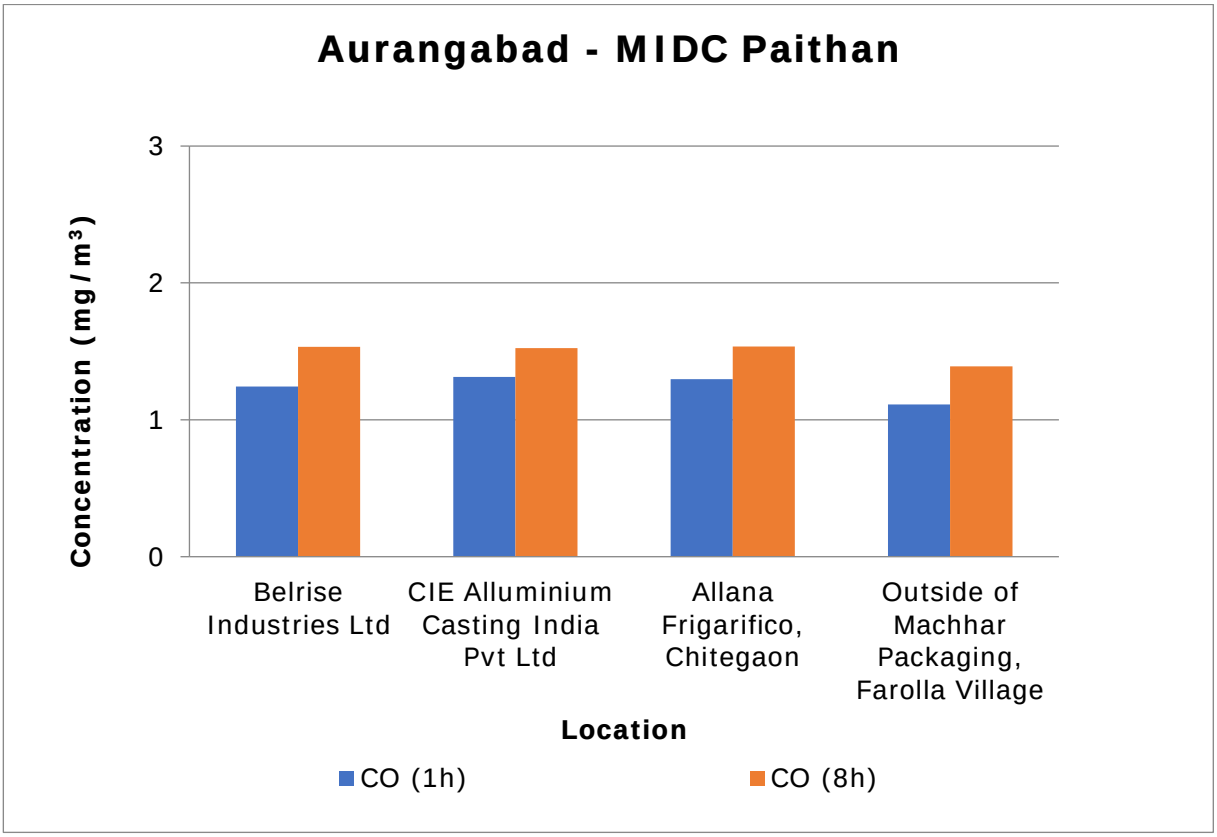
Parameters	Unit	Results	
		Belrise Industries Ltd	CIE Alluminium Casting India Pvt Ltd
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	0.86	0.68
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

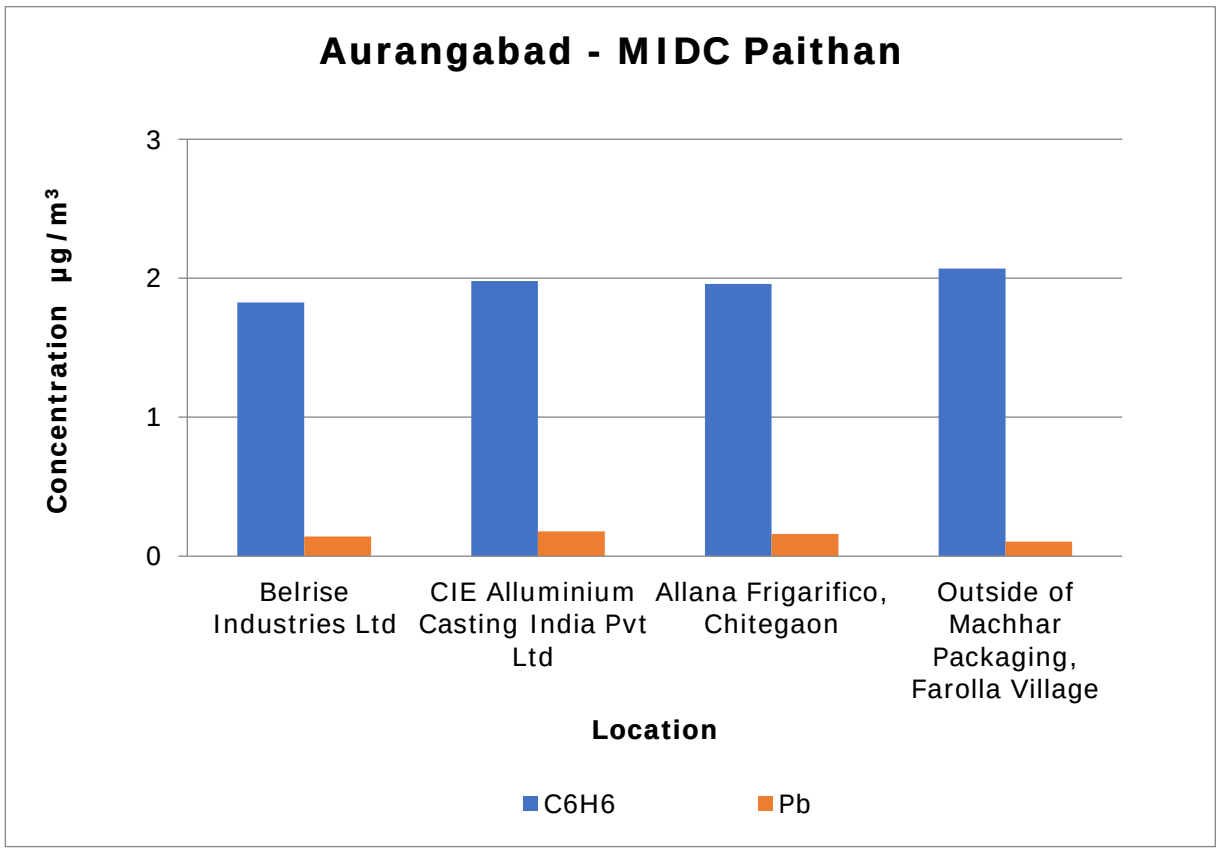
Graphs - Ambient Air Quality Monitoring of MIDC Paithan






Aurangabad - MIDC Paithan
Concentration (ng/m³)
6
5
4
3
2
1
0
Belrise Industries Ltd
CIE Alluminium Casting India Pvt Ltd
Allana Frigarifico, Chitegaon
Location
As
Ni


Aurangabad - MIDC Paithan
Concentration (mg/m³)
3
2
1
0
Belrise Industries Ltd
CIE Alluminium Casting India Pvt Ltd
Allana Frigarifico, Chitegaon
Outside of Machhar Packaging, Farolla Village
Location
CO (1h)
CO (8h)


Aurangabad - MIDC Paithan
Concentration µg/m³
3
2
1
0
Belrise Industries Ltd
CIE Alluminium Casting India Pvt Ltd
Allana Frigarifico, Chitegaon
Outside of Machhar Packaging, Farolla Village
Location
C6H6
Pb

WATER ENVIRONMENT

6. Water Environment

For studying the water environment of Aurangabad area, six samples of surface water were collected from Nallah, Lake and River. A total of 23 samples were collected from all four MIDCs i.e. six samples from each MIDC except Chikalthana, from where five samples were collected. In comparison to the post monsoon season study, few of the water sources were found dried, hence those were replaced with another nearby source.

1. **MIDC Shendra:** Six surface water samples were collected from the MIDC Shendra region.

- General parameters like pH, dissolved oxygen (DO), electrical conductivity and suspended solids are also observed well within the limits in all the samples.
- Concentration of Biological Oxygen Demand (BOD) was observed to exceed the permissible limit at two locations. The highest concentration of BOD (136mg/L) is observed in nallah water near Jyoti industry.
- Concentration of Total Dissolved Solids (TDS) and Total Kjeldahl Nitrogen (TKN) was also found within the acceptable limits in all water samples.
- In fish bioassay, 100% fish survival was observed in the water sample of Nalla water sample behind Inox Air product.
- All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr^{6+}) etc. are also observed either below the limit of quantification (BLQ) or below their standard limits.
- Parameters like Total Residual Chlorine, Nitrogen, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB in all the samples except in lake water near Radico Distillery.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are also observed below the limit of quantification in all the studied samples.

Table 6.1 MIDC Shendra - Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Lake Water Ladgaon Lake, MIDC	19.861202N	75.528740E	25.06.2024	27.06.2024	29.06.2024
2.	Auric City CETP outlet	19.8728N	75.522658E	25.06.2024	27.06.2024	29.06.2024
3.	Nallah Water Near Jyoti Industry	19.879578N	75.494647E	25.06.2024	27.06.2024	29.06.2024
4.	Nallah Water Back side Perkins Shendra	19.8805082N	75.513443E	25.06.2024	27.06.2024	29.06.2024
5.	Pond Water in front of Auric City Office	19.87515N	75.507939E	25.06.2024	27.06.2024	29.06.2024

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
6.	Nallah Water Behind Inox Air Product	19.875448N	75.524596E	25.06.2024	27.06.2024	29.06.2024

Fig: Geographical Locations of Surface Water Sampling MIDC Shendra

Table 6.2 MIDC Shendra – Results of Surface Water

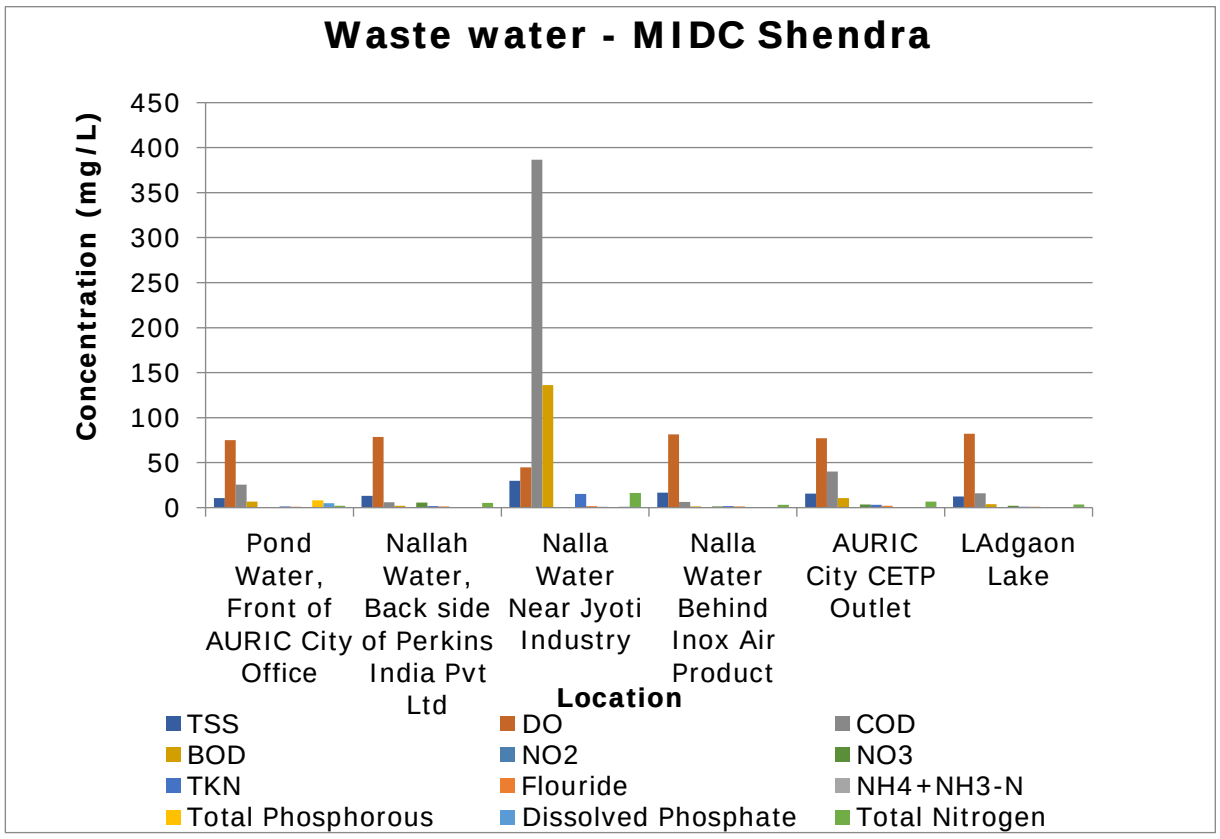
Parameters	Unit	Results					
		Pond Water, Front of Auric City Office	Nallah Water, Back side of Perkins India Pvt Ltd	Nalla Water Near Jyoti Industry	Nalla Water Behind Inox Air Product	CETP Outlet Auric City	Ladgaon Lake, MIDC
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Very clean neighbourhood and catchment	Reasonably clean neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter evident	Floating Matter evident	No Floating Matter	Floating Matter evident
Transparency	m	0.30	0.30	0.20	0.30	2.10	0.50
Temperature	^{o}C	31	31	31	30	31	31
Colour	Hazen	1	2	6	1	1	1
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

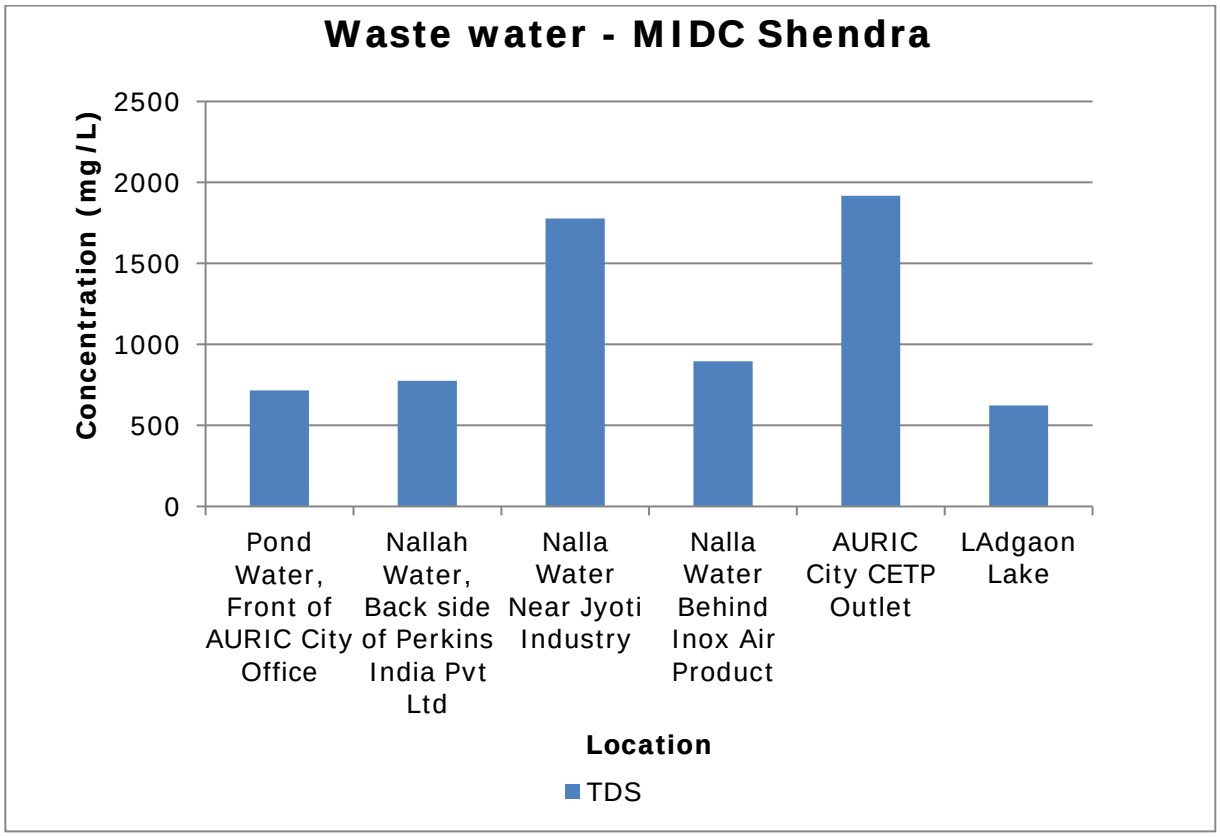
Parameters	Unit	Results					
		Pond Water, Front of Auric City Office	Nallah Water, Back side of Perkins India Pvt Ltd	Nalla Water Near Jyoti Industry	Nalla Water Behind Inox Air Product	CETP Outlet Auric City	Ladgaon Lake, MIDC
pH	-	7.86	8.09	7.67	7.95	7.90	8.07
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	10.67	13.00	30.00	16.67	15.67	12.33
Total Dissolved Solids	mg/L	715	775	1778	895	1917	624
Dissolved Oxygen (% Saturation)	%	75.00	78.67	44.67	81.33	77.00	82.00
Chemical Oxygen Demand	mg/L	26	6	387	6	40	16
Biochemical Oxygen Demand (3 days,27°C)	mg/L	7	2	136	1	11	4
Electrical Conductivity (at 25 °C)	µmho / cm	1277	1384	3175	1598	3423	1114
Nitrite Nitrogen (as NO_2)	mg/L	0.07	0.03	0.07	0.02	0.46	0.48
Nitrate Nitrogen (as NO_3)	mg/L	0.81	5.52	0.83	1.22	3.35	2.25
(NO_2 + NO_3)-Nitrogen	mg/L	0.85	5.54	0.89	1.22	3.81	2.47
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.46	0.24	0.35	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.20	1.37	1.80	1.33	2.07	1.13
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	5.00	0.14	0.85	BLQ	0.20	BLQ
Sodium Adsorption Ratio	-	0.71	0.82	0.70	0.75	0.65	1.17
Total Coliforms	MPN Index / 100 ml	350	844	1373	1600	123	43
Faecal Coliforms	MPN Index / 100 ml	315	635	767	394	11	9

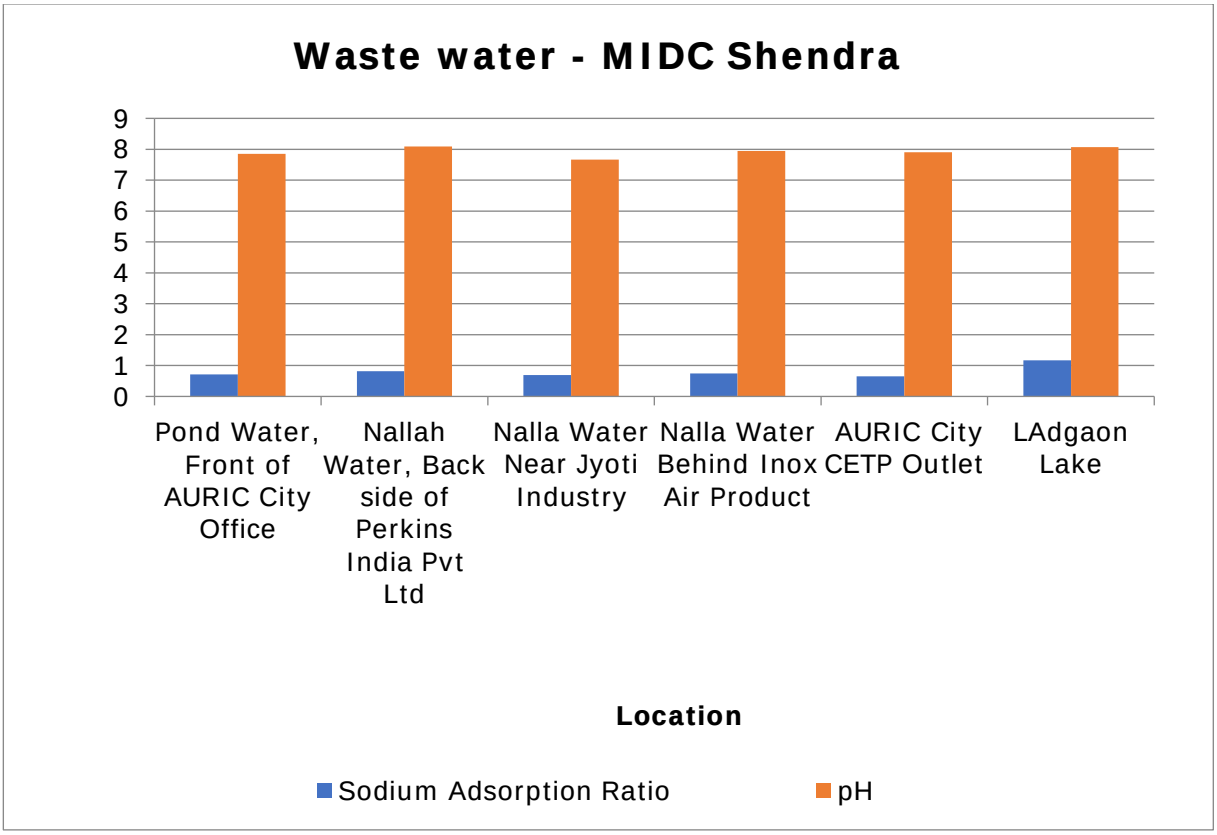
Parameters	Unit	Results					
		Pond Water, Front of Auric City Office	Nallah Water, Back side of Perkins India Pvt Ltd	Nalla Water Near Jyoti Industry	Nalla Water Behind Inox Air Product	CETP Outlet Auric City	Ladgaon Lake, MIDC
Total Phosphate (as P)	mg/L	8.00	0.24	0.55	0.30	0.50	0.20
Total Kjeldahl Nitrogen (as N)	mg/L	1.27	1.60	15.33	1.79	3.03	0.86
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.13	0.13	1.08	0.23	0.21	0.24
Total Nitrogen	mg/L	2.12	5.30	16.21	3.02	6.85	3.42
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	0.00	0.00	0.00	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.13	BLQ	0.07	BLQ	BLQ
Nickel (as Ni)	mg/L	0.01	0.01	0.01	0.02	0.01	BLQ
Copper (as Cu)	mg/L	BLQ	0.03	BLQ	0.05	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	0.04
Total Arsenic (as As)	mg/L	0.01	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.02	BLQ	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.08	0.04	0.46	0.09	0.04	0.02
Iron (as Fe)	mg/L	0.14	0.63	0.33	0.40	0.32	0.26
Vanadium (as V)	mg/L	0.02	0.08	0.03	0.01	0.03	0.03

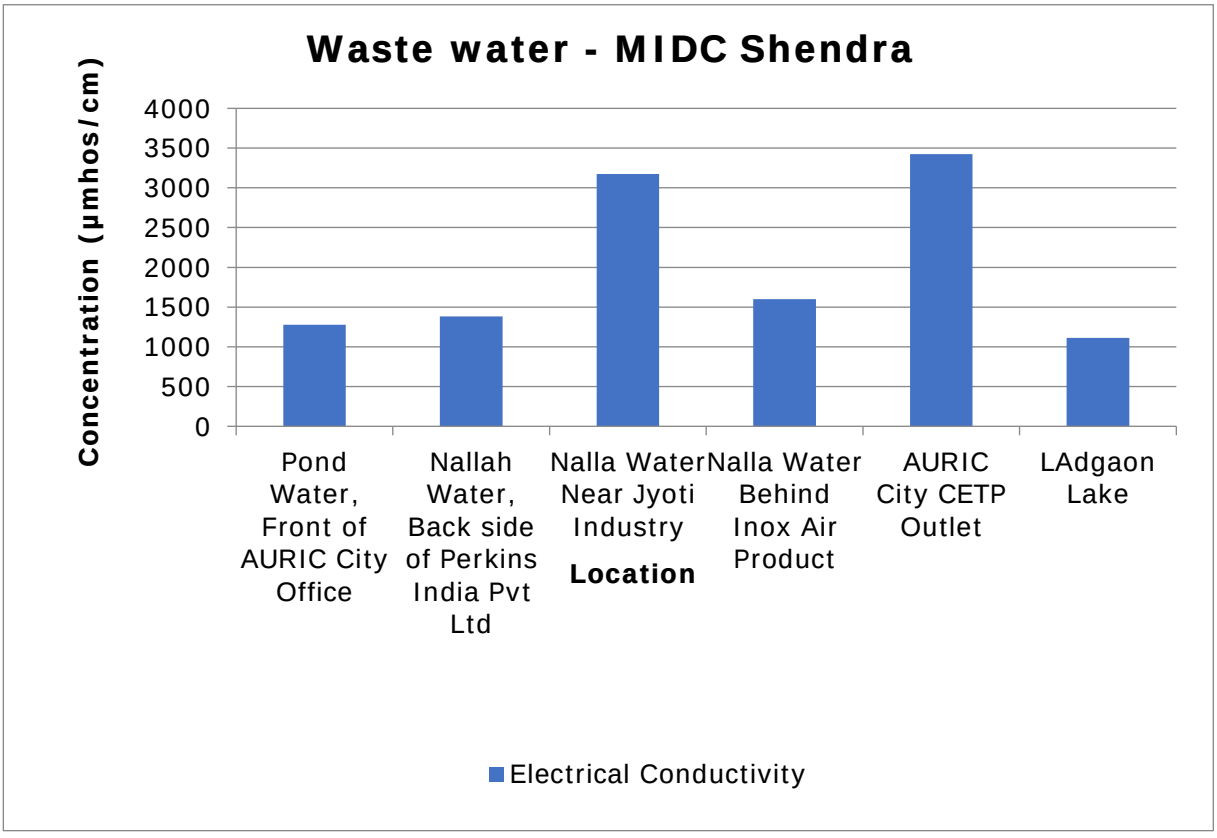
Parameters	Unit	Results					
		Pond Water, Front of Auric City Office	Nallah Water, Back side of Perkins India Pvt Ltd	Nalla Water Near Jyoti Industry	Nalla Water Behind Inox Air Product	CETP Outlet Auric City	Ladgaon Lake, MIDC
Selenium (as Se)	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
Boron (as B)	mg/L	0.62	0.30	0.47	0.21	0.31	0.47
Bioassay Test on fish	% survival	73	80	13	100	80	80

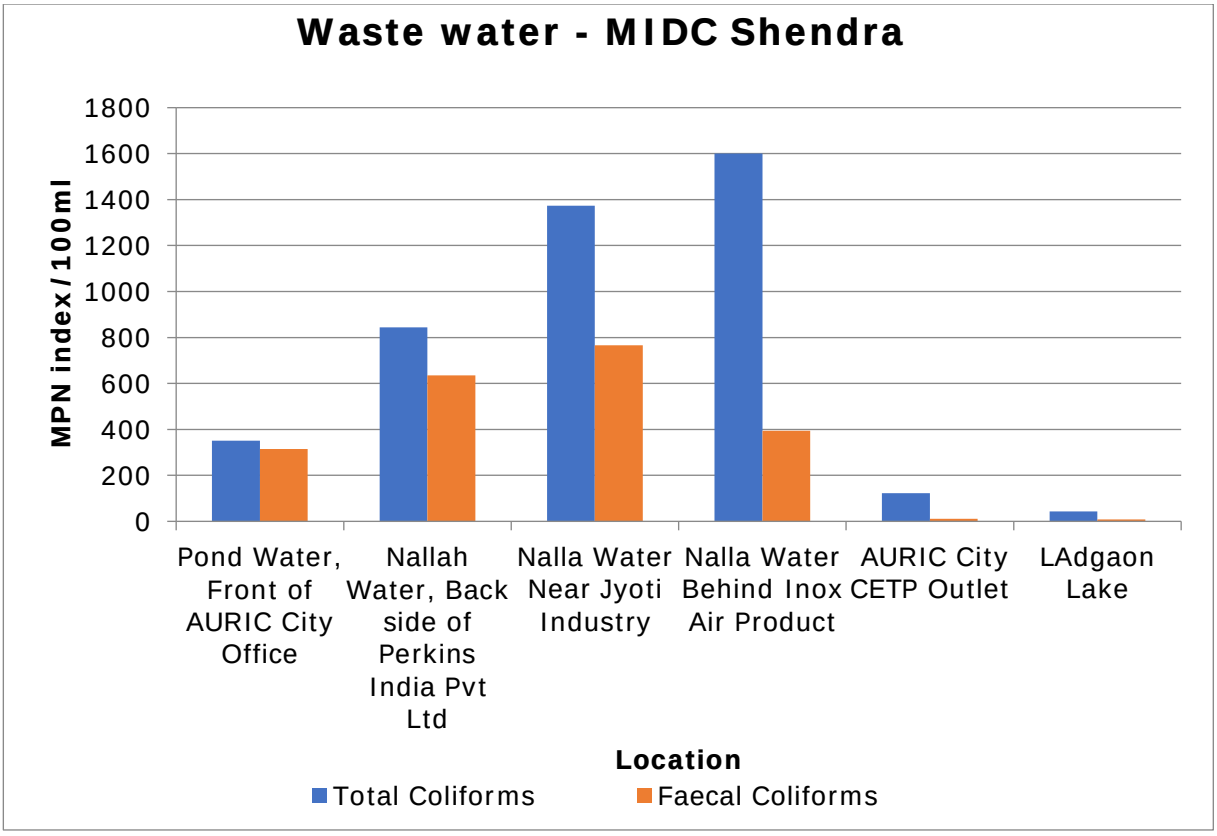
Graphs - Surface water of MIDC Shendra

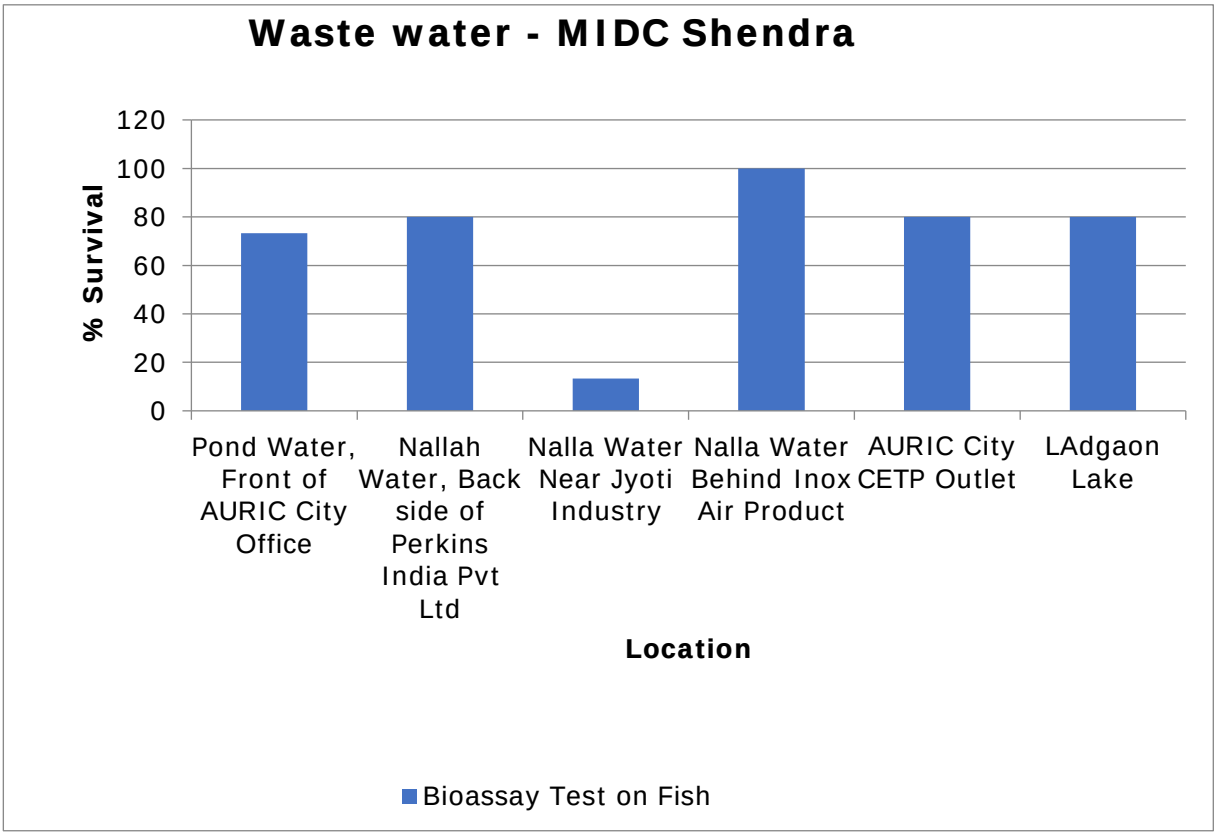





Waste water - MIDC Shendra
9
8
7
6
5
4
3
2
1
0
Pond Water, Front of AURIC City Office
Nallah Water, Back side of Perkins India Pvt Ltd
Nalla Water Near Jyoti Industry
Nalla Water Behind Inox Air Product
AURIC City CETP Outlet
LAdgaon Lake
Location
Sodium Adsorption Ratio
pH


Waste water - MIDC Shendra
Concentration (µmhos/cm)
4000
3500
3000
2500
2000
1500
1000
500
0
Pond Water, Front of AURIC City Office
Nallah Water, Back side of Perkins India Pvt Ltd
Nalla Water Near Jyoti Industry
Nalla Water Behind Inox Air Product
AURIC City CETP Outlet
LAdgaon Lake
Location
Electrical Conductivity


Waste water - MIDC Shendra
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Pond Water, Front of AURIC City Office
Nallah Water, Back side of Perkins India Pvt Ltd
Nalla Water Near Jyoti Industry
Nalla Water Behind Inox Air Product
AURIC City CETP Outlet
LAdgaon Lake
Location
Total Coliforms
Faecal Coliforms


Waste water - MIDC Shendra
% Survival
120
100
80
60
40
20
0
Pond Water, Front of AURIC City Office
Nallah Water, Back side of Perkins India Pvt Ltd
Nalla Water Near Jyoti Industry
Nalla Water Behind Inox Air Product
AURIC City CETP Outlet
LAdgaon Lake
Location
Bioassay Test on Fish

2. **MIDC Chikalthana:** From MIDC Chikalthana also, five surface water samples were collected.

- All the water samples collected were found acceptable in general appearance.
- General parameters like pH, electrical conductivity, suspended solids and Total Dissolved Solids (TDS) were also observed well within the limits in all the samples except water sample of Sukna dam.
- Concentration of Biological Oxygen Demand (BOD) is found above acceptable limits in the water sample of Sukna Dam.
- Concentration of Fluoride is found to exceed the acceptable limit in the water samples of STP Outlet Zalta phata.
- In fish bioassay, 100% survival of fishes was achieved in water sample of Harsul lake.
- Metals such as Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. were also observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Nitrogen, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are also observed below the limit of quantification in all the studied samples.

Table 6.3 MIDC Chikalthana - Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Sukna Dam	19.815305N	75.520218E	25.06.2024	27.0.2024	29.06.2024
2.	Harsul lake	19.923229N	75.335446E	25.06.2024	27.0.2024	29.06.2024
3.	STP Outlet Zalta phata	19.853173N	75.418691E	25.06.2024	27.0.2024	29.06.2024
4.	Sukana River Near Shani Mandir	19.858902N	75.414698E	25.06.2024	27.0.2024	29.06.2024
5.	Lake Water, Salim Ali Sarovar	19.898799N	75.33897E	25.06.2024	27.0.2024	29.06.2024

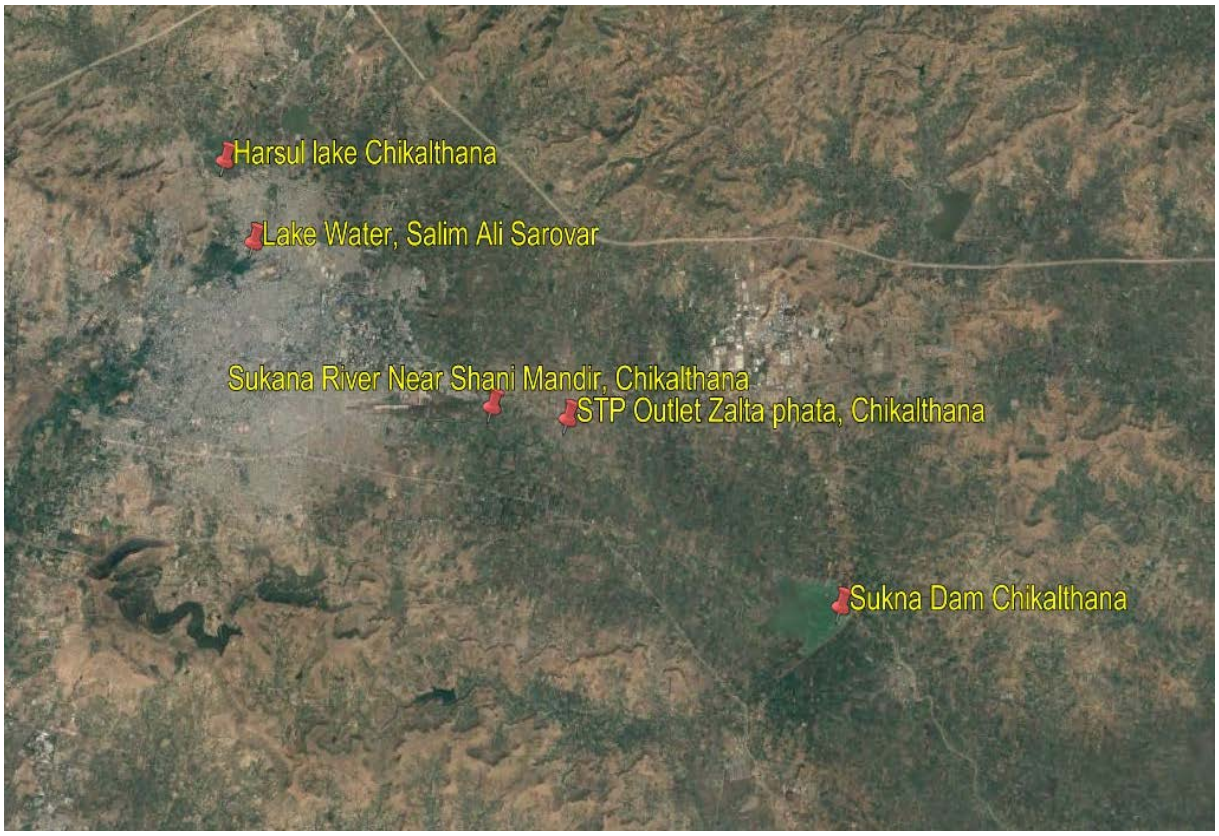


Fig: Geographical Locations of Surface Water Sampling MIDC Chikalthana

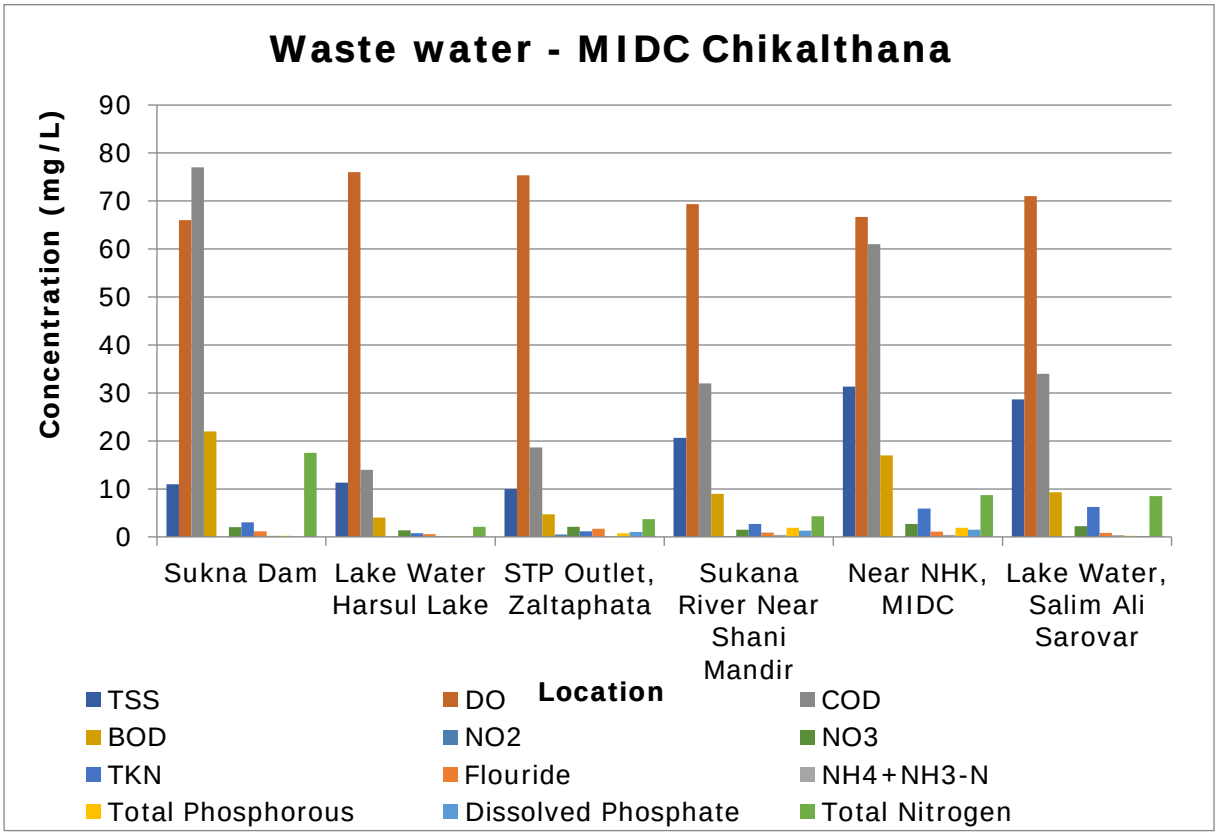
Table 6.4 MIDC Chikalthana - Results of Surface Water

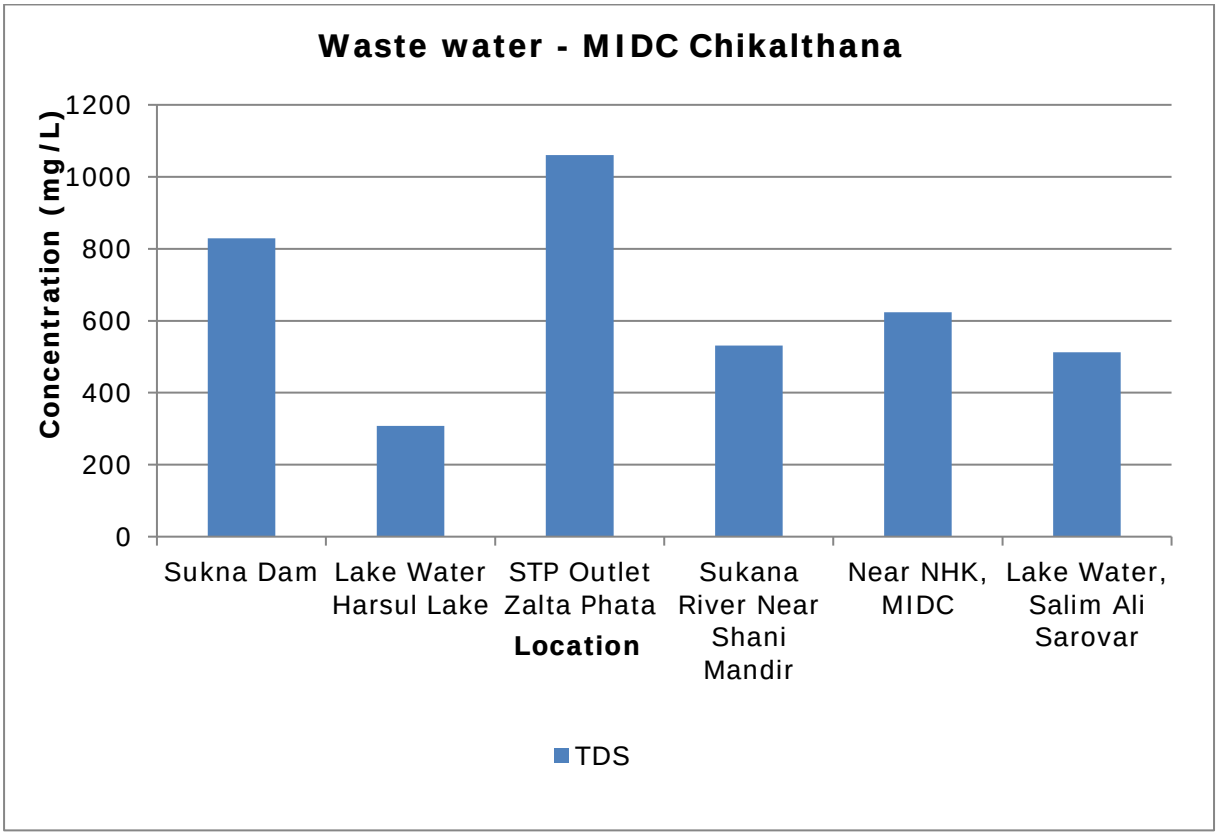
Parameters	Unit	Results				
		Sukna Dam	Lake Water Harsul Lake	STP Outlet Zalta Phata	Sukana River Near Shani Mandir	Lake Water, Salim Ali Sarovar
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	Floating Matter evident	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.80	0.50	0.40	0.30	0.40
Temperature	^{o}C	30	30	30	30	30
Colour	Hazen	2	1	1	1	4
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ
pH	-	9.08	8.22	7.95	7.58	7.87
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	11.00	11.33	10.00	20.67	28.67
Total Dissolved Solids	mg/L	829	308	1061	531	512
Dissolved Oxygen (% Saturation)	%	66.00	76.00	75.33	69.33	71.00

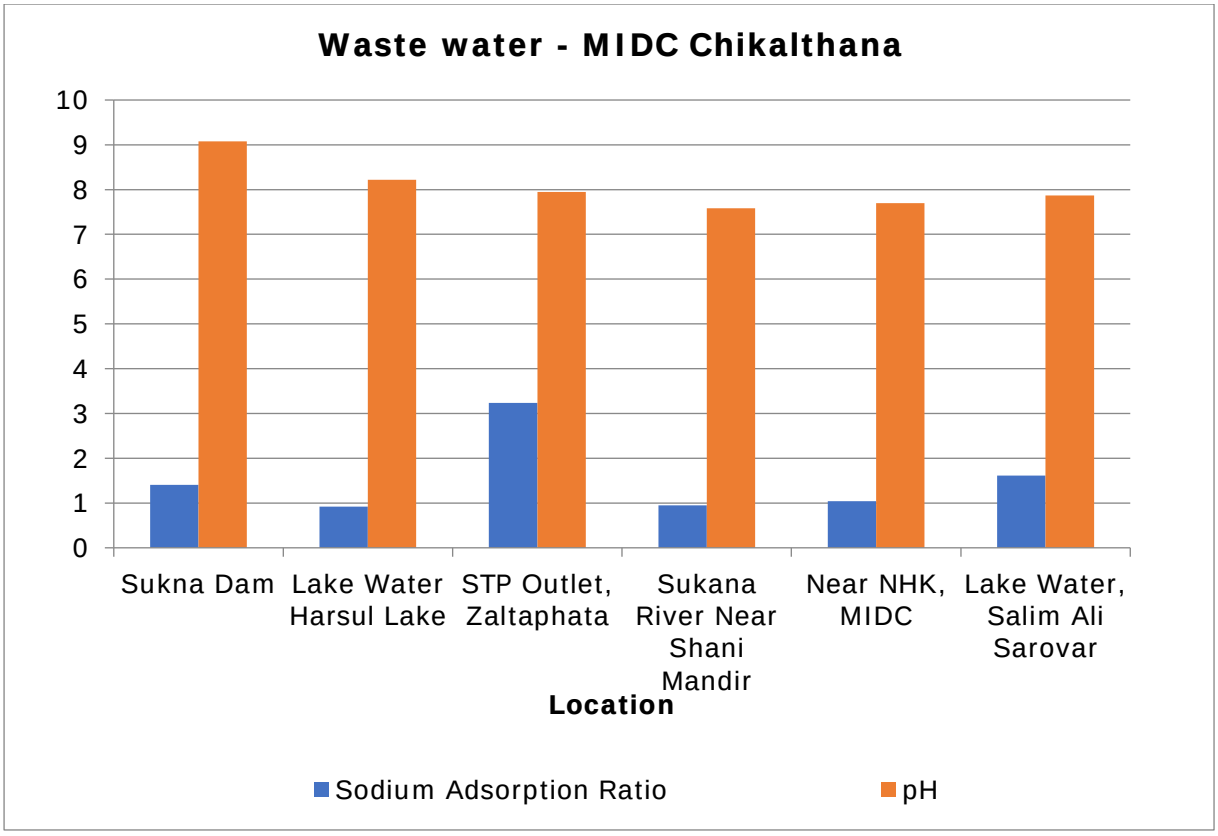
Parameters	Unit	Results				
		Sukna Dam	Lake Water Harsul Lake	STP Outlet Zalta Phata	Sukana River Near Shani Mandir	Lake Water, Salim Ali Sarovar
Chemical Oxygen Demand	mg/L	77	14	19	32	34
Biochemical Oxygen Demand (3 days,27°C)	mg/L	22	4	5	9	9
Electrical Conductivity (at 25 °C)	µmho/ cm	1481	550	1894	948	914
Nitrite Nitrogen (as NO_2)	mg/L	0.06	0.09	0.49	0.14	0.06
Nitrate Nitrogen (as NO_3)	mg/L	2.06	1.33	2.08	1.52	2.26
(NO_2 + NO_3)-Nitrogen	mg/L	2.08	1.36	2.56	1.56	2.28
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.15	BLQ	0.18	BLQ	0.10
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.13	0.57	1.70	0.87	0.83
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.10	0.10	1.00	1.30	0.15
Sodium Adsorption Ratio	-	1.40	0.92	3.24	0.95	1.62
Total Coliforms	MPN Index/ 100 ml	25	1600	693	1373	1600
Faecal Coliforms	MPN Index/ 100 ml	8	667	111	767	1373
Total Phosphate (as P)	mg/L	0.20	0.16	0.75	1.90	0.20
Total Kjeldahl Nitrogen (as N)	mg/L	3.02	0.74	1.16	2.73	6.23
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.26	0.19	0.17	0.41	0.38
Total Nitrogen	mg/L	17.52	2.08	3.72	4.29	8.52
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ

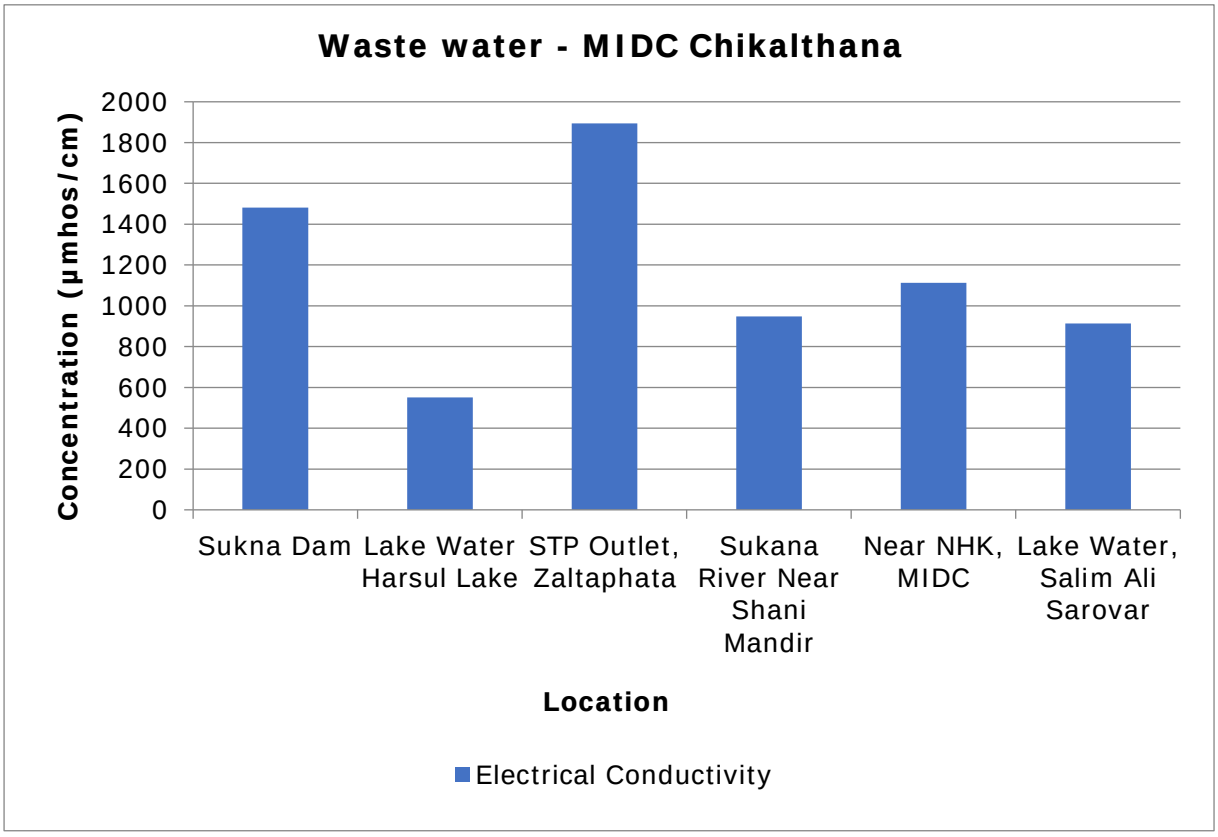
Parameters	Unit	Results				
		Sukna Dam	Lake Water Harsul Lake	STP Outlet Zalta Phata	Sukana River Near Shani Mandir	Lake Water, Salim Ali Sarovar
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	0.00	0.00	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	0.42	0.08	BLQ
Nickel (as Ni)	mg/L	BLQ	BLQ	0.01	0.01	BLQ
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ	0.05	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.01	0.01	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.04	0.08	0.04	0.51	0.06
Iron (as Fe)	mg/L	0.52	0.18	0.32	0.48	0.07
Vanadium (as V)	mg/L	0.05	0.05	0.15	0.03	0.03
Selenium (as Se)	mg/L	BLQ	0.01	0.01	BLQ	0.01
Boron (as B)	mg/L	0.21	0.30	0.31	0.17	0.19
Bioassay Test on fish	% survival	20	100	67	80	0

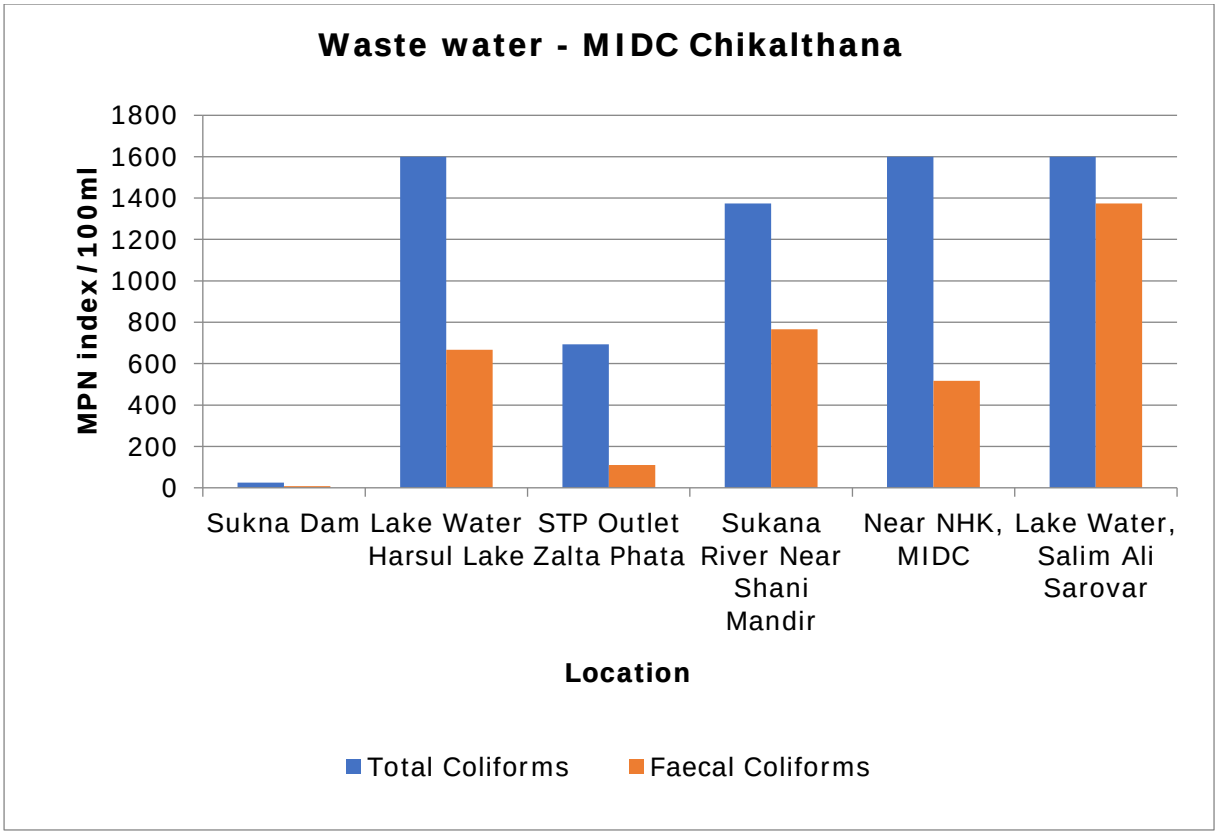
Graphs - Surface water of MIDC Chikalthana

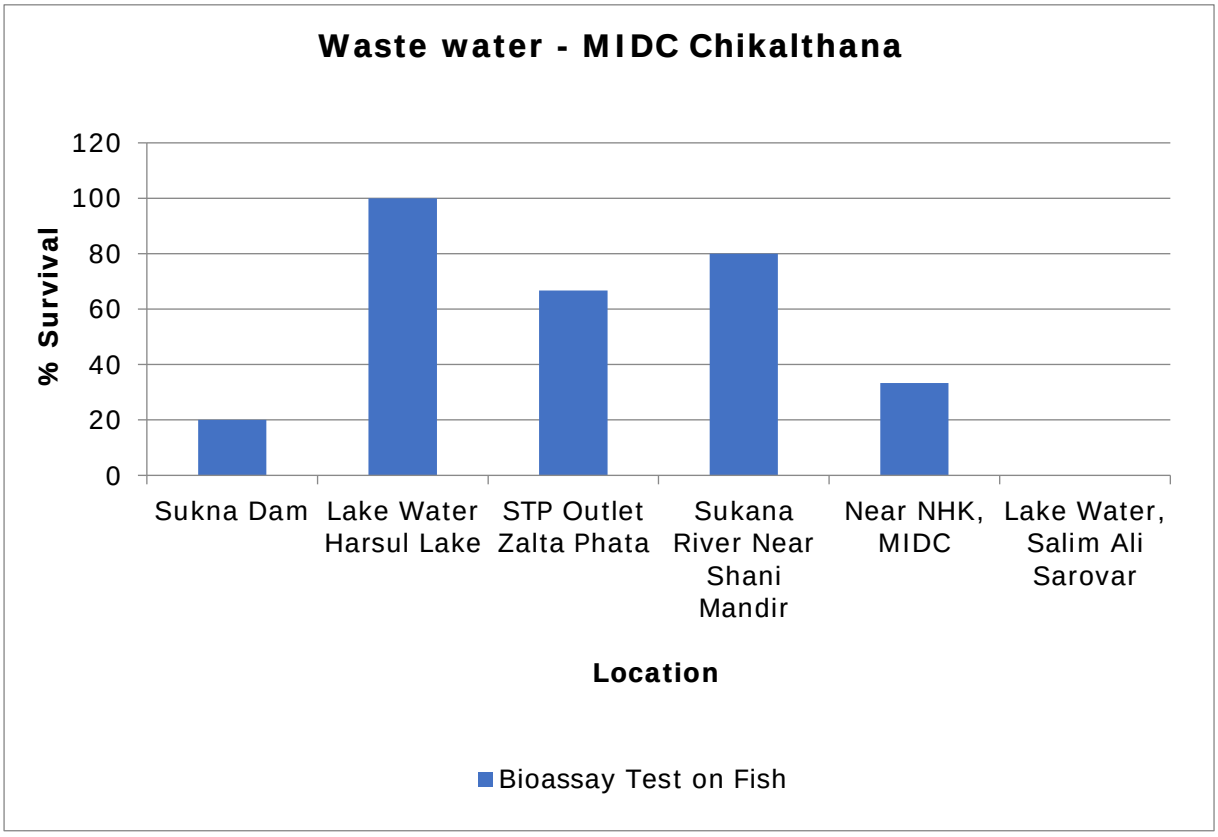





Waste water - MIDC Chikalthana
10
9
8
7
6
5
4
3
2
1
0
Sukna Dam
Lake Water Harsul Lake
STP Outlet, Zaltaphata
Sukana River Near Shani Mandir
Near NHK, MIDC
Lake Water, Salim Ali Sarovar
Location
Sodium Adsorption Ratio
pH


Waste water - MIDC Chikalthana
Concentration (µmhos/cm)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Sukna Dam
Lake Water Harsul Lake
STP Outlet, Zaltaphata
Sukana River Near Shani Mandir
Near NHK, MIDC
Lake Water, Salim Ali Sarovar
Location
Electrical Conductivity


Waste water - MIDC Chikalthana
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Sukna Dam
Lake Water Harsul Lake
STP Outlet Zalta Phata
Sukana River Near Shani Mandir
Near NHK, MIDC
Lake Water, Salim Ali Sarovar
Location
Total Coliforms
Faecal Coliforms


Waste water - MIDC Chikalthana
% Survival
120
100
80
60
40
20
0
Sukna Dam
Lake Water Harsul Lake
STP Outlet Zalta Phata
Sukana River Near Shani Mandir
Near NHK, MIDC
Lake Water, Salim Ali Sarovar
Location
Bioassay Test on Fish

3. **MIDC Waluj:** Six surface water samples were collected from MIDC Waluj.

- Water in Waluj MIDC was found relatively of poor quality as most of the parameters exceed the acceptable limits.
- All six water samples collected were seen with floating matter in general appearance. Parameters like colour and smell, both exceed the acceptable limits.
- Whereas, the general parameters like pH, electrical conductivity and suspended solids were observed well within the limits in all the samples.
- Concentration of Biological Oxygen Demand (BOD), and Total Kjeldahl Nitrogen (TKN) was found beyond the standard limits at all the studied locations except water sample of kham river.
- All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr^{6+}) etc. were also observed either below limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Nitrogen, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were also observed below the limit of quantification in all the studied samples.

Table 6.5 MIDC Waluj - Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Upstream Kham River Water	19.811217N	75.24969E	26.06.2024	28.06.2024	30.06.2024
2.	CETP Discharge Point	19.828454N	75.239718E	26.06.2024	28.06.2024	30.06.2024
3.	Lake Water, Behind K Sector	19.852431N	75.217922E	26.06.2024	28.06.2024	30.06.2024
4.	Lake Water, Jogeshwari	19.822524N	75.210661E	26.06.2024	28.06.2024	30.06.2024
5.	Pond Water, SMS CETP Waluj Pvt Ltd.	19.82869N	75.238967E	26.06.2024	28.06.2024	30.06.2024
6.	Lake Water Ghanegoan	19.865948N	75.212711E	26.06.2024	28.06.2024	30.06.2024

Fig: Geographical Locations of Surface Water Sampling MIDC Waluj

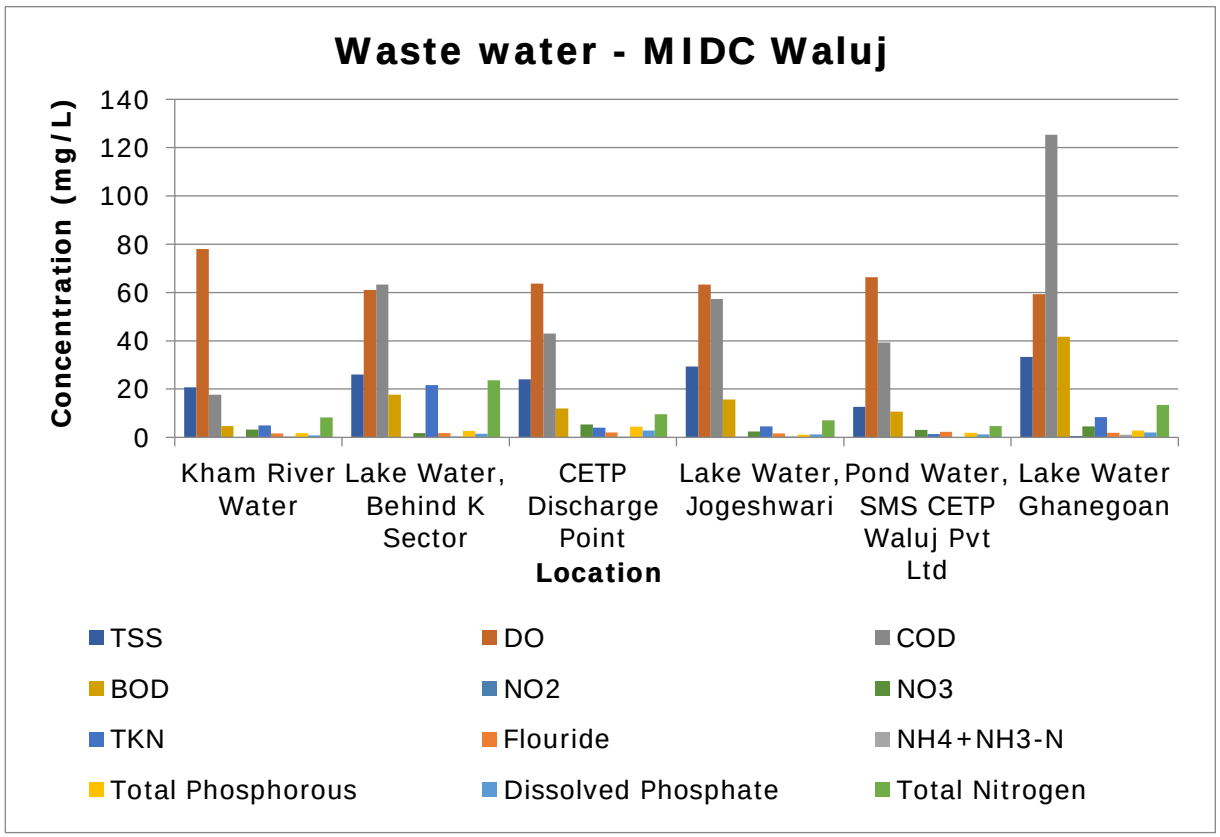
Table 6.6 MIDC Waluj - Results of Surface Water

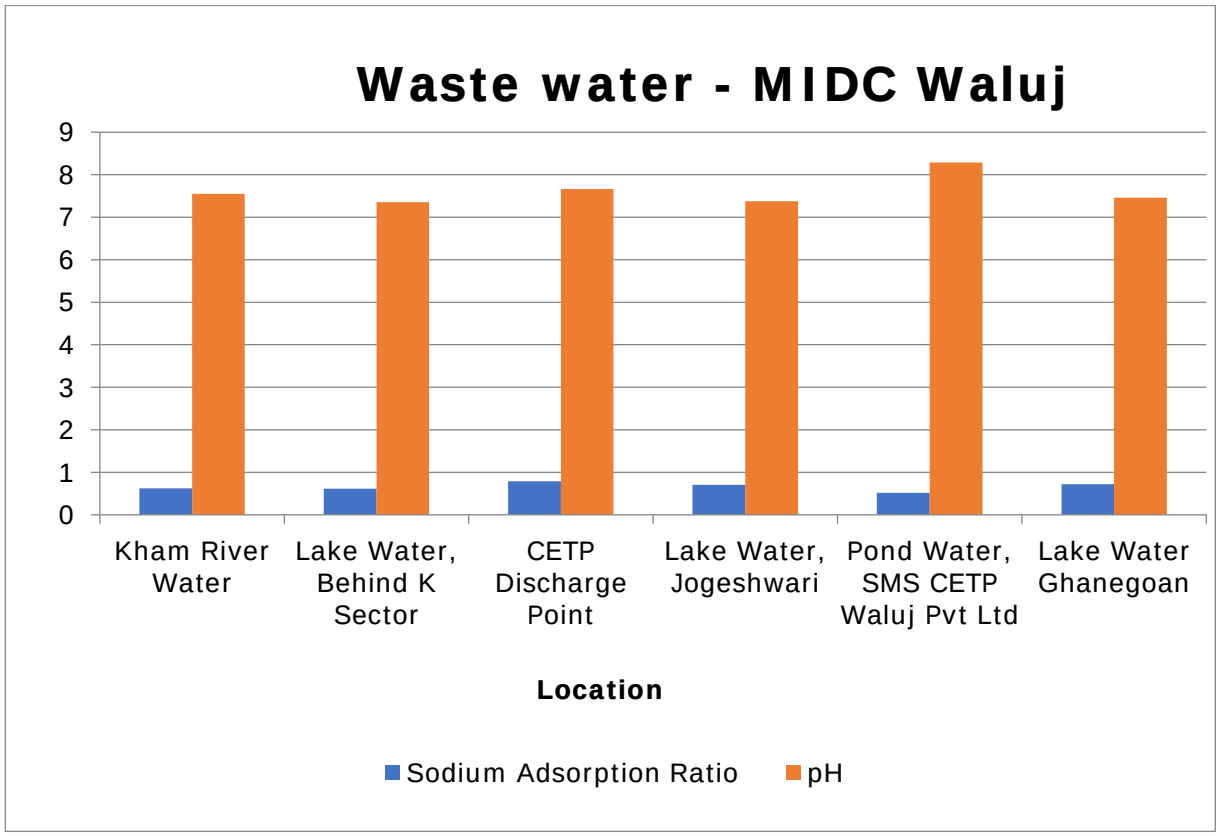
Parameters	Unit	Results					
		Kham River Water	Lake Water, Behind K Sector	CETP Discharge Point	Lake Water, Jogeshwari	Pond Water, SMS CETP Waluj Pvt Ltd	Lake Water Ghanegoan
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	Floating Matter evident	Floating Matter Evident	Floating Matter Evident	Floating Matter evident	Floating Matter evident	Floating Matter evident
Transparency	m	0.20	0.20	0.40	0.30	0.20	0.30
Temperature	^{o}C	32	32	32	31	31	31
Colour	Hazen	2	15	7	5	2	8
Smell	-	Not Agreeable	Agreeable	Not Agreeable	Not Agreeable	Agreeable	Agreeable
pH	-	7.55	7.35	7.66	7.38	8.29	7.46
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	20.67	26.00	24.00	29.33	12.67	33.33
Total Dissolved Solids	mg/L	1261	1239	2137	1207	2665	1227
Dissolved Oxygen (% Saturation)	%	78.00	61.00	63.67	63.33	66.33	59.33

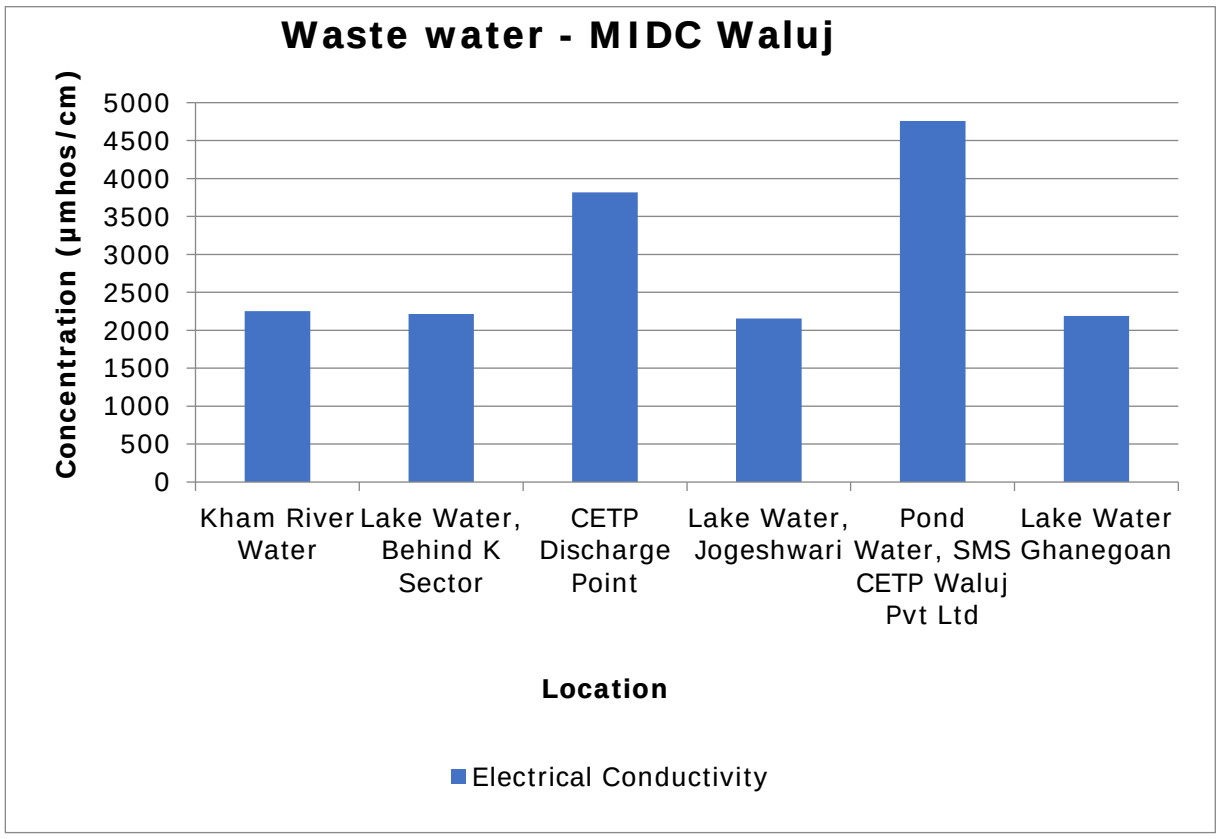
Parameters	Unit	Results					
		Kham River Water	Lake Water, Behind K Sector	CETP Discharge Point	Lake Water, Jogeshwari	Pond Water, SMS CETP Waluj Pvt Ltd	Lake Water Ghanegoan
Chemical Oxygen Demand	mg/L	18	63	43	57	39	125
Biochemical Oxygen Demand (3 days,27°C)	mg/L	5	18	12	16	11	42
Electrical Conductivity (at 25 °C)	µmho/cm	2253	2214	3817	2156	4760	2190
Nitrite Nitrogen (as NO_2)	mg/L	0.15	0.18	0.14	0.25	0.37	0.52
Nitrate Nitrogen (as NO_3)	mg/L	3.20	1.83	5.37	2.41	3.03	4.50
(NO_2 + NO_3)-Nitrogen	mg/L	3.29	1.89	5.51	2.57	3.28	5.02
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.60	1.80	2.03	1.63	2.23	1.90
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.80	1.47	2.79	1.23	1.20	2.07
Sodium Adsorption Ratio	-	0.62	0.61	0.79	0.71	0.52	0.72
Total Coliforms	MPN Index/100 ml	1183	1078	636	1183	17	630
Faecal Coliforms	MPN Index/100 ml	1123	554	570	130	4	376
Total Phosphate (as P)	mg/L	1.80	2.73	4.40	1.13	1.90	2.87
Total Kjeldahl Nitrogen (as N)	mg/L	4.91	21.72	4.07	4.52	1.42	8.41
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.44	0.38	0.34	0.44	0.16	1.06
Total Nitrogen	mg/L	8.22	23.60	9.59	7.09	4.70	13.43
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

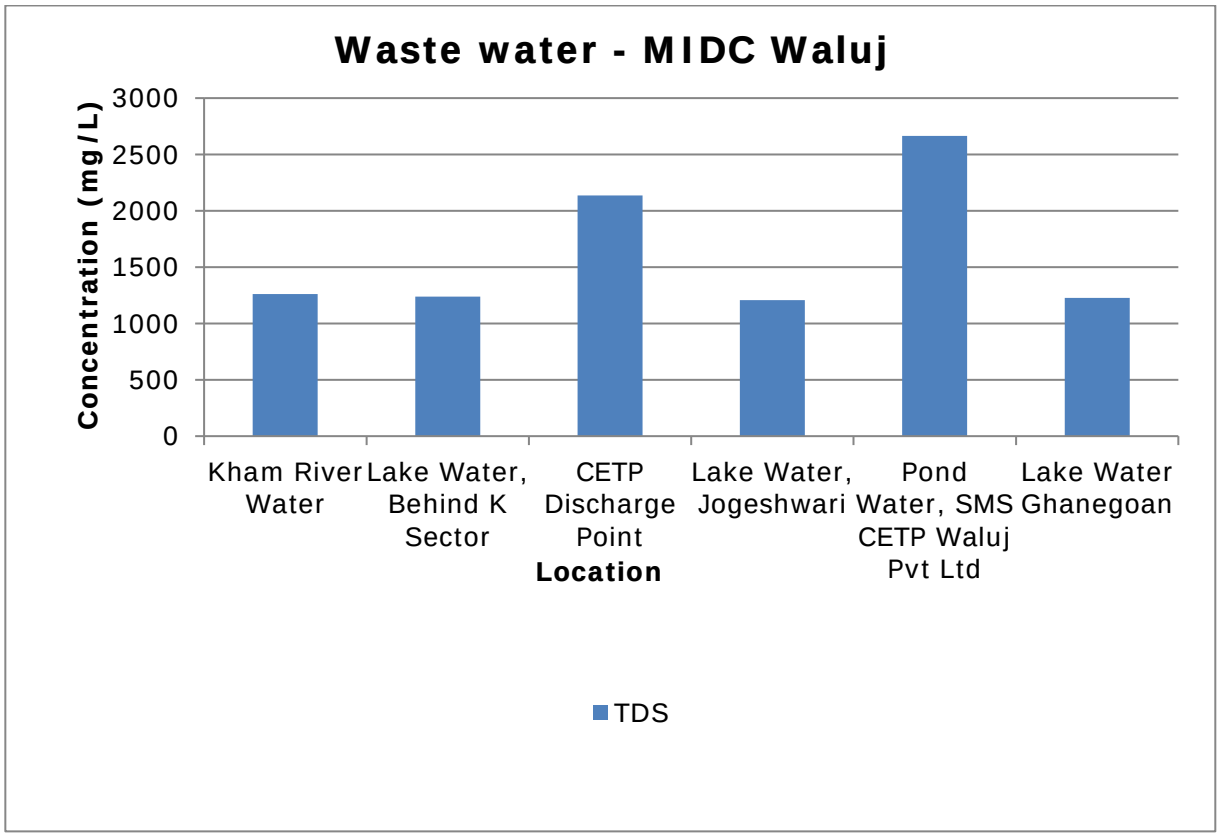
Parameters	Unit	Results					
		Kham River Water	Lake Water, Behind K Sector	CETP Discharge Point	Lake Water, Jogeshwari	Pond Water, SMS CETP Waluj Pvt Ltd	Lake Water Ghanegoan
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.09	BLQ	0.06	BLQ	BLQ	0.11
Nickel (as Ni)	mg/L	0.02	0.03	0.01	0.02	0.05	0.10
Copper (as Cu)	mg/L	BLQ	0.03	0.03	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	0.01	0.01	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.22	0.33	0.41	0.37	0.49	0.45
Iron (as Fe)	mg/L	0.30	0.11	0.23	0.13	0.12	0.30
Vanadium (as V)	mg/L	0.05	0.01	0.01	0.02	0.01	0.02
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ	0.01	0.01	0.01
Boron (as B)	mg/L	0.19	0.37	0.73	0.26	3.61	0.26
Bioassay Test on fish	% survival	47	27	47	53	33	13

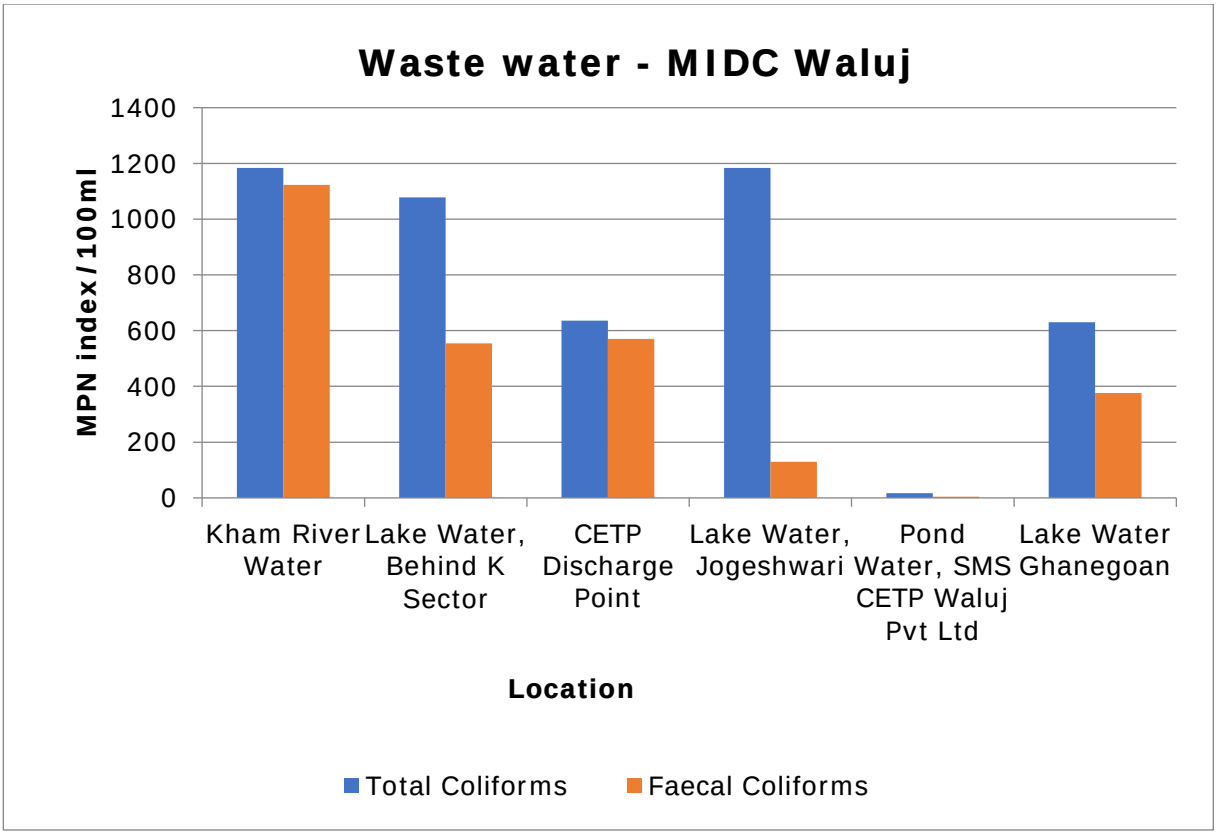
Graphs - Surface water of MIDC Waluj

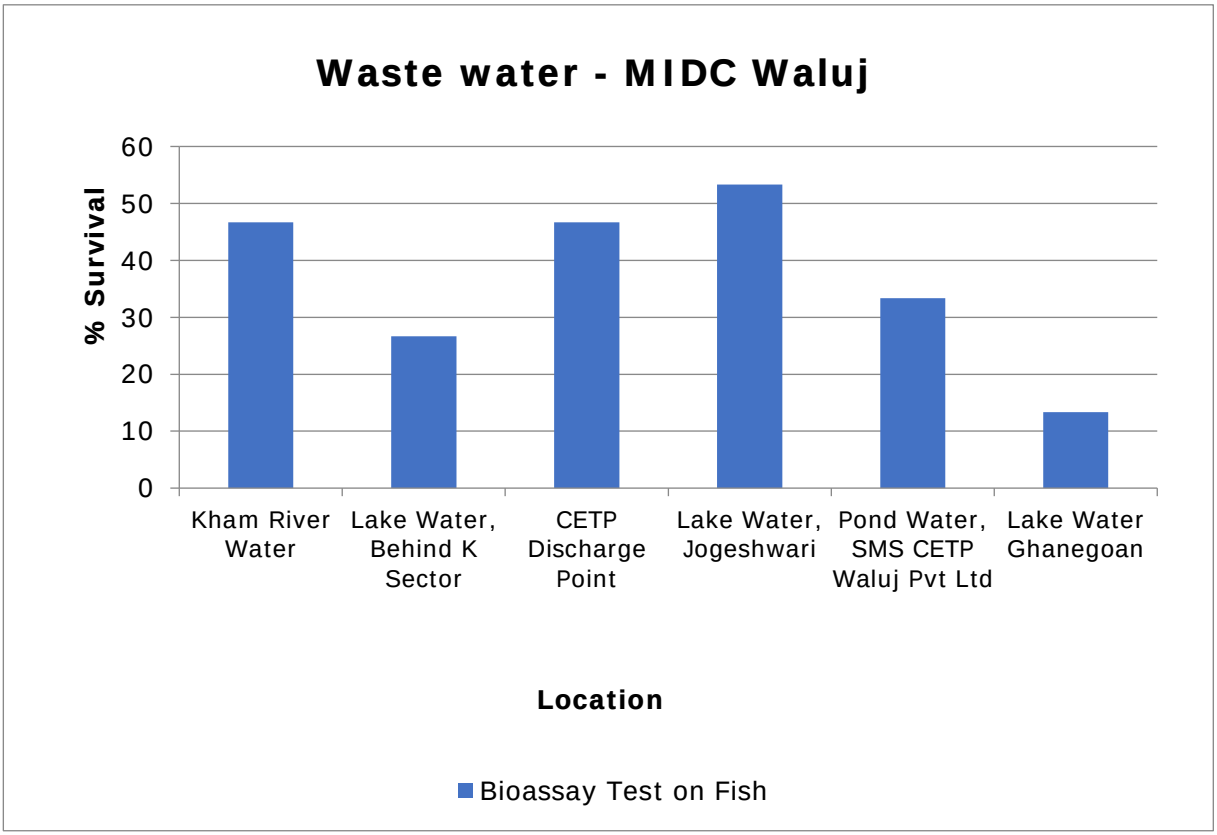





Waste water - MIDC Waluj
Concentration (µmhos/cm)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Kham River Water
Lake Water, Behind K Sector
CETP Discharge Point
Lake Water, Jogeshwari
Pond Water, SMS CETP Waluj Pvt Ltd
Lake Water Ghanegoan
Location
Electrical Conductivity


Waste water - MIDC Waluj
Concentration (mg/L)
3000
2500
2000
1500
1000
500
0
Kham River Water
Lake Water, Behind K Sector
CETP Discharge Point
Lake Water, Jogeshwari
Pond Water, SMS CETP Waluj Pvt Ltd
Lake Water Ghanegoan
Location
TDS


Waste water - MIDC Waluj
MPN index/100ml
1400
1200
1000
800
600
400
200
0
Kham River Water
Lake Water, Behind K Sector
CETP Discharge Point
Lake Water, Jogeshwari
Pond Water, SMS CETP Waluj Pvt Ltd
Lake Water Ghanegoan
Location
Total Coliforms
Faecal Coliforms


Waste water - MIDC Waluj
% Survival
60
50
40
30
20
10
0
Kham River Water
Lake Water, Behind K Sector
CETP Discharge Point
Lake Water, Jogeshwari
Pond Water, SMS CETP Waluj Pvt Ltd
Lake Water Ghanegoan
Location
Bioassay Test on Fish

4. **MIDC Paithan:** Six surface water samples were collected from MIDC Paithan.

- Out of six water samples, four samples were found acceptable in general appearance, colour, smell and transparency.
- General parameters like pH, electrical conductivity and suspended solids are also observed well within the limits in all the samples.
- The concentration of Biological Oxygen Demand (BOD) was found above the standard limits at all the studied locations.
- Fish survival was observed in the range of 13%-100% during fish bioassay.
- Metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. were also observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Nitrogen, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were also observed below the limit of quantification in all the studied samples.

Table 6.7 MIDC Paithan - Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Dam Water Back Side of WTP, Farolla Village, Paithan road	19.755413N	75.307286E	26.06.2024	28.06.2024	30.06.2024
2.	Nalla Water, Near Sharayu Seeds, Paithan Raod, ABD	19.78691N	75.278625E	26.06.2024	28.06.2024	30.06.2024
3.	Nalla Water Farolla Village, Paithan Road MIDC, ABD	19.727627N	75.295933E	26.06.2024	28.06.2024	30.06.2024
4.	Pond water Paithan Kheda, Khesapuri, MIDC Paithan Road A.bad	19.784947N	75.273555E	26.06.2024	28.06.2024	30.06.2024
5.	Nalla water, Near R. L. Steel, Chittegaon, Paithan road, ABD	19.742664N	75.293525E	26.06.2024	28.06.2024	30.06.2024
6.	Nalla Water, Near Itkheda, Station MIDC Paithan	19.846289N	75.299079E	26.06.2024	28.06.2024	30.06.2024

Fig: Geographical Locations of Surface Water Sampling MIDC Paithan

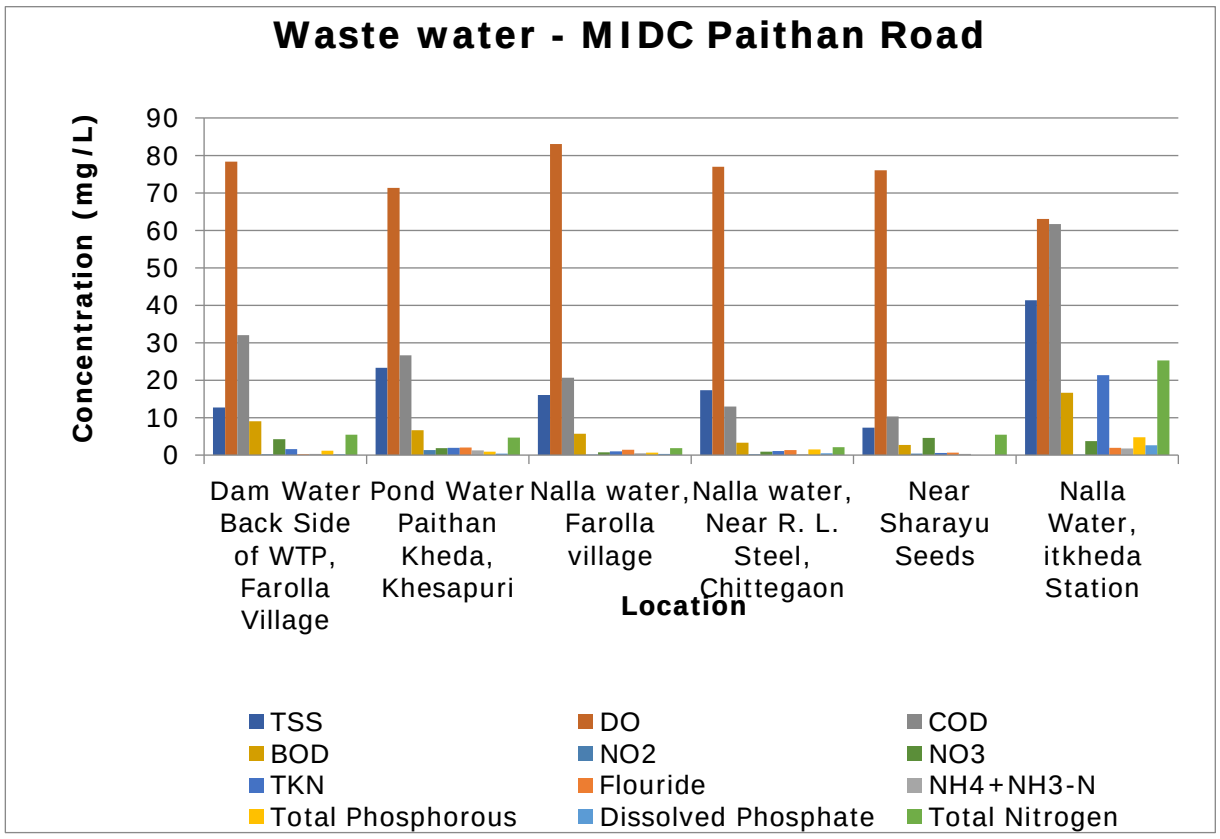
Table 6.8 MIDC Paithan - Results of Surface Water

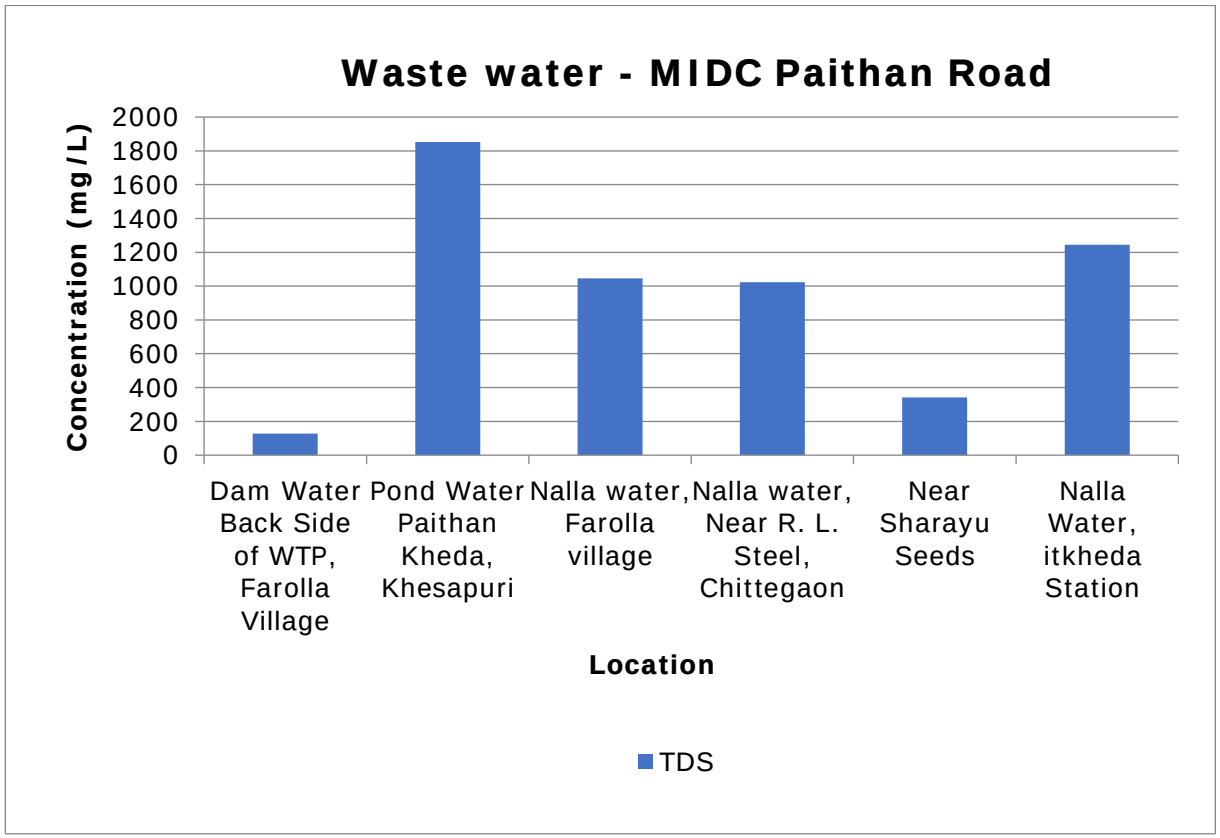
Parameters	Unit	Results					
		Dam Water Back Side of WTP	Pond Water Paithan Kheda, Khesapuri.	Nallah water, Farolla village	Nallah water, Near R. L. Steel	Near Sharayu Seeds, MIDC Paithan road,	Nallah Water, itkheda Station MIDC
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter evident	Floating Matter evident	Floating Matter evident	Floating Matter evident	Floating Matter evident
Transparency	m	0.50	0.30	0.20	0.20	0.10	0.10
Temperature	^{o}C	32	32	32	32	32	32
Colour	Hazen	1	2	1	1	1	18
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
pH	-	8.40	8.27	7.65	7.64	8.96	7.75
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	12.67	23.33	16.00	17.33	7.33	41.33
Total Dissolved Solids	mg/L	127	1852	1046	1024	342	1244
Dissolved Oxygen (% Saturation)	%	78.33	71.33	83.00	77.00	76.00	63.00

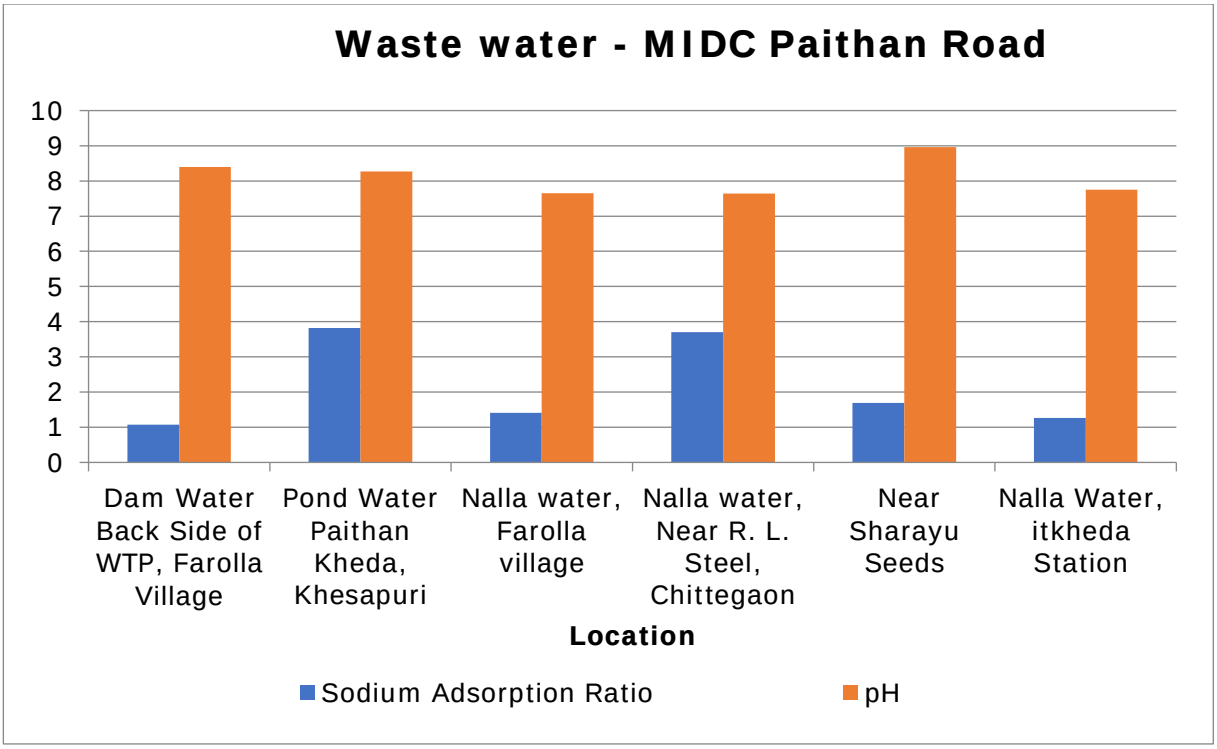
Parameters	Unit	Results					
		Dam Water Back Side of WTP	Pond Water Paithan Kheda, Khesapuri.	Nallah water, Farolla village	Nallah water, Near R. L. Steel	Near Sharayu Seeds, MIDC Paithan road,	Nallah Water, itkheda Station MIDC
Chemical Oxygen Demand	mg/L	32	27	21	13	10	62
Biochemical Oxygen Demand (3 days,27°C)	mg/L	9	7	6	3	3	17
Electrical Conductivity (at 25 °C)	µmho/ cm	228	3307	1867	1828	611	2221
Nitrite Nitrogen (as NO_2)	mg/L	0.20	1.31	0.12	0.21	0.36	0.16
Nitrate Nitrogen (as NO_3)	mg/L	4.23	1.84	0.77	0.88	4.63	3.72
(NO_2 + NO_3)-Nitrogen	mg/L	4.36	2.72	0.85	1.09	4.84	3.88
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.20	2.03	1.40	1.33	0.63	1.97
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.20	0.39	0.31	0.48	BLQ	2.59
Sodium Adsorption Ratio	-	1.07	3.82	1.41	3.70	1.69	1.27
Total Coliforms	MPN Index/ 100 ml	14	18	457	1600	13	1183
Faecal Coliforms	MPN Index/ 100 ml	5	13	65	1600	5	116
Total Phosphate (as P)	mg/L	1.20	0.89	0.64	1.50	BLQ	4.73
Total Kjeldahl Nitrogen (as N)	mg/L	1.57	1.94	1.01	1.05	0.56	21.34
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.28	1.26	0.46	0.20	0.32	1.80
Total Nitrogen	mg/L	5.42	4.66	1.86	2.14	5.42	25.23
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

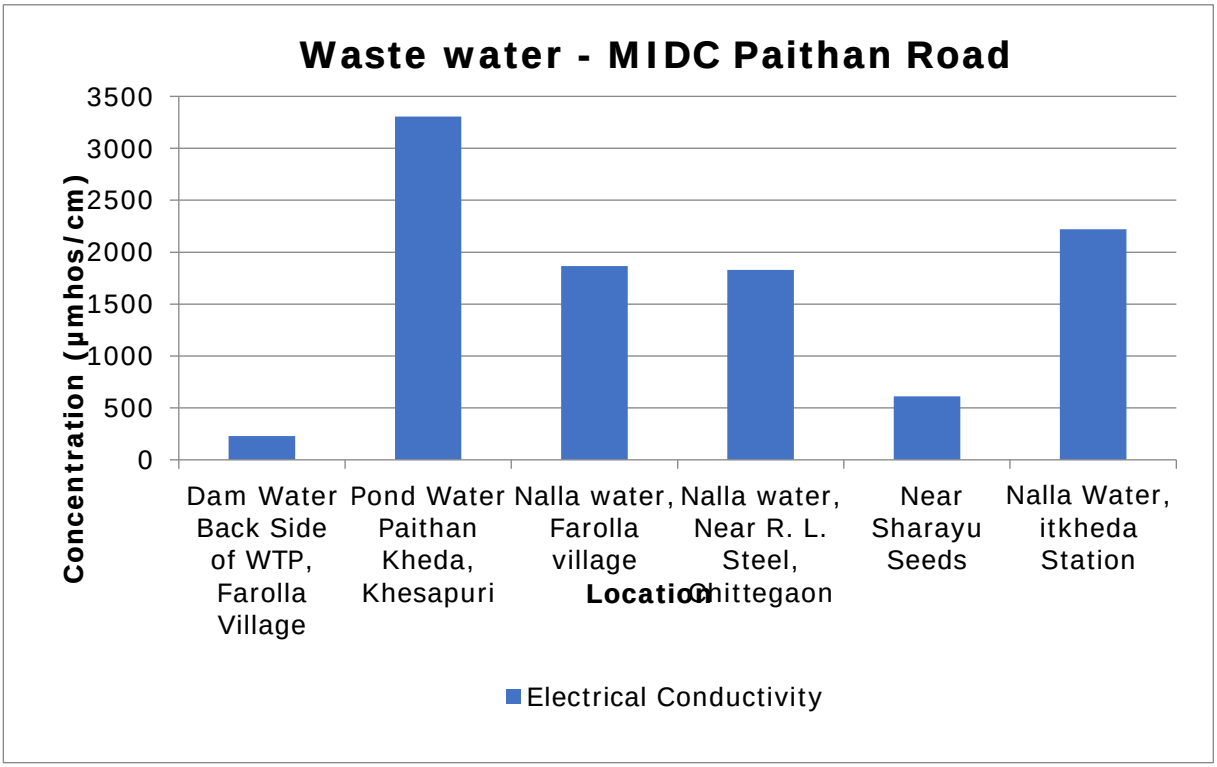
Parameters	Unit	Results					
		Dam Water Back Side of WTP	Pond Water Paithan Kheda, Khesapuri.	Nallah water, Farolla village	Nallah water, Near R. L. Steel	Near Sharayu Seeds, MIDC Paithan road,	Nallah Water, itkheda Station MIDC
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	0.00	BLQ	BLQ	BLQ	0.00
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.12	BLQ	0.07	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	0.02	0.02	0.01	0.02	0.01	0.02
Copper (as Cu)	mg/L	BLQ	BLQ	0.04	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.17	0.81	0.71	0.17	0.31	0.83
Iron (as Fe)	mg/L	1.50	0.13	1.49	0.13	0.46	0.14
Vanadium (as V)	mg/L	0.06	0.02	0.02	0.02	0.04	0.03
Selenium (as Se)	mg/L	BLQ	0.01	0.01	0.01	BLQ	BLQ
Boron (as B)	mg/L	0.13	BLQ	0.33	BLQ	0.27	0.50
Bioassay Test on fish	% survival	100	73	60	80	100	13

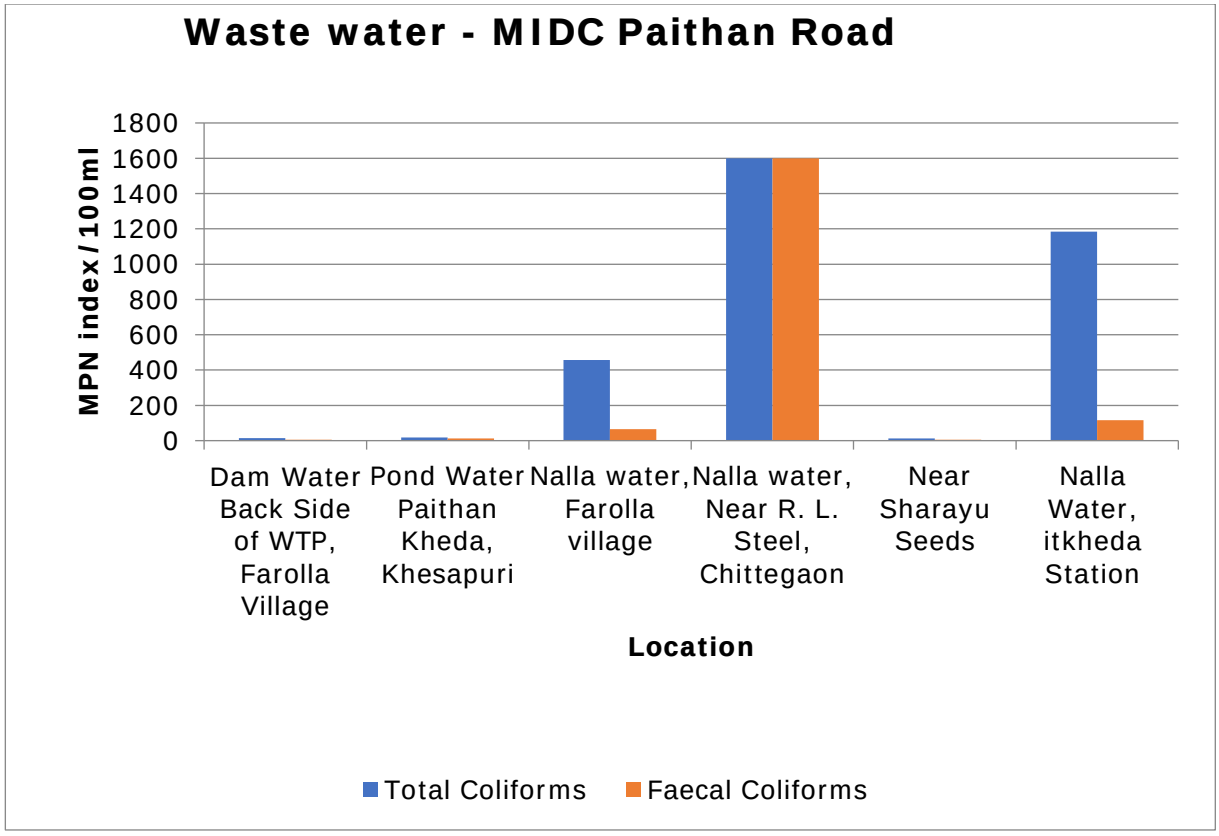
Graphs - Surface water of MIDC Paithan Road

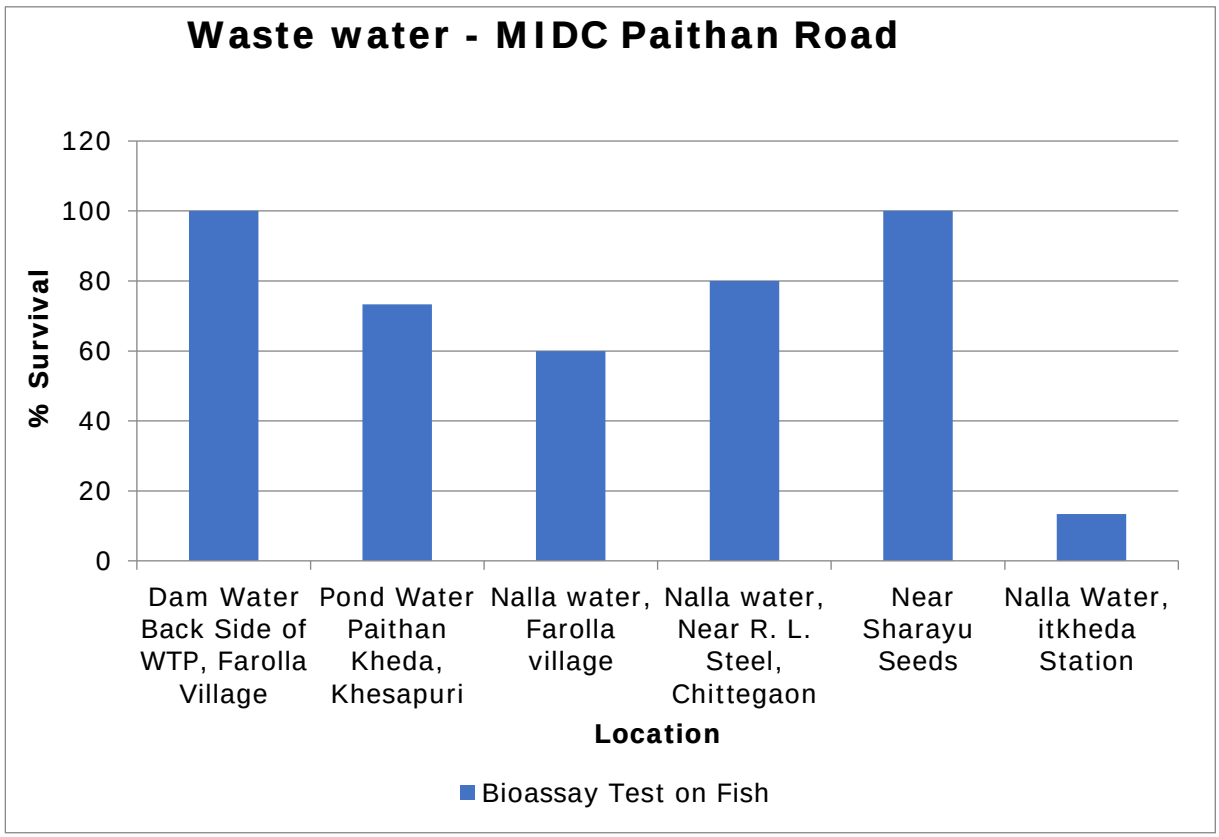





Waste water - MIDC Paithan Road
10
9
8
7
6
5
4
3
2
1
0
Dam Water Back Side of WTP, Farolla Village
Pond Water Paithan Kheda, Khesapuri
Nalla water, Farolla village
Nalla water, Near R. L. Steel, Chittegaon
Near Sharayu Seeds
Nalla Water, itkheda Station
Location
Sodium Adsorption Ratio
pH


Waste water - MIDC Paithan Road
Concentration (µmhos/cm)
3500
3000
2500
2000
1500
1000
500
0
Dam Water Back Side of WTP, Farolla Village
Pond Water Paithan Kheda, Khesapuri
Nalla water, Farolla village
Nalla water, Near R. L. Steel, Chittegaon
Near Sharayu Seeds
Nalla Water, itkheda Station
Location
Electrical Conductivity


Waste water - MIDC Paithan Road
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Dam Water Back Side of WTP, Farolla Village
Pond Water Paithan Kheda, Khesapuri
Nalla water, Farolla village
Nalla water, Near R. L. Steel, Chittegaon
Near Sharayu Seeds
Nalla Water, itkheda Station
Location
Total Coliforms
Faecal Coliforms


Waste water - MIDC Paithan Road
% Survival
120
100
80
60
40
20
0
Dam Water Back Side of WTP, Farolla Village
Pond Water Paithan Kheda, Khesapuri
Nalla water, Farolla village
Nalla water, Near R. L. Steel, Chittegaon
Near Sharayu Seeds
Nalla Water, itkheda Station
Location
Bioassay Test on Fish

6. Land Environment

For studying the land Environment of Aurangabad area, ground water was collected from Bore well. Dug well, and Hand Pump. A total of 12 samples were collected from MIDC Shendra, MIDC Chikalthana, MIDC Paithan and MIDC Waluj.

1. **MIDC Shendra:** Three groundwater samples were collected from the MIDC Aurangabad region.

- All three water samples collected were found acceptable in general appearance, colour, smell and transparency.
- All the general parameters like pH, suspended solids, BOD, and COD are also well within the limits in two samples collected.
- Electrical conductivity of open well in shendra village was highest with 3540 µmhos/cm.
- Fish survival was achieved in the range of 73% to 90% in the water samples during the Fish Bioassay.
- All metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr6+) etc. were observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds also met the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were determined below the limit of quantification in all 3 samples collected.
- Organo Chlorine Pesticides were also observed below the limit of quantification in all 3 samples collected.

Table 7.1 MIDC Shendra - Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Open Well Wockhardt Shendra	19.874387	75.49215	25.06.2024	27.06.2024	29.06.2024
2.	Hand Pump, Near Grampanchayat, Kumbhephal Village	19.861724	75.493492	25.06.2024	27.06.2024	29.06.2024
3.	Hand Pump, Near Hanuman Temple, Shendra Village	19.872872	75.470608	25.06.2024	27.06.2024	29.06.2024

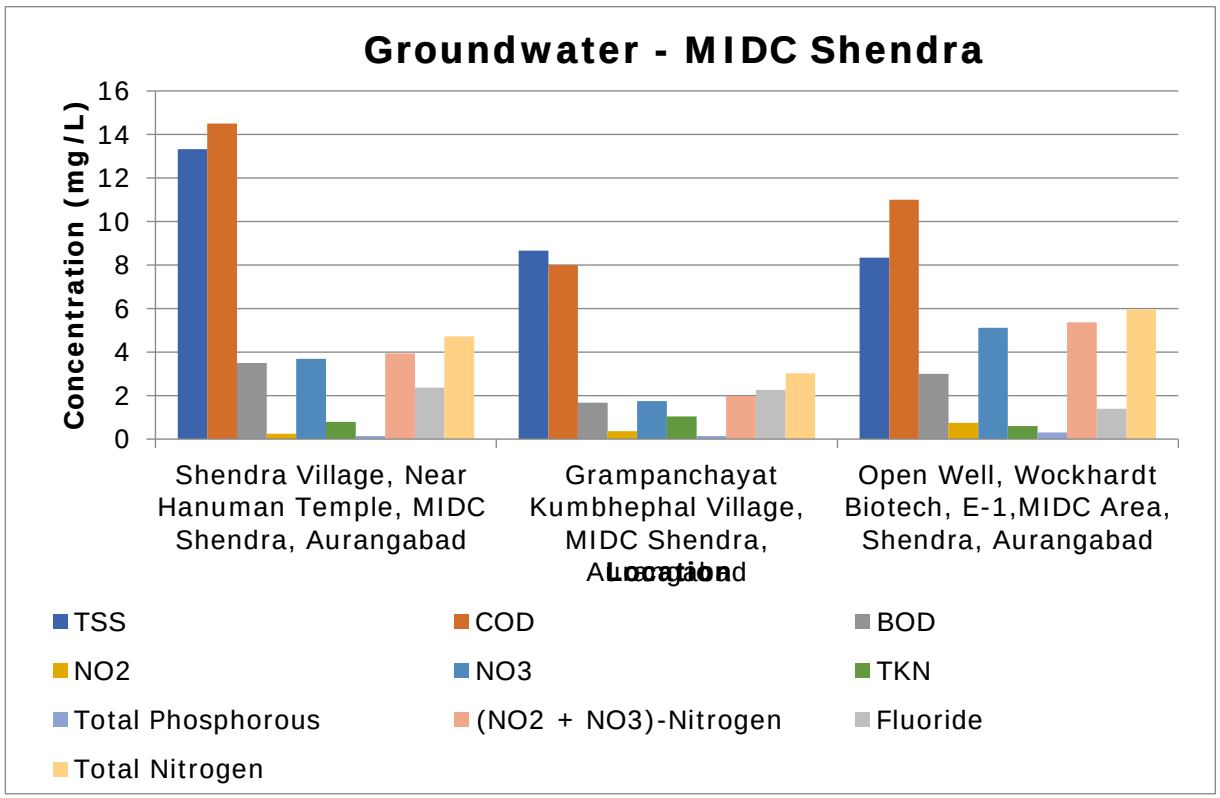
Fig: Geographical Locations of Ground Water Sampling MIDC Shendra

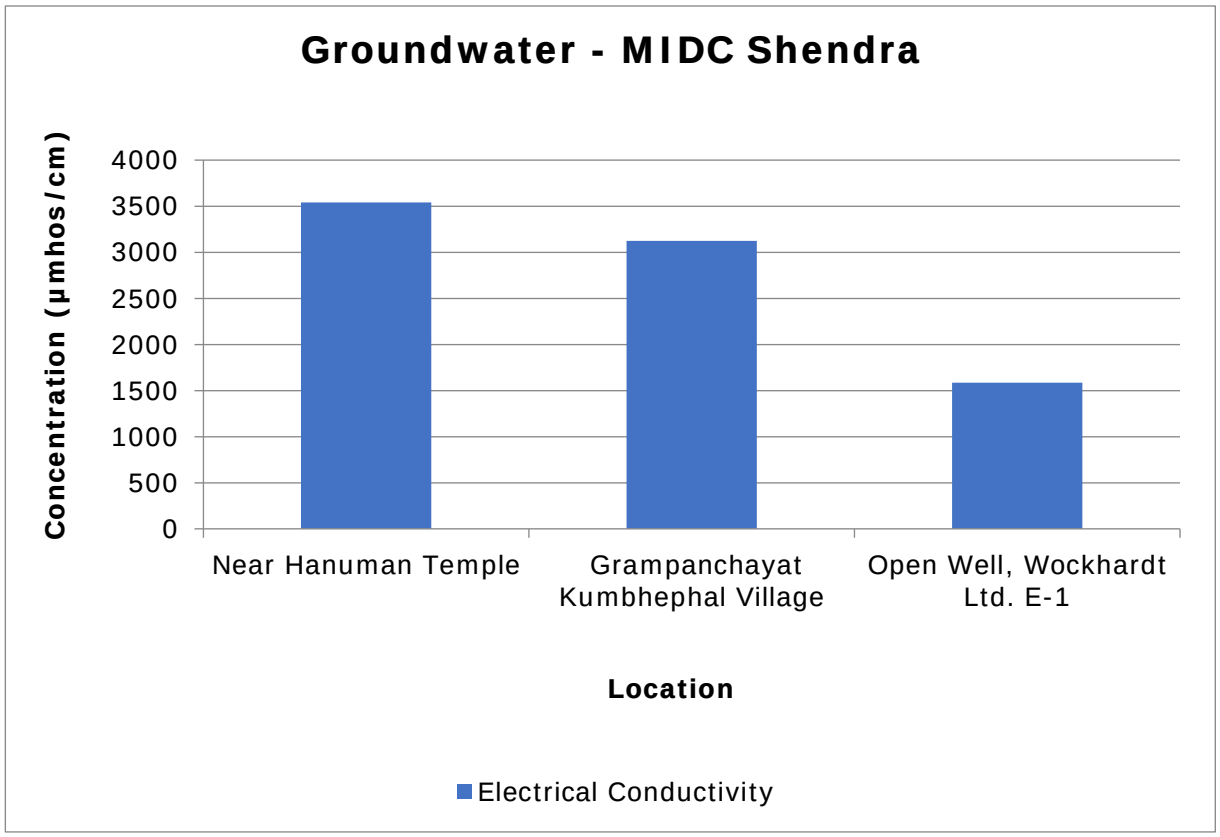
Table 7.2 MIDC Shendra - Results of Ground Water

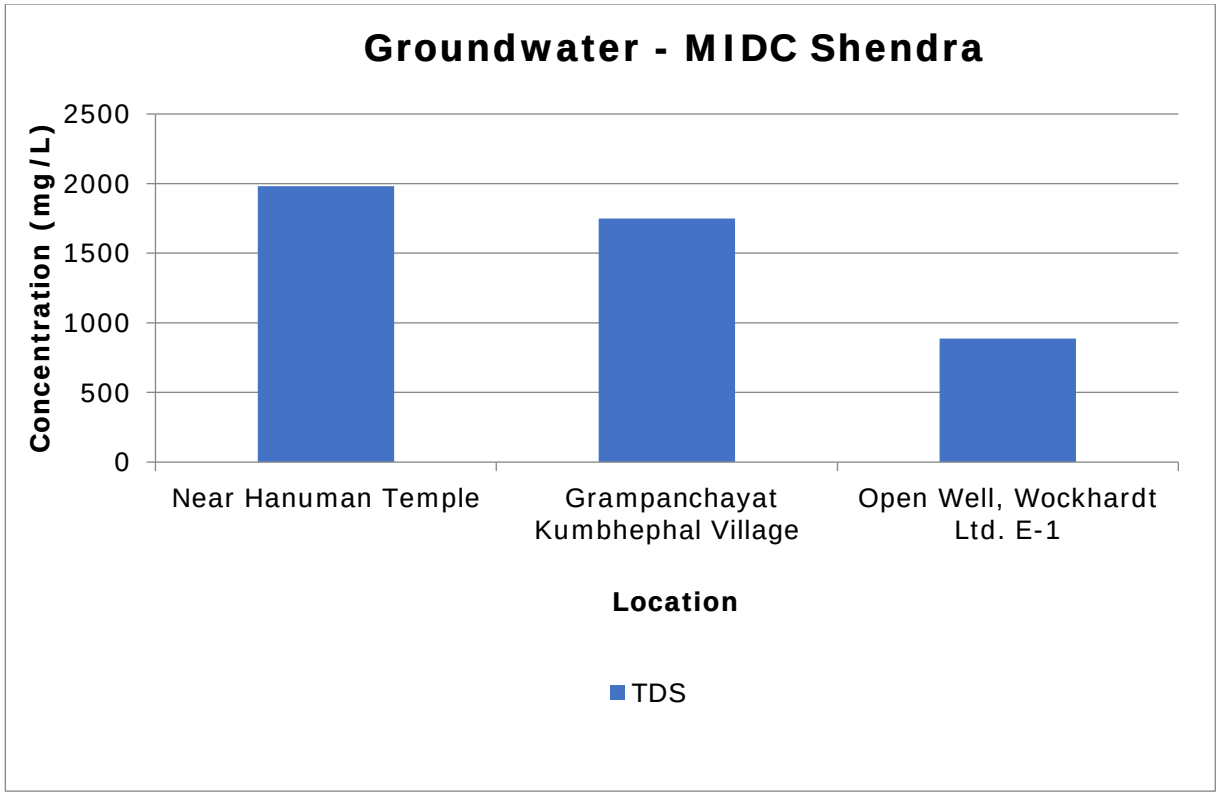
Parameters	Unit	Results		
		Hanuman Temple Shendra Village	Hand Pump Near Grampanchayat Kumbhephal Village	Open Well, Wockhardt Ltd. E-1, MIDC Area
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	No floating matter	No floating matter	No Floating matter
Transparency	m	NA	NA	1.5
Temperature	Hazen	28	28	28
Colour	^{o}C	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.23	7.03	7.51
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	13.33	8.67	8.33
Total Dissolved Solids	mg/L	1982	1749	887
Chemical Oxygen Demand	mg/L	15	8	11
Biochemical Oxygen Demand (3 days,27^{o}C)	mg/L	4	2	3
Electrical Conductivity (at 25^{o}C)	µmho/cm	3540	3123	1584
Nitrite Nitrogen (as NO_2)	mg/L	0.24	0.36	0.75
Nitrate Nitrogen (as NO_3)	mg/L	3.69	1.74	5.11
(NO_2 + NO_3)-Nitrogen	mg/L	3.93	1.98	5.36
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.02	0.02	0.15

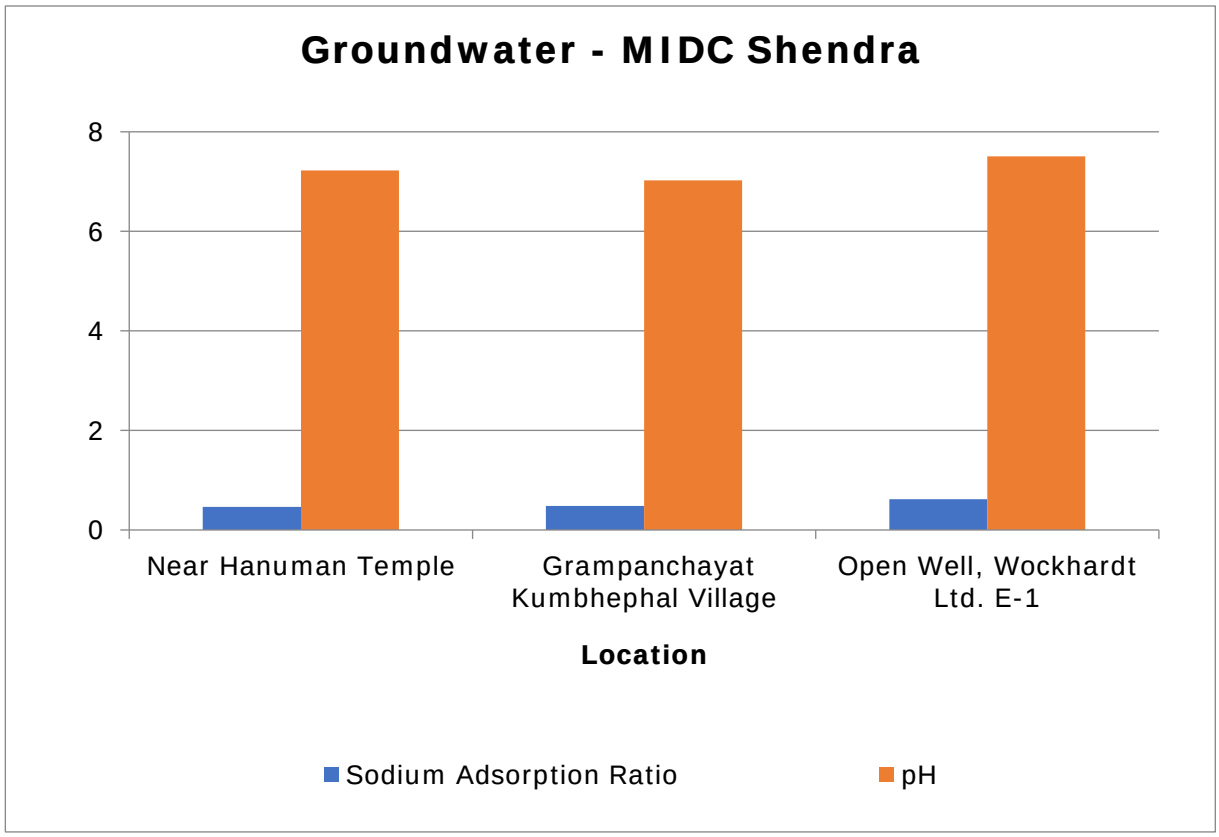
Parameters	Unit	Results		
		Hanuman Temple Shendra Village	Hand Pump Near Grampanchayat Kumbhephal Village	Open Well, Wockhardt Ltd. E-1, MIDC Area
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	2.37	2.27	1.4
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	BLQ	BLQ
Sodium Adsorption Ratio	-	0.465	0.48	0.62
Total Coliforms	MPN Index /100 mL	1600	20	853
Faecal Coliforms	MPN Index /100 mL	247	5	372
Total Phosphate (as P)	mg/L	0.14	0.14	0.3
Total Kjeldahl Nitrogen (as N)	mg/L	0.78	1.04	0.60
Total Ammonia (NH4+NH3)-Nitrogen)	mg/L	0.27	0.13	0.13
Total Nitrogen	mg/L	4.72	3.03	5.96
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.089	0.3165	0.08
Nickel (as Ni)	mg/L	0.014	0.012	BLQ
Copper (as Cu)	mg/L	0.024	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.014	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.04	0.16	0.07
Iron (as Fe)	mg/L	0.74	0.41	0.90
Vanadium (as V)	mg/L	0.02	0.04	0.01
Selenium (as Se)	mg/L	0.01	0.01	BLQ
Boron (as B)	mg/L	0.23	0.43	0.27
Bioassay Test on fish	% survival	73	80	93

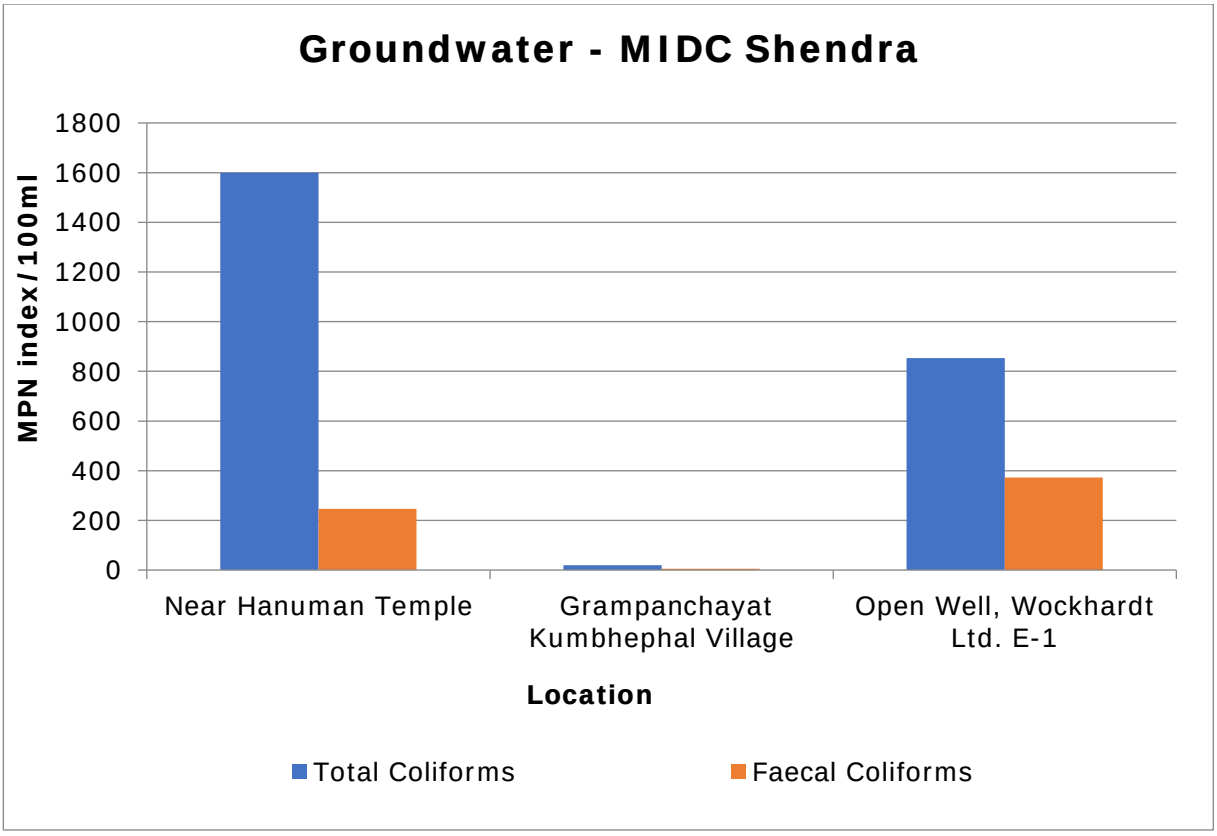
Graphs - Ground Water of MIDC Aurangabad

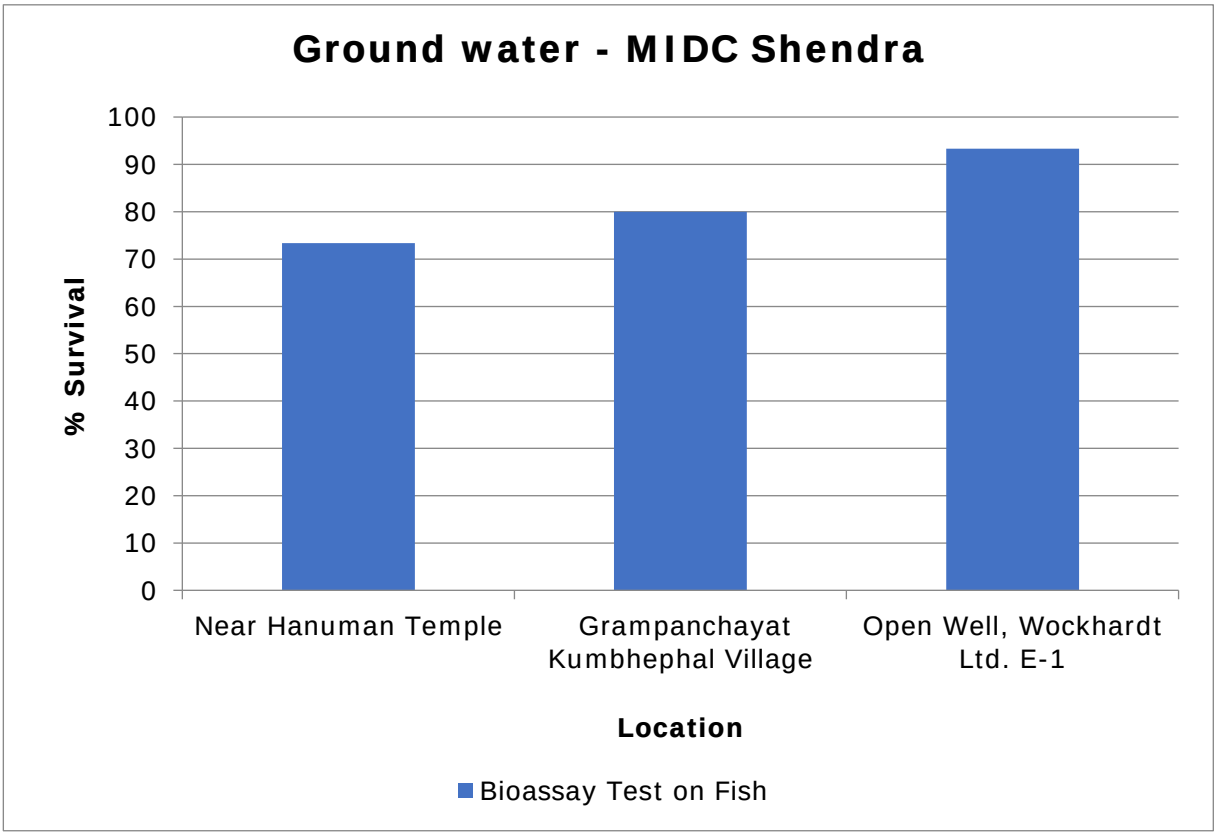





Groundwater - MIDC Shendra
Concentration (mg/L)
2500
2000
1500
1000
500
0
Near Hanuman Temple
Grampanchayat Kumbhephal Village
Open Well, Wockhardt Ltd. E-1
Location
TDS


Groundwater - MIDC Shendra
8
6
4
2
0
Near Hanuman Temple
Grampanchayat Kumbhephal Village
Open Well, Wockhardt Ltd. E-1
Location
Sodium Adsorption Ratio
pH


Groundwater - MIDC Shendra
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Near Hanuman Temple
Grampanchayat Kumbhephal Village
Open Well, Wockhardt Ltd. E-1
Location
Total Coliforms
Faecal Coliforms


Ground water - MIDC Shendra
% Survival
100
90
80
70
60
50
40
30
20
10
0
Near Hanuman Temple
Grampanchayat Kumbhephal Village
Open Well, Wockhardt Ltd. E-1
Location
Bioassay Test on Fish

2. **MIDC Chikalthana:** From MIDC Chikalthana also, three ground water samples were collected.

- All three water samples collected were found acceptable in colour, smell and transparency.
- Concentration of pH, suspended solids, BOD, and COD were also well within the limits at all three samples collected.
- Electrical conductivity of borewell in dahihande wasti was observed as 3680 within acceptable limits.
- 100% survival was achieved in all three water samples during the Fish Bioassay.
- Metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. were also observed either below the limit of quantification (BLQ) or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were below the limit of quantification (BLQ) in all 3 samples collected.
- Organo Chlorine Pesticides were also below the limit of quantification in all 3 samples collected.

Table 7.3 MIDC Chikalthana - Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Borewell at RD Bhalerao HADCO Corner	19.911462	75.349547	25.06.2024	27.06.2024	29.06.2024
2.	Bore Well, Dahihande Wasti, MIDC Chikalthana	19.896011	75.364386	25.06.2024	27.06.2024	29.06.2024
3.	Bore Well, B B Solanke, Manik nagar, Naregaon, Chikalthana, Aurangabad.	19.894554	75.383331	25.06.2024	27.06.2024	29.06.2024

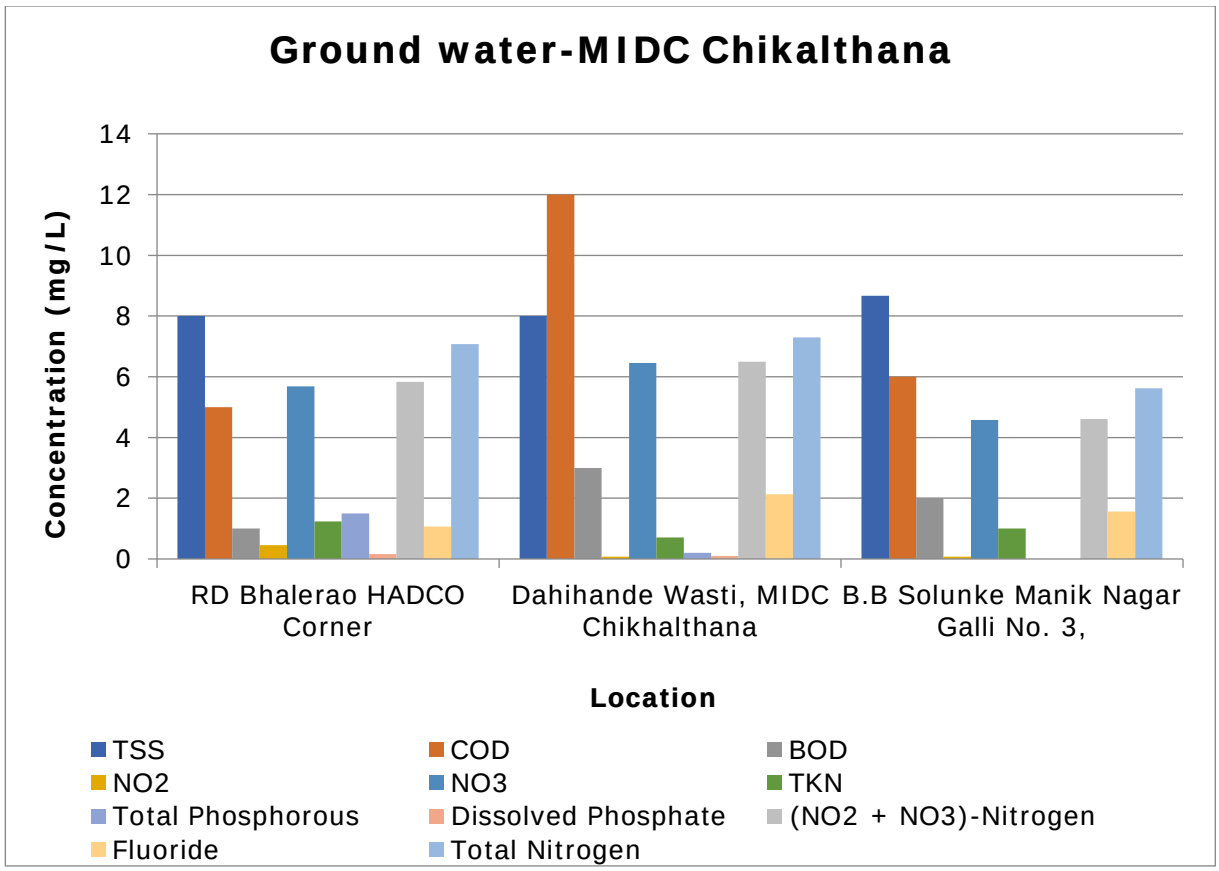
Fig: Geographical Locations of Ground Water Sampling MIDC Chikalthana

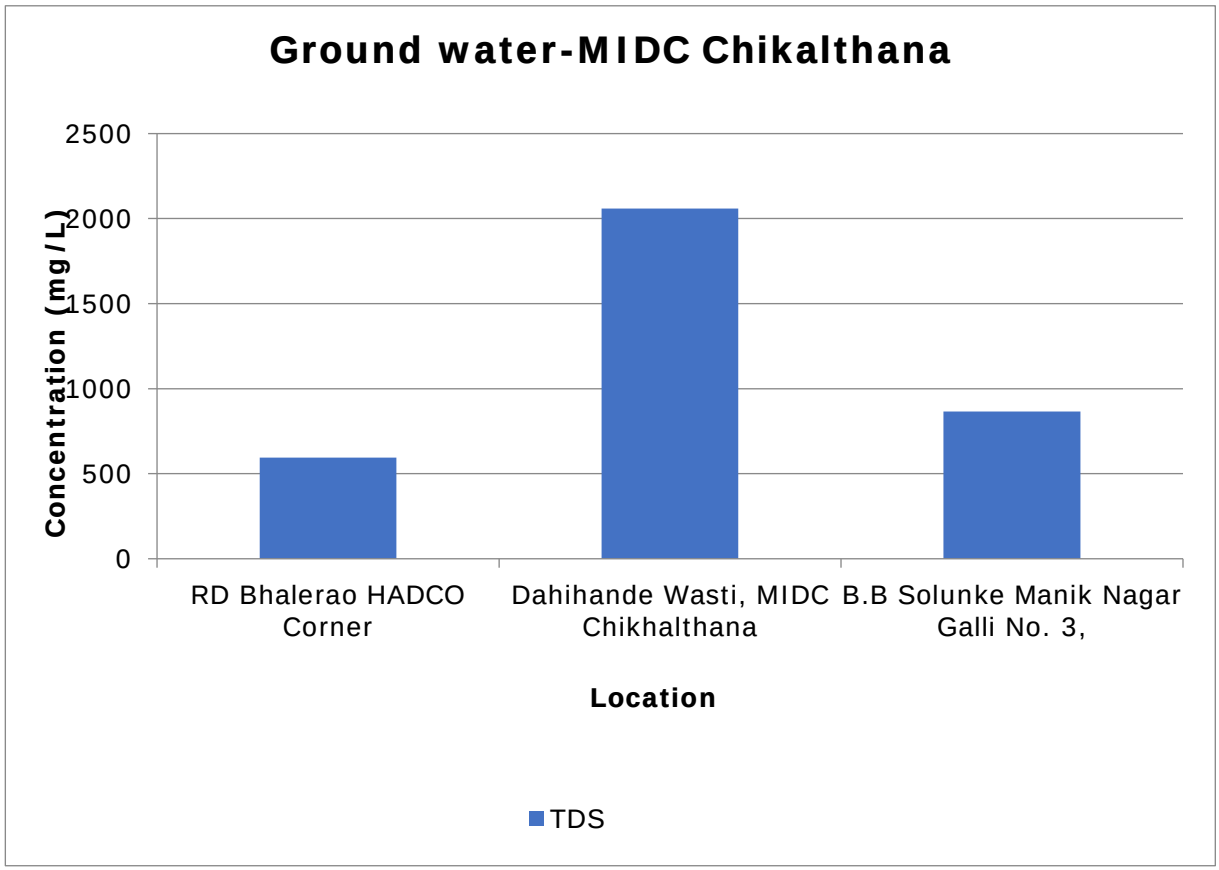
Table 7.4 MIDC Chikalthana - Results of Ground Water

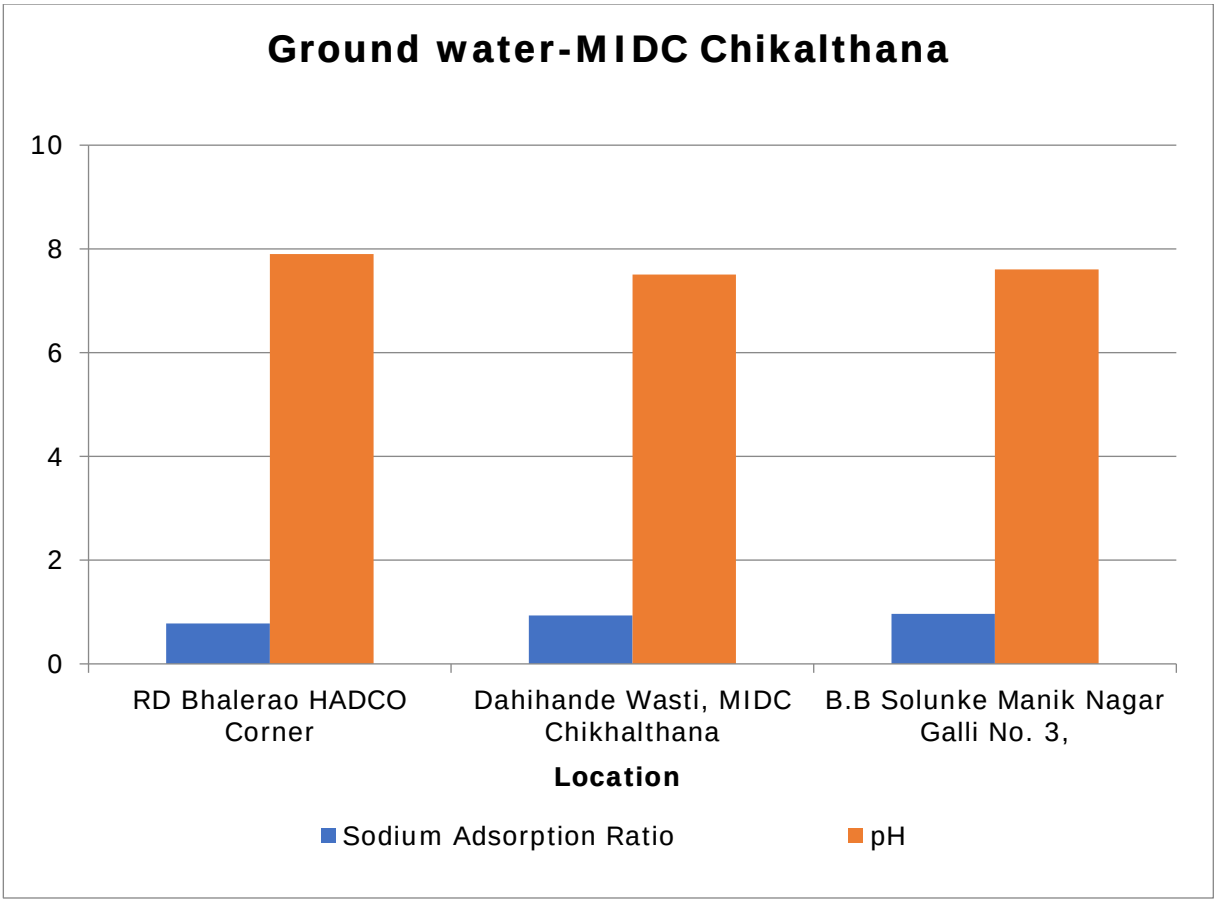
Parameters	Unit	Results		
		RD Bhalerao HADCO Corner	Dahihande Wasti, MIDC Chikhalthana	B.B Solunke Manik Nagar Galli No. 3, Naregaon Chikaltahna
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	floating matter Evident	floating matter Evident	floating matter Evident
Transparency	m	NA	NA	NA
Temperature	Hazen	28	28	28
Colour	^oC	1	1	1.33
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.9	7.51	7.61
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	8.00	8.00	8.67
Total Dissolved Solids	mg/L	595	2060	865
Chemical Oxygen Demand	mg/L	5	12	6
Biochemical Oxygen Demand (3 days,27^oC)	mg/L	1	3	2
Electrical Conductivity (at 25^oC)	µmho/cm	1064	3680	1546
Nitrite Nitrogen (as NO_2)	mg/L	0.45	0.08	0.08
Nitrate Nitrogen (as NO_3)	mg/L	5.68	6.455	4.58
(NO_2 + NO_3)-Nitrogen	mg/L	5.83	6.495	4.60
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.15	BLQ	BLQ

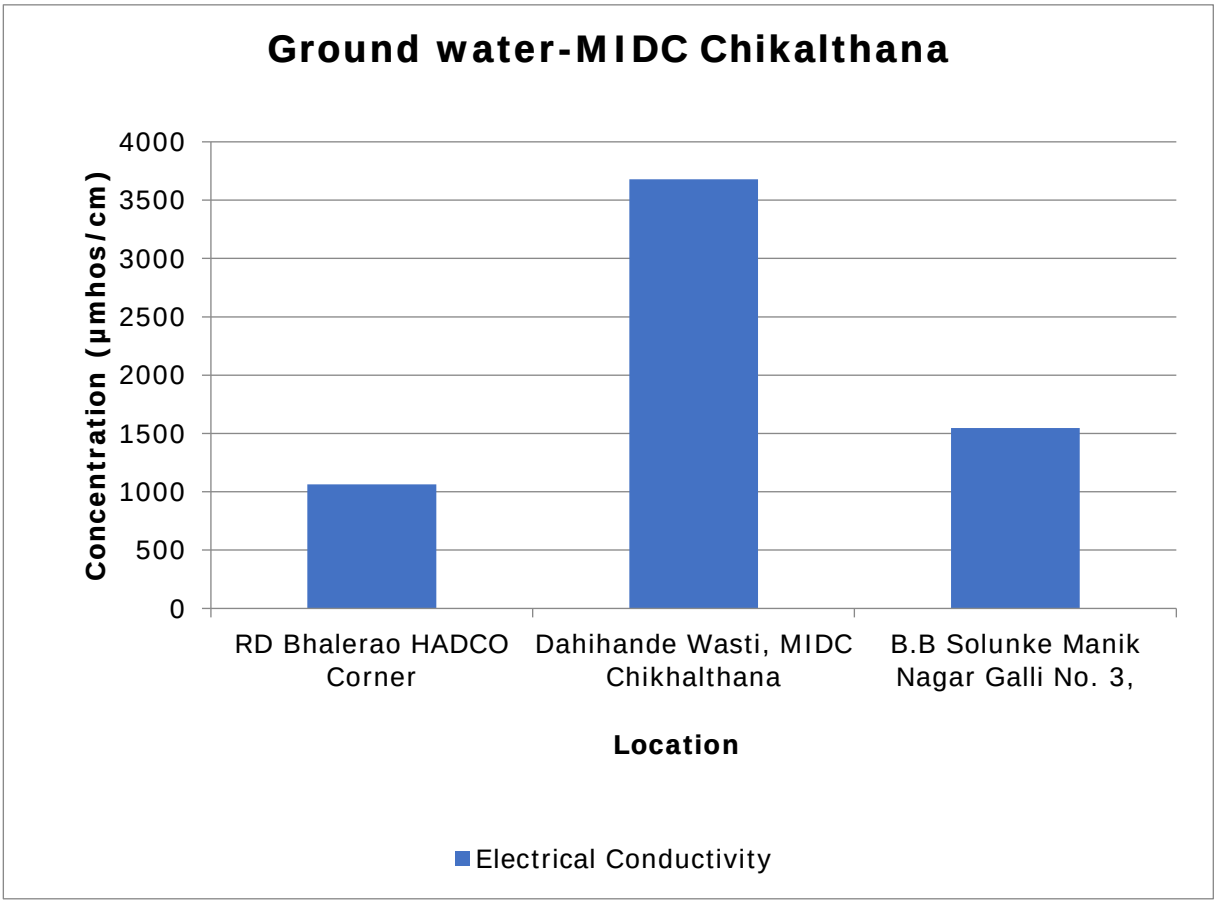
Parameters	Unit	Results		
		RD Bhalerao HADCO Corner	Dahihande Wasti, MIDC Chikhalthana	B.B Solunke Manik Nagar Galli No. 3, Naregaon Chikaltahna
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.07	2.13	1.57
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.16	0.1	BLQ
Sodium Adsorption Ratio	-	0.78	0.935	0.97
Total Coliforms	MPN Index /100 mL	47	111	1600
Faecal Coliforms	MPN Index /100 mL	2	85	743
Total Phosphate (as P)	mg/L	1.5	0.2	BLQ
Total Kjeldahl Nitrogen (as N)	mg/L	1.23	0.71	1.01
Total Ammonia (NH4+NH3)-Nitrogen)	mg/L	BLQ	0.13	0.13
Total Nitrogen	mg/L	7.07	7.3	5.62
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	0.06
Nickel (as Ni)	mg/L	BLQ	BLQ	BLQ
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.01	BLQ	0.01
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	BLQ	0.03	BLQ
Iron (as Fe)	mg/L	0.64	0.24	0.20
Vanadium (as V)	mg/L	0.04	0.06	0.09
Selenium (as Se)	mg/L	0.01	0.01	0.01
Boron (as B)	mg/L	0.43	0.50	0.36
Bioassay Test on fish	% survival	100	100	100

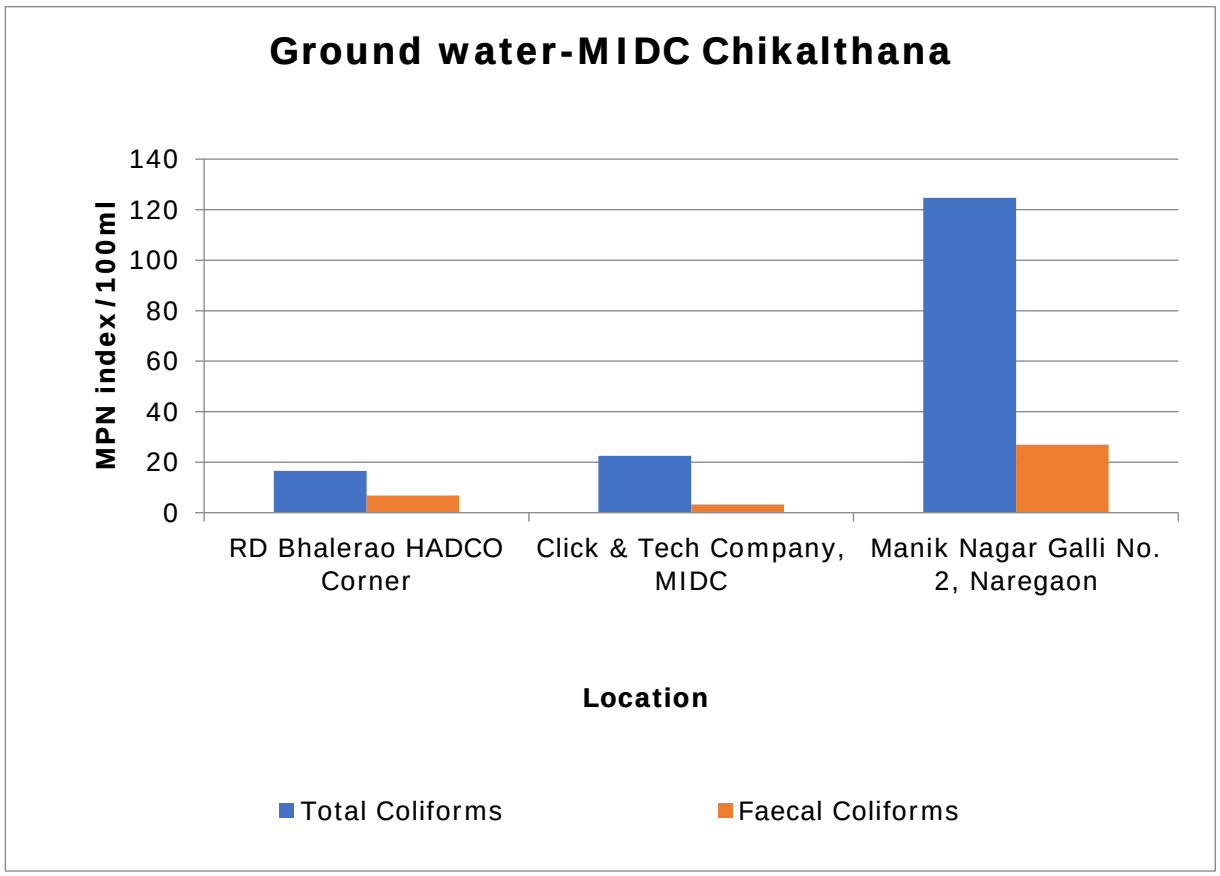
Graphs - Ground Water of MIDC Chikalthana

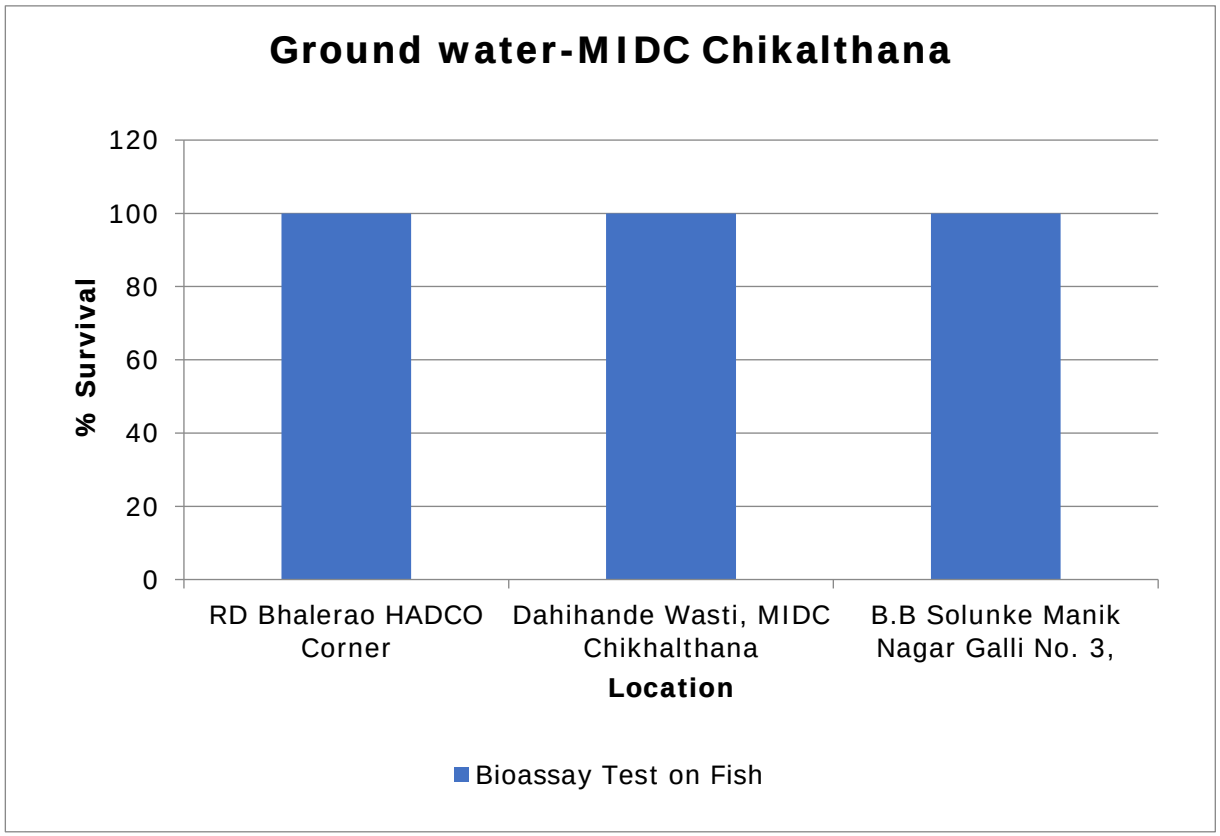





Ground water-MIDC Chikalthana
10
8
6
4
2
0
RD Bhalerao HADCO Corner
Dahihande Wasti, MIDC Chikhalthana
B.B Solunke Manik Nagar Galli No. 3,
Location
Sodium Adsorption Ratio
pH


Ground water-MIDC Chikalthana
Concentration (µmhos/cm)
4000
3500
3000
2500
2000
1500
1000
500
0
RD Bhalerao HADCO Corner
Dahihande Wasti, MIDC Chikhalthana
B.B Solunke Manik Nagar Galli No. 3,
Location
Electrical Conductivity


Ground water-MIDC Chikalthana
MPN index/100ml
140
120
100
80
60
40
20
0
RD Bhalerao HADCO Corner
Click & Tech Company, MIDC
Manik Nagar Galli No. 2, Naregaon
Location
Total Coliforms
Faecal Coliforms


Ground water-MIDC Chikalthana
% Survival
120
100
80
60
40
20
0
RD Bhalerao HADCO Corner
Dahihande Wasti, MIDC Chikhalthana
B.B Solunke Manik Nagar Galli No. 3,
Location
Bioassay Test on Fish

3. **MIDC Waluj:** Three ground water samples were collected from MIDC Waluj.

- All three water samples collected were observed as acceptable in general appearance, colour, smell and transparency.
- Concentration of parameters like pH, suspended solids, TDS and BOD were also well within the limits at all three samples collected.
- 100% survival was achieved in Fish Bioassay of all the three water samples.
- Metals like Arsenic, Nickel, Copper, Hexavalent Chromium etc. were observed either below the limit of quantification (BLQ) or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were either below the limit of quantification (BLQ) or below their standard limits in all 3 samples collected.
- Organo Chlorine Pesticides were also below the limit of quantification in all 3 samples collected.

Table 7.5 MIDC Waluj - Details of Sampling Location of Groundwater

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Open Well Mr. Prabhakar Mahalkar, Near Behind Siemens, MIDC Waluj, Aurangabad	19.852737	75.218755	26.06.2024	28.06.2024	30.06.2024
2.	Bore Well Pravin Ghule, Ghulevasti, Patoda Road MIDC Waluj	19.815424	75.248908	26.06.2024	28.06.2024	30.06.2024
3.	Bore Well Near Hanuman Temple, Jogeshwari, MIDC Waluj, ABD	19.82633	75.205309	26.06.2024	28.06.2024	30.06.2024

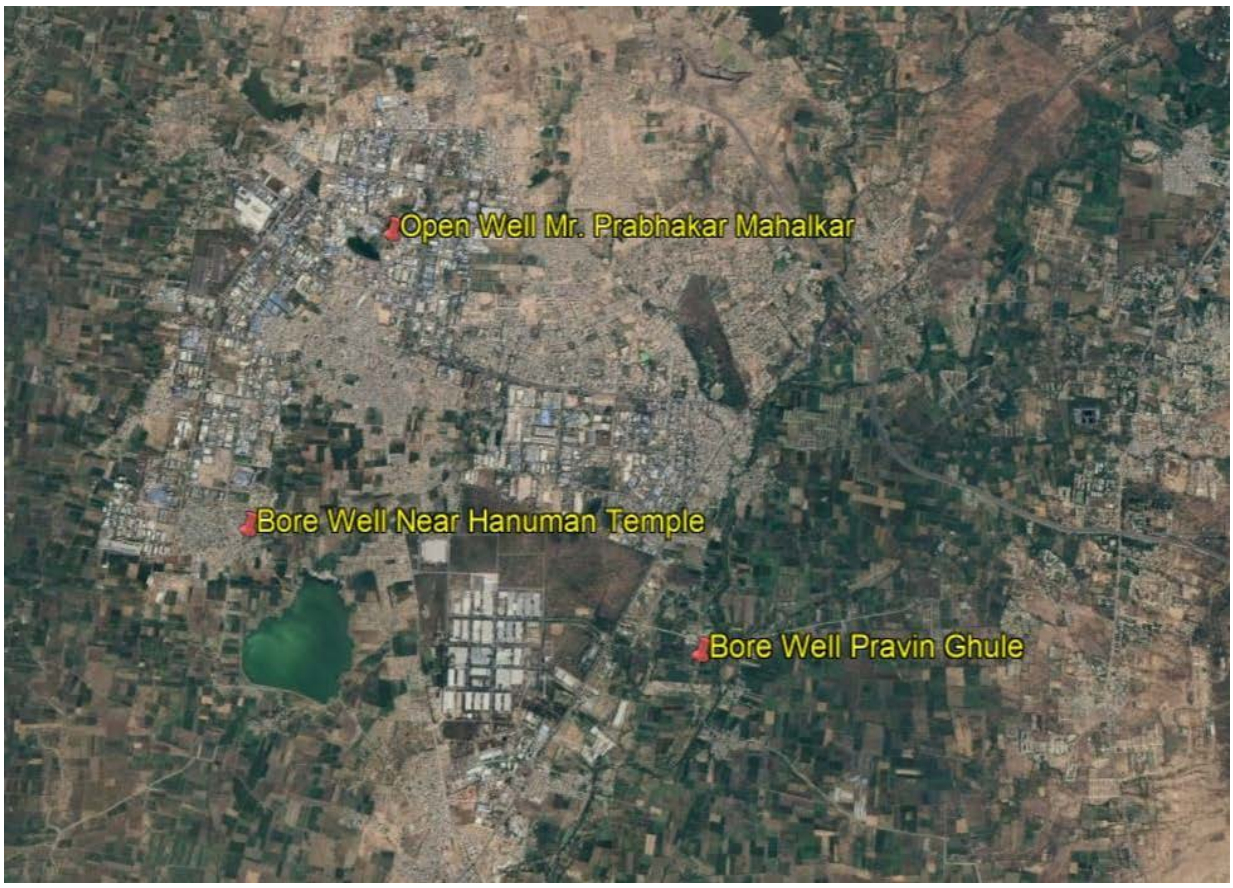


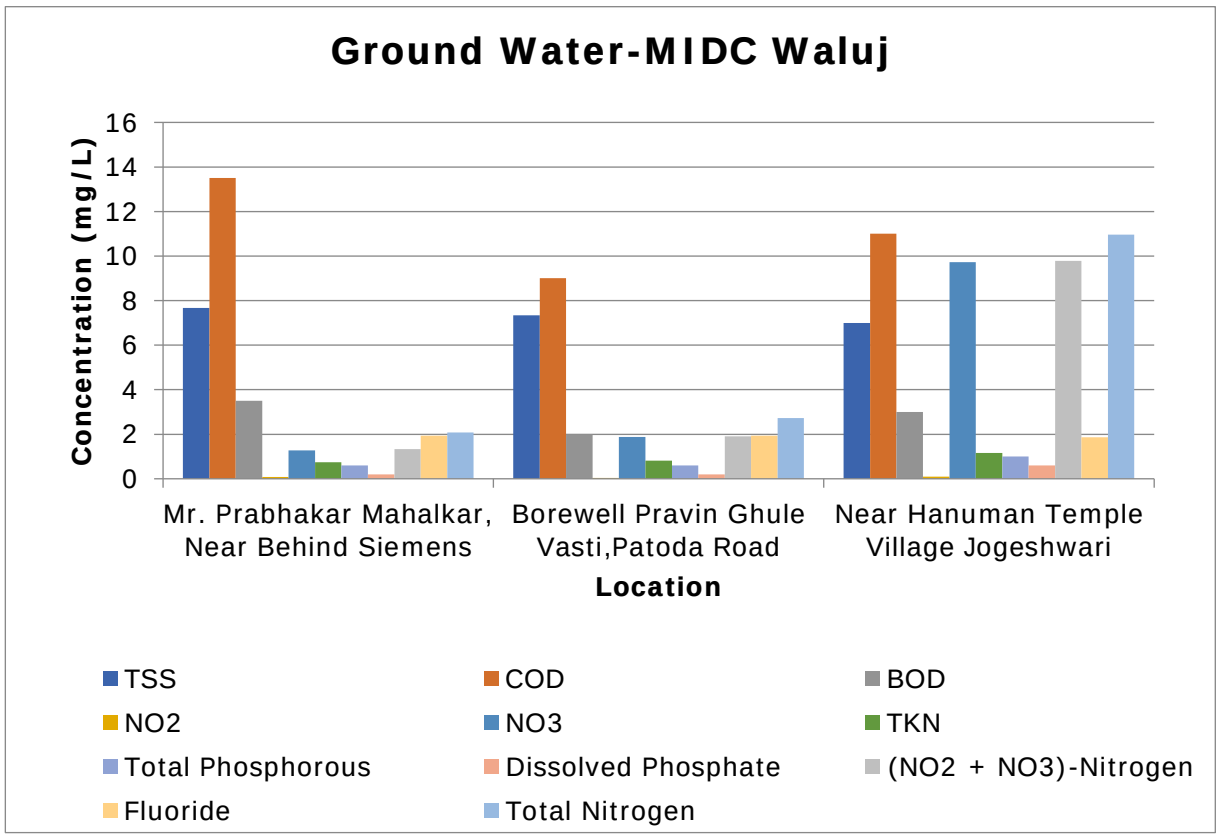
Fig: Geographical Locations of Ground Water Sampling MIDC Waluj

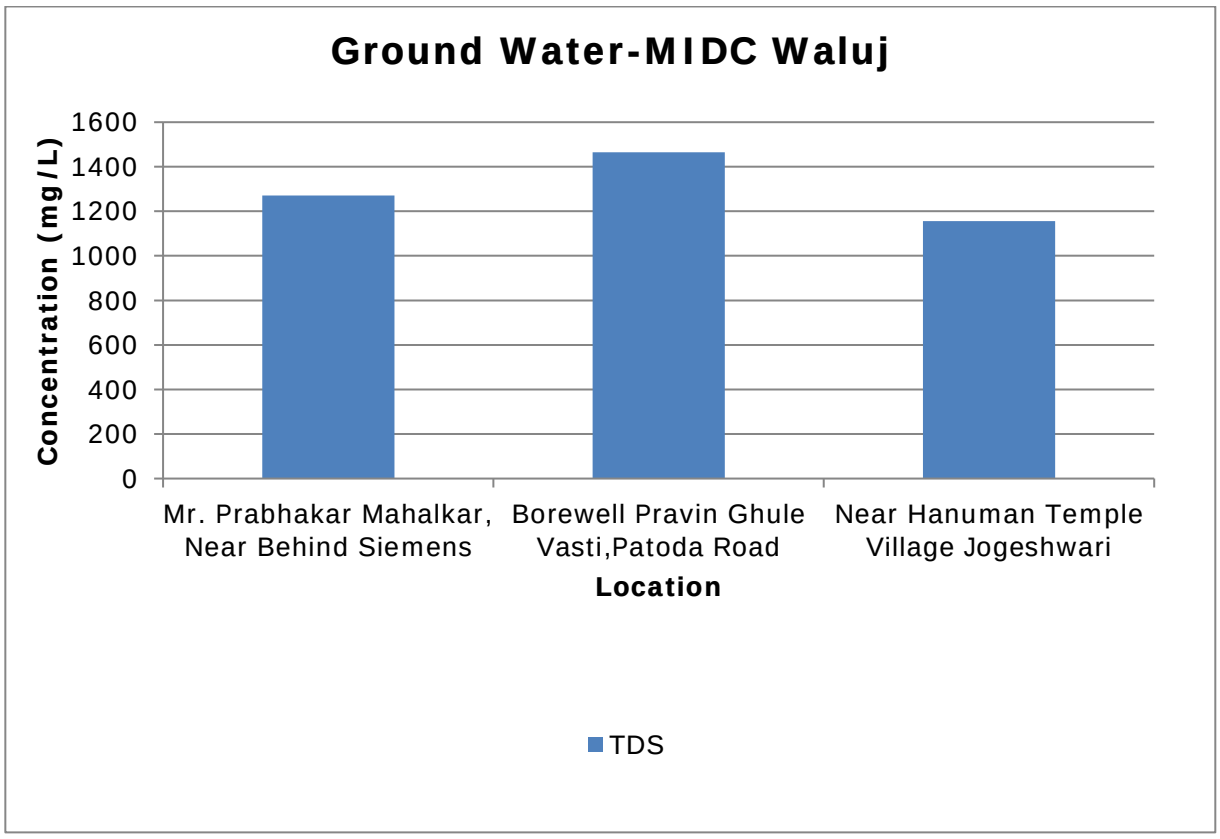
Table 7.6 MIDC Waluj - Results of Ground Water

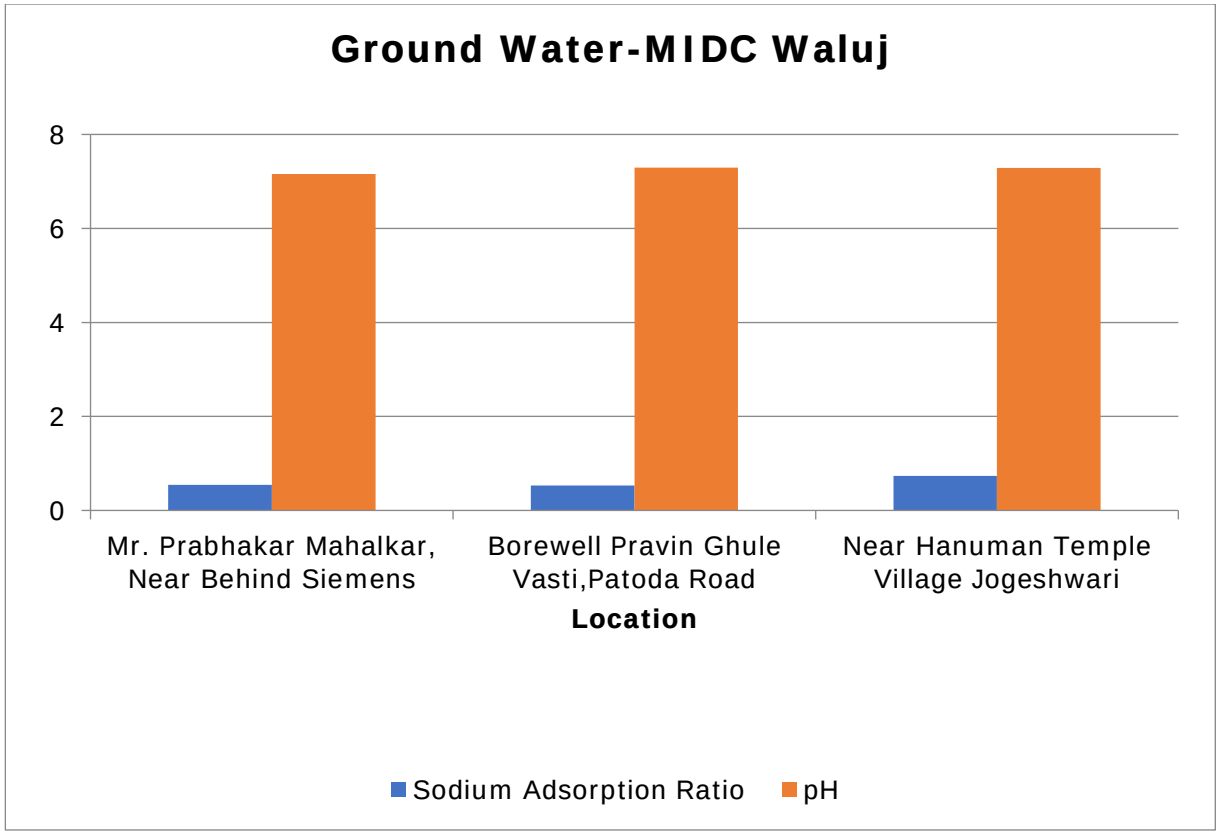
Parameters	Unit	Results		
		Mr. Prabhakar Mahalkar, Near Behind Siemens, MIDC Waluj, Aurangabad	Borewell Pravin Ghule Vasti,Patoda Road, MIDC Waluj, Aurangabad	Near Hanuman Temple Village Jogeshwari, MIDC Waluj, Aurangabad
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	floating matter Evident	No floating matter	No floating matter
Transparency	m	0.8	NA	NA
Temperature	Hazen	30	30	31
Colour	$_{o}C$	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.16	7.29	7.29
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	7.67	7.33	7.00
Total Dissolved Solids	mg/L	1271	1465	1155
Chemical Oxygen Demand	mg/L	14	9	11
Biochemical Oxygen Demand (3 days,27^{o}C)	mg/L	4	2	3

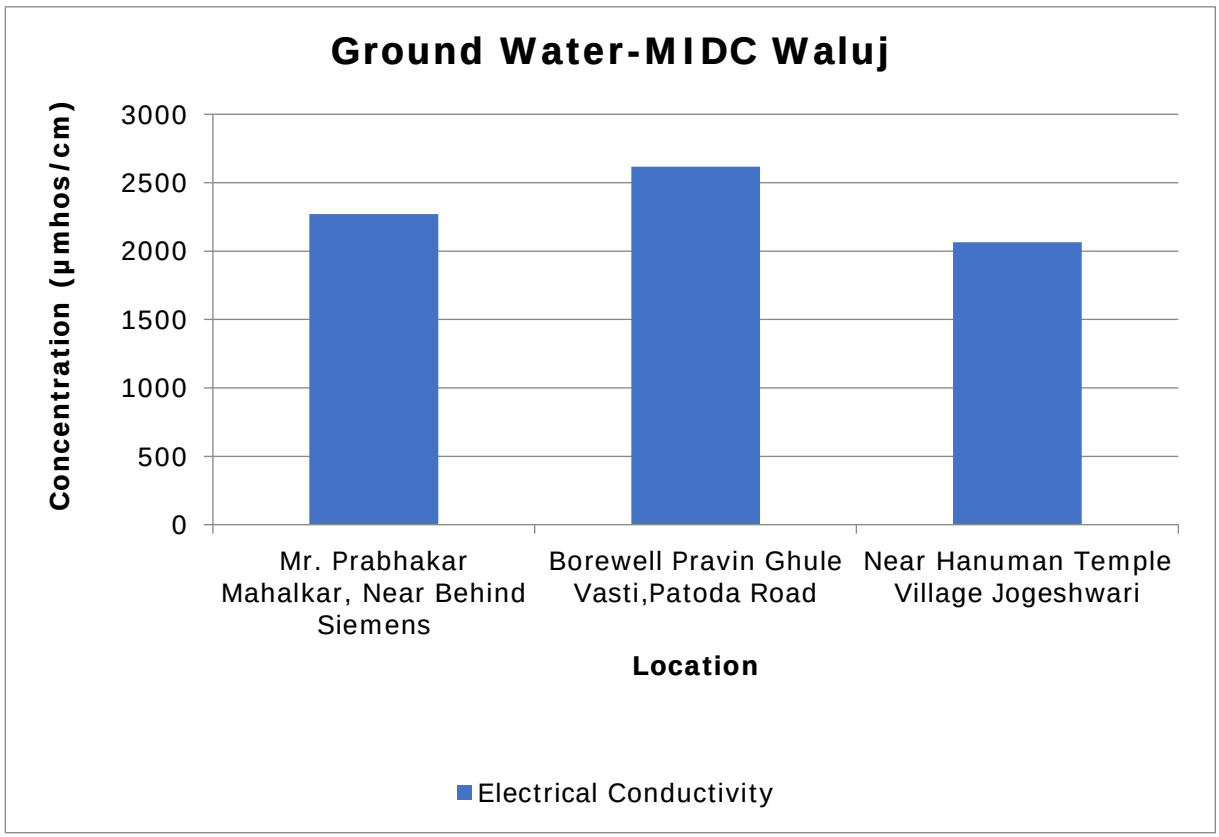
Parameters	Unit	Results		
		Mr. Prabhakar Mahalkar, Near Behind Siemens, MIDC Waluj, Aurangabad	Borewell Pravin Ghule Vasti,Patoda Road, MIDC Waluj, Aurangabad	Near Hanuman Temple Village Jogeshwari, MIDC Waluj, Aurangabad
Electrical Conductivity (at 25°C)	µmho/cm	2270	2617	2064
Nitrite Nitrogen (as NO_2)	mg/L	0.085	0.035	0.1
Nitrate Nitrogen (as NO_3)	mg/L	1.27	1.88	9.72
(NO_2 + NO_3)-Nitrogen	mg/L	1.33	1.91	9.79
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.93	1.93	1.87
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.2	0.2	0.6
Sodium Adsorption Ratio	-	0.54	0.53	0.73
Total Coliforms	MPN Index /100 mL	228	402	13
Faecal Coliforms	MPN Index /100 mL	20	12	12
Total Phosphate (as P)	mg/L	0.6	0.6	1
Total Kjeldahl Nitrogen (as N)	mg/L	0.75	0.82	1.16
Total Ammonia (NH_4+NH_3)-Nitrogen)	mg/L	0.12	0.125	0.13
Total Nitrogen	mg/L	2.07	2.73	10.97
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.065	BLQ
Nickel (as Ni)	mg/L	0.023	0.021	BLQ
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	0.009	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.44	0.229	0.17
Iron (as Fe)	mg/L	0.09	0.082	0.09
Vanadium (as V)	mg/L	0.05	0.054	0.03
Selenium (as Se)	mg/L	0.01	0.01	0.01
Boron (as B)	mg/L	0.24	0.38	0.19
Bioassay Test on fish	% survival	100	100	100

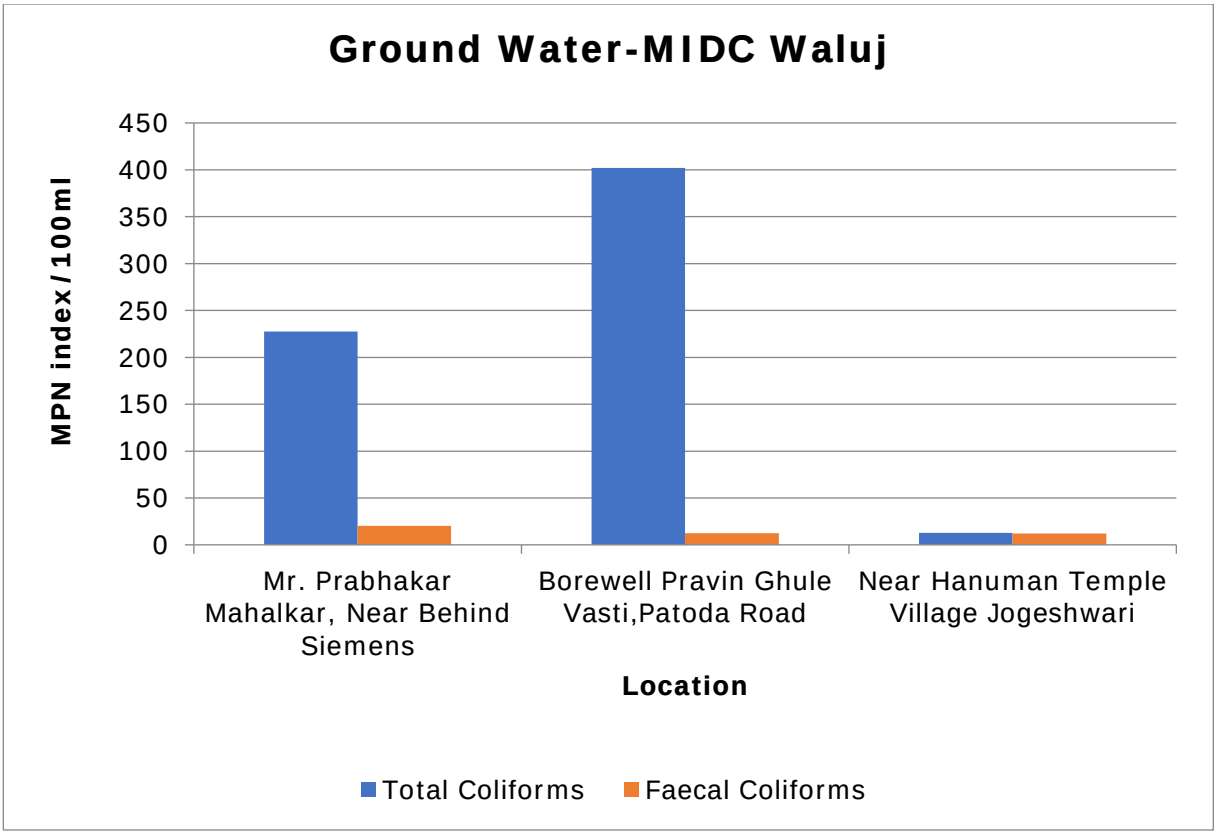
Graphs - Ground Water-MIDC Waluj

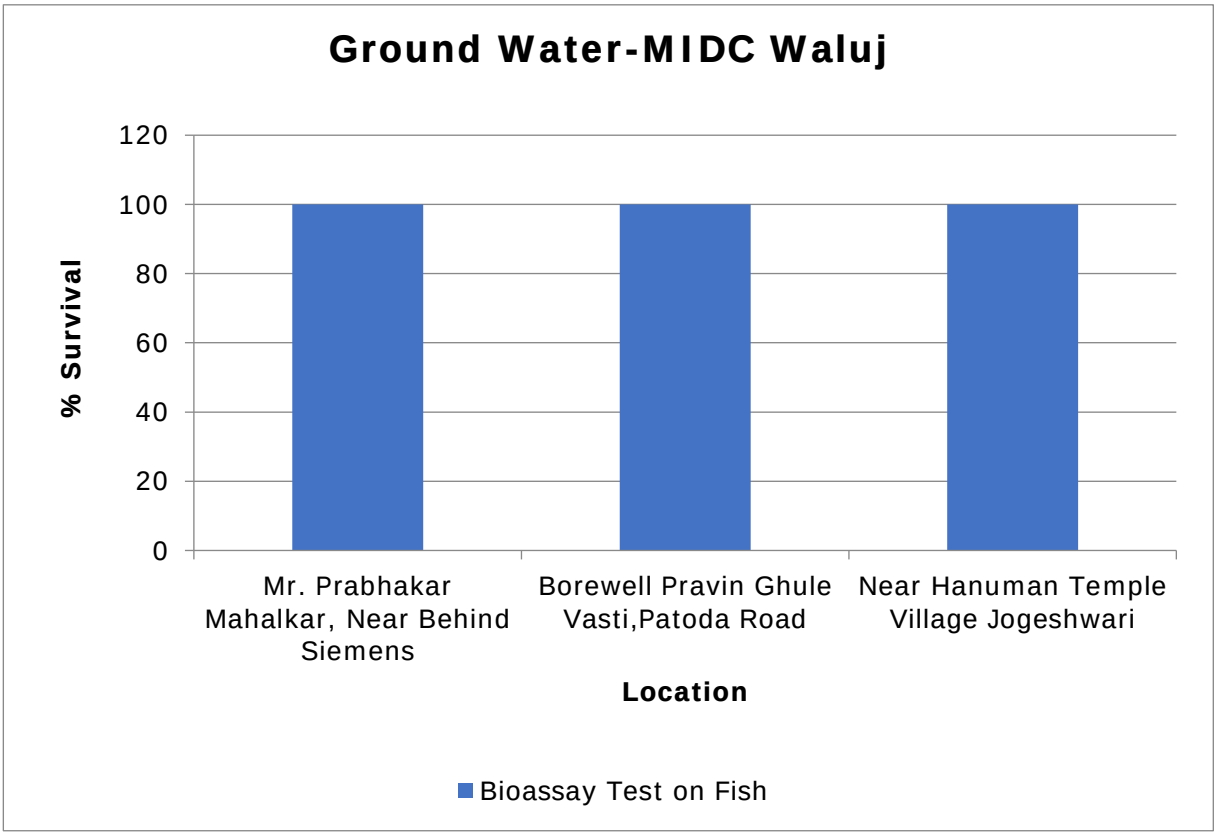





Ground Water-MIDC Waluj
8
6
4
2
0
Mr. Prabhakar Mahalkar, Near Behind Siemens
Borewell Pravin Ghule Vasti,Patoda Road
Near Hanuman Temple Village Jogeshwari
Location
Sodium Adsorption Ratio
pH


Ground Water-MIDC Waluj
Concentration (µmhos/cm)
3000
2500
2000
1500
1000
500
0
Mr. Prabhakar Mahalkar, Near Behind Siemens
Borewell Pravin Ghule Vasti,Patoda Road
Near Hanuman Temple Village Jogeshwari
Location
Electrical Conductivity


Ground Water-MIDC Waluj
MPN index/100ml
450
400
350
300
250
200
150
100
50
0
Mr. Prabhakar Mahalkar, Near Behind Siemens
Borewell Pravin Ghule Vasti,Patoda Road
Near Hanuman Temple Village Jogeshwari
Location
Total Coliforms
Faecal Coliforms


Ground Water-MIDC Waluj
% Survival
120
100
80
60
40
20
0
Mr. Prabhakar Mahalkar, Near Behind Siemens
Borewell Pravin Ghule Vasti,Patoda Road
Near Hanuman Temple Village Jogeshwari
Location
Bioassay Test on Fish

4. **MIDC Paithan:** Three ground water samples are collected from MIDC Paithan.

- All three water samples collected were acceptable in general appearance, colour, smell and transparency.
- Concentration of parameters like pH, suspended solids, Electrical conductivity and BOD were also well within the limits at all three samples collected.
- Fish survival was achieved as 80-87% during Fish Bioassay in all three samples of water.
- Metals like Arsenic, Nickel, Copper, Hexavalent Chromium etc. are observed either below the limit of quantification (BLQ) or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were found below the limit of quantification (BLQ) in all 3 samples collected.
- Organo Chlorine Pesticides were also below the detectable limit in all 3 samples collected.

Table 7.7 MIDC Paithan - Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Open Well, Allana Frigarifico, Paithan Road, Aurangabad	19.780822	75.288762	26.06.2024	28.06.2024	30.06.2024
2.	Bore Well Matoshri Aashram	19.821123	75.289182	26.06.2024	28.06.2024	30.06.2024
3.	Hand Pump Farola Village, Near WTP	19.725237	75.296234	26.06.2024	28.06.2024	30.06.2024

Ground Water Quality locations of MIDC Paithan Road

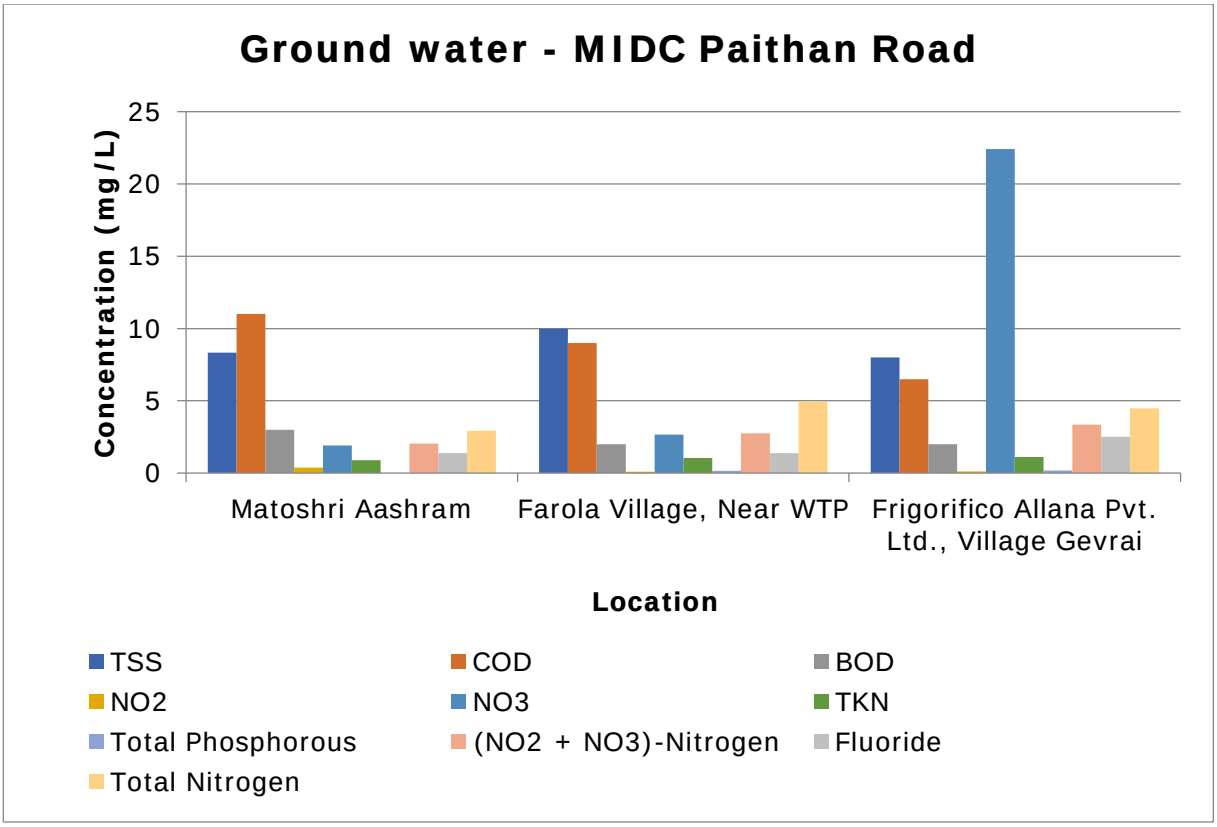
Fig: Geographical Locations of Ground Water Sampling MIDC Paithan

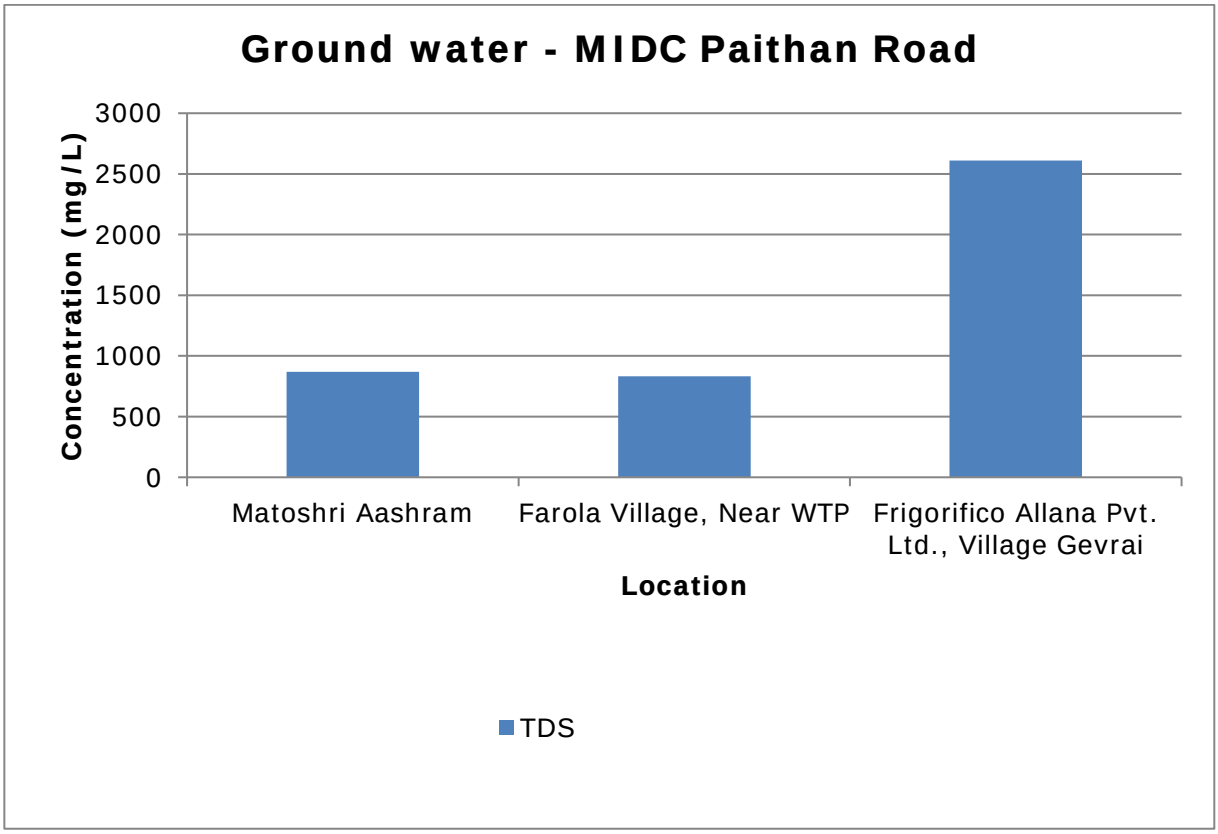
Table 7.8 MIDC Paithan - Results of Ground Water

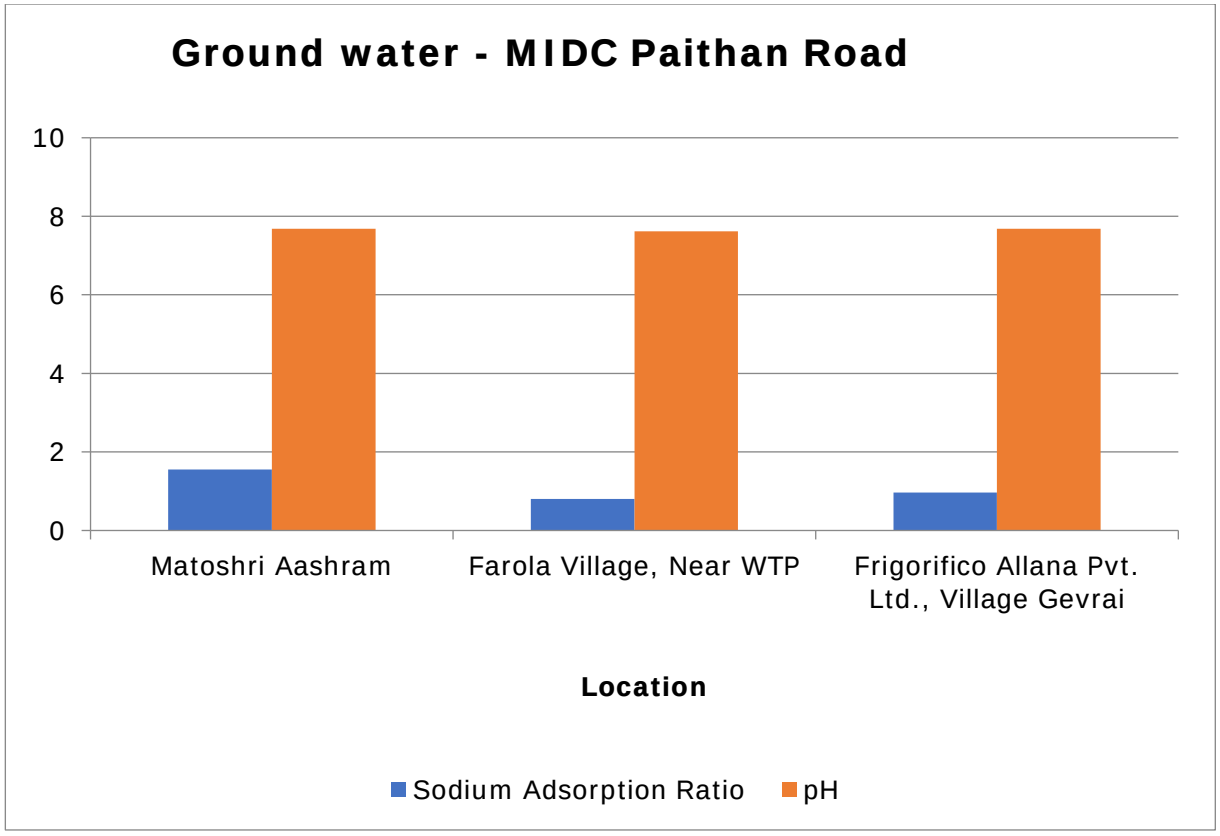
Parameters	Unit	Results		
		Matoshri Aashram, Paithan Road MIDC, Aurangabad	Farola Village, Near WTP, Paithan Road MIDC, Aurangabad	Frigorifico Allana Pvt. Ltd., Village Gevrai, MIDC Paithan Road, Aurangabad
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	floating matter Evident	No floating matter	No floating matter
Transparency	m	0.8	NA	0.767
Temperature	Hazen	29	29	29
Colour	°C	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.68	7.62	7.69
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	8.33	10.00	8.00
Total Dissolved Solids	mg/L	869	832	2609
Chemical Oxygen Demand	mg/L	11	9	7
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	3	2	2
Electrical Conductivity (at 25°C)	µmho/cm	1551	1485	4660

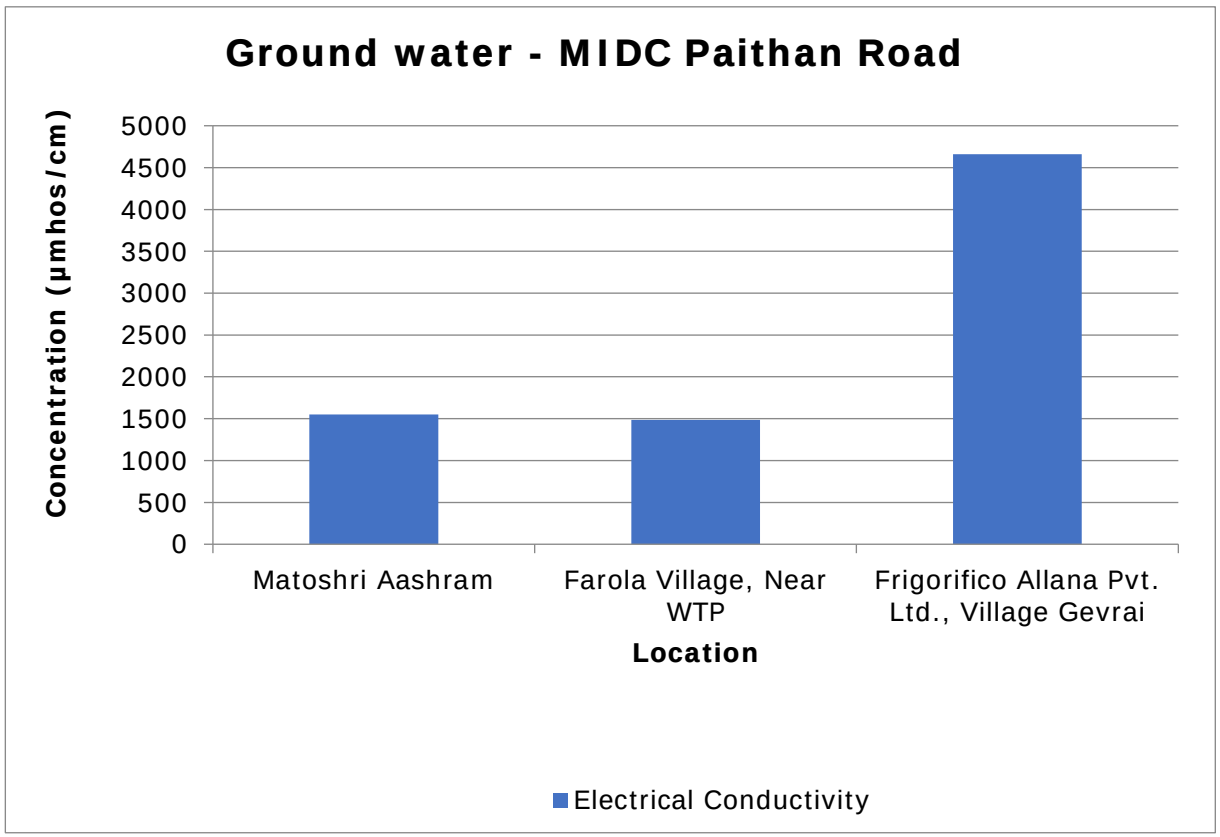
Parameters	Unit	Results		
		Matoshri Aashram, Paithan Road MIDC, Aurangabad	Farola Village, Near WTP, Paithan Road MIDC, Aurangabad	Frigorifico Allana Pvt. Ltd., Village Gevrai, MIDC Paithan Road, Aurangabad
Nitrite Nitrogen (as NO_2)	mg/L	0.37	0.09	0.105
Nitrate Nitrogen (as NO_3)	mg/L	1.92	2.66	22.42
(NO_2 + NO_3)-Nitrogen	mg/L	2.04	2.75	3.35
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.37	1.37	2.5
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	BLQ	BLQ
Sodium Adsorption Ratio	-	1.55	0.8	0.97
Total Coliforms	MPN Index /100 mL	98	29	536
Faecal Coliforms	MPN Index /100 mL	28	9	23
Total Phosphate (as P)	mg/L	BLQ	0.16	0.17
Total Kjeldahl Nitrogen (as N)	mg/L	0.90	1.04	1.12
Total Ammonia (NH_4+NH_3)-Nitrogen)	mg/L	0.22	0.21	BLQ
Total Nitrogen	mg/L	2.94	4.945	4.47
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.08	0.07	BLQ
Nickel (as Ni)	mg/L	0.011	BLQ	0.013
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	0.02	0.01	0.016
Lead (as Pb)	mg/L	0.01	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.27	0.05	0.42
Iron (as Fe)	mg/L	0.10	0.10	0.08
Vanadium (as V)	mg/L	0.04	0.02	0.06
Selenium (as Se)	mg/L	BLQ	0.01	0.09
Boron (as B)	mg/L	0.28	0.17	0.23
Bioassay Test on fish	% survival	87	80	87

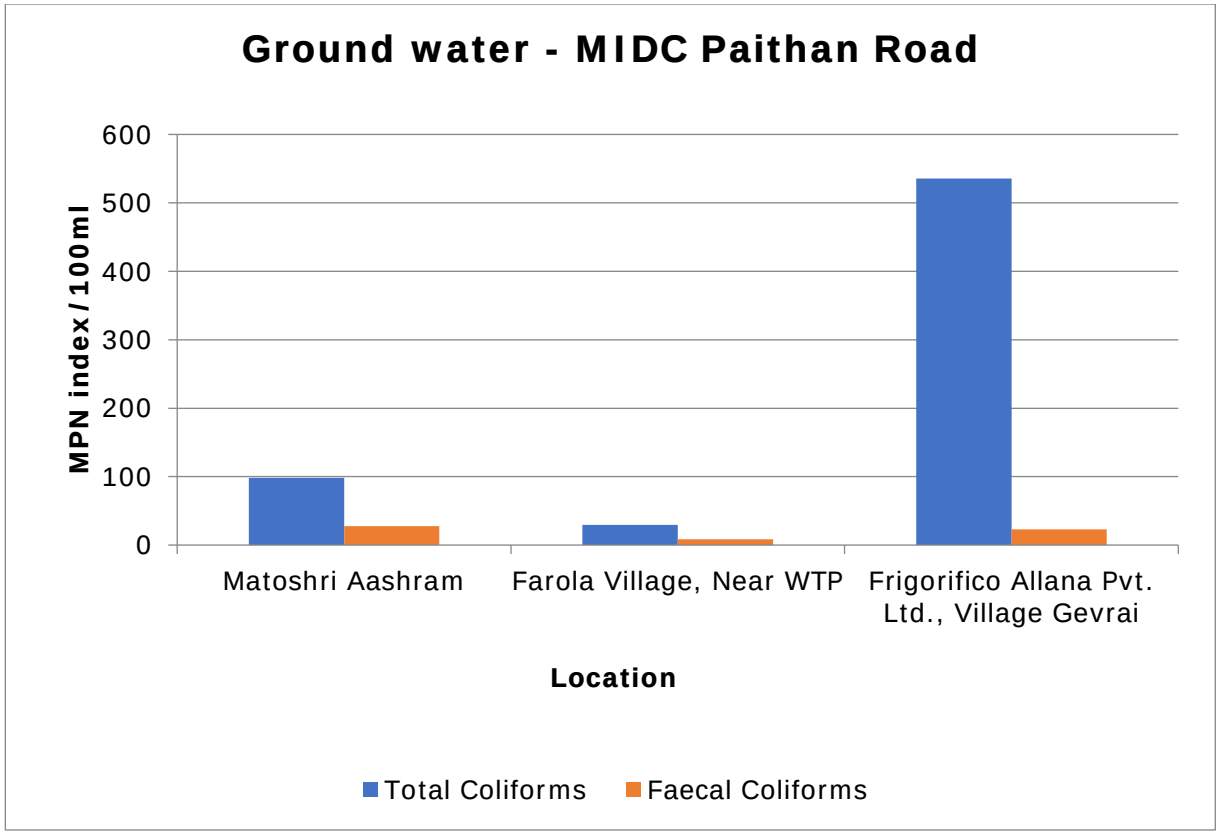
Graphs - Ground Water of MIDC Paithan

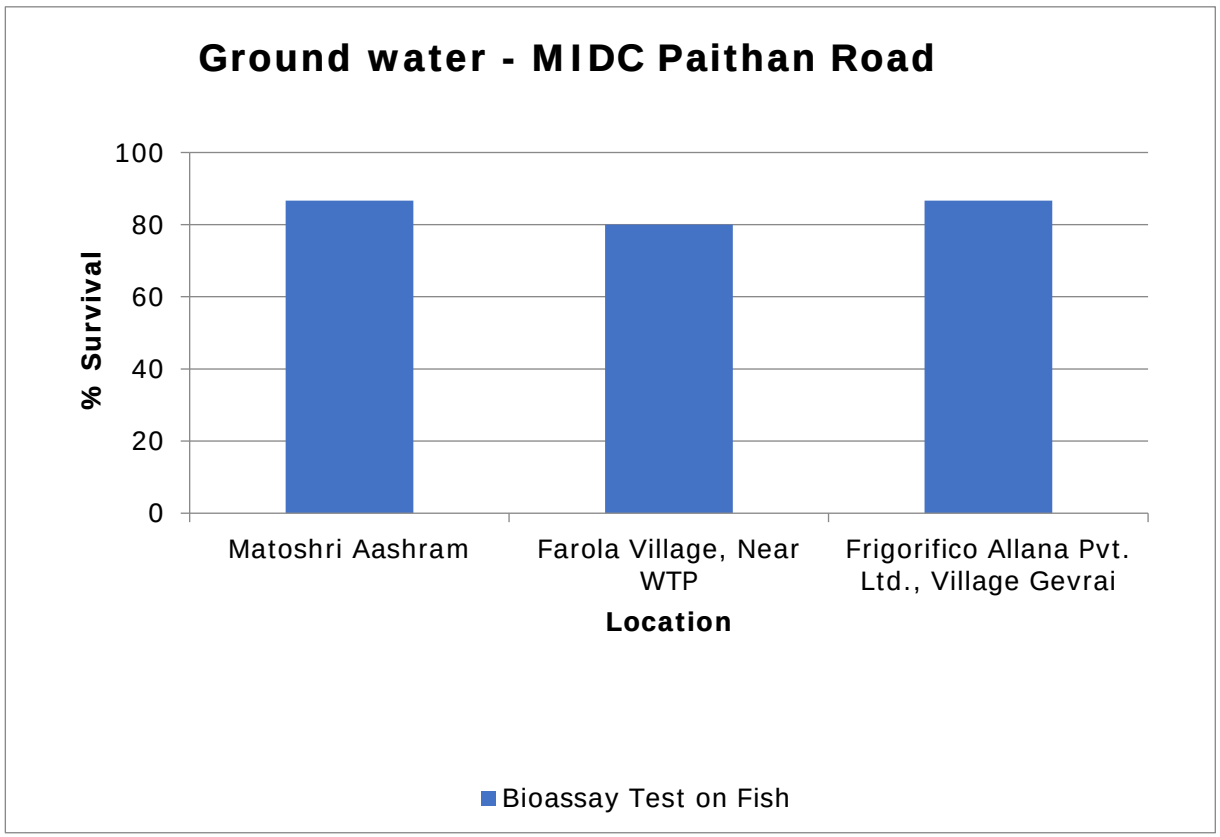

Ground water - MIDC Paithan Road
Concentration (mg/L)
25
20
15
10
5
0
Matoshri Aashram
Farola Village, Near WTP
Frigorifico Allana Pvt. Ltd., Village Gevrai
Location
TSS
COD
BOD
NO2
NO3
TKN
Total Phosphorous
(NO2 + NO3)-Nitrogen
Fluoride
Total Nitrogen


Ground water - MIDC Paithan Road
Concentration (mg/L)
3000
2500
2000
1500
1000
500
0
Matoshri Aashram
Farola Village, Near WTP
Frigorifico Allana Pvt. Ltd., Village Gevrai
Location
TDS


Ground water - MIDC Paithan Road
10
8
6
4
2
0
Matoshri Aashram
Farola Village, Near WTP
Frigorifico Allana Pvt. Ltd., Village Gevrai
Location
Sodium Adsorption Ratio
pH


Ground water - MIDC Paithan Road
Concentration (µmhos/cm)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Matoshri Aashram
Farola Village, Near WTP
Frigorifico Allana Pvt. Ltd., Village Gevrai
Location
Electrical Conductivity


Ground water - MIDC Paithan Road
MPN index / 100ml
600
500
400
300
200
100
0
Matoshri Aashram
Farola Village, Near WTP
Frigorifico Allana Pvt. Ltd., Village Gevrai
Location
Total Coliforms
Faecal Coliforms


Ground water - MIDC Paithan Road
% Survival
100
80
60
40
20
0
Matoshri Aashram
Farola Village, Near WTP
Frigorifico Allana Pvt. Ltd., Village Gevrai
Location
Bioassay Test on Fish

C: Receptor

Component C (Impact on Human Health)	
Main - 10	
% increase in cases	**Marks**
<5%	**0**
5-10%	**5**
>10%	**10**

- % increase is evaluated based on the total no. of cases recorded during two consecutive years.
- For Air Environment, total no. of cases related to Asthma, Bronchitis, Cancer, Acute respiratory infections etc. are to be considered.
- For surface water/ ground water Environment, cases related to Gastroenteritis, Diarrhoea, renal (kidney) malfunction, cancer etc are to be considered.
- For the above evaluation, the previous 5 years records of 3-5 major hospitals of the area shall be considered.

Annexure – I Health Related Data enclosed.

9. CEPI Score

Comprehensive Environmental Pollution Index (CEPI) is intended to act as early warning tool which helps in categorization of industrial clusters/ areas in terms of priority of needing attention. The CEPI score have been calculated based on CPCB Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016. The scoring system involves an algorithm that considers the basic selection criteria. It is proposed to develop the CEPI based on sources of pollution, real time observed values of the pollutants in the ambient air, surface water and ground water in & around the industrial cluster and health related statistics. The present study is the compilation of pre-monsoon season.

Table 8.1 CEPI score of the Pre-monsoon season 2024 is given below:

	A1	A2	A	B	C	D	CEPI
Air Index	3.5	2.5	8.75	1.5	5	5	**20.3**
Water Index	3	2.5	7.50	43.5	0	5	**56.0**
Land Index	1.75	2.5	4.375	27.75	0	5	**37.1**
						Aggregated CEPI	**59.3**

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI Score June 2024	20.30	56.00	37.10	**59.30**
CEPI Score March 2024	25.00	43.30	53.00	**58.10**
CEPI Score June 2023	24.00	54.50	46.40	**59.60**
CEPI Score March 2023	21.90	55.90	36.00	**59.40**
CEPI Score June 2021	15.50	54.38	53.00	**58.12**
CEPI Score March 2021	23.00	53.90	53.75	**59.60**
CEPI score March 2020	53.80	34.50	38.50	**59.90**
CEPI score June 2019	25.00	58.50	17.50	**60.31**
CEPI score March 2019	22.75	23.25	62.00	**64.01**
CEPI score June 2018	36.25	55.25	56.25	**65.01**

	Air Index	Water Index	Land Index	CEPI
CEPI score March 2018	56.00	34.00	50.00	**64.38**
CPCB CEPI score March 2018	45.00	65.38	28.75	**69.85**

The result shows that CEPI score of present report is 59.3. This time CEPI is observed lower than the CPCB CEPI score (69.85) of March 2018.

CEPI Score Calculation:

Pollutant	Group	A1	A2	A (A1 X A2)
CO	B	2	Moderate	
As	B	1		
PM10	B	0.5		
		3.5	**2.5**	**8.75**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF score (B)	
CO	1.55	2	0.78	0	16	L	1.5
As	0.62	6	0.10	0	16	L	0
PM10	57.56	100	0.58	0	16	L	0
B	**1.5**						

C	**5**	**5-10%**
D	**5**	**A-IA-A**

Air CEPI	**(A+B+C+D)**	**20.3**

Pollutant	Group	A1	A2	A (A1 X A2)
TP	B	2	Moderate	
Se	B	0.5		
BOD	B	0.5		
		3	**2.5**	**7.5**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF score (B)	
TP	1.68	0.3	5.60	17	24	C	30
Se	1.01	0.01	100.90	4	24	M	3.5
BOD	15.56	8	1.95	13	24	C	10
B	**43.5**						

C	**0**	**<5 %**
D	**5**	**A-IA-A**

Water CEPI	**(A+B+C+D)**	**56.0**

Pollutant	Group	A1	A2	A (A1 X A2)
Flouride	A	1	Moderate	
Fe	A	0.25		
Se	B	0.5		
		1.75	**2.5**	**4.375**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF score (B)	
Flouride	1.81	1.5	1.21	8	12	H	20.25
Fe	0.30	0.3	1.00	4	12	M	4.25
Se	0.02	0.01	2.00	1	12	M	3.25
B	**27.75**						

C	**0**	**<5 %**
D	**5**	**A-IA-A**

Land CEPI	**(A+B+C+D)**	**37.1**

Water CEPI Score (im) **56.0**

Land CEPI Score (i2) **37.1**

Air Score (i3) **20.3**

Aggregated CEPI Score = **im + {(100- im)*i2/100)*i3/100)}**

where, im = maximum sub index; and i2 and i3 are sub indices for other media

CEPI Score **59.3**

10. Conclusion

Ambient Air Quality

- In the present study, 16 AAQ stations of 4 MIDCs namely: MIDC Shendra, MIDC Chikalthana, MIDC Waluj and MIDC Paithan, were identified in the CEPI impact area to cover both upwind and cross wind directions and AAQ survey was conducted.
- All air quality parameters are observed well within the limits as per NAAQS.
- In the CEPI score calculated for Air environment by CPCB in March 2018, the concentration of PM_{10} and $PM_{2.5}$ has exceeded at 50% of the studied locations, which contributed to air index (45.00). However, in the present report, concentration of both PM_{10} and $PM_{2.5}$ are found below permissible levels resulted in less exceedance factor, hence lower air index (20.3).

Surface Water Quality

- To understand the quality of treated effluent, samples were collected from 23 locations of different MIDCs.
- Concentration of BOD, and Total Dissolved Solids was found to exceed the acceptable limits at few places.
- All the industries in the Aurangabad region are either reusing the treated trade effluent as sewage in their process or gardening.
- In the CEPI score calculated for Water Environment by CPCB in March 2018, concentration values of BOD, TDS, TKN and TP were higher and exceeded at 50% of studied locations as observed in the present study also.

Ground Water Quality

- Total 12 ground water samples were collected from different Dug well, well and Bore well in different regions of four MIDCs.
- All the parameters of groundwater analysis were found within the permissible limits, except Floride content which is found to exceed in few of the water samples.
- In the CEPI score calculated for Land Environment by CPCB in March 2018, all the critical parameters were observed within the permissible limits.

CEPI Score

- The CEPI Score of pre-monsoon season is 59.3.
- During the calculation of CEPI score, water Index is calculated highest with 56.0, followed by the land Index 37.1 and Air index as 20.3. The parameters of surface water and ground water in

Aurangabad region are observed well within the limits. Hence, aggregated CEPI score is calculated as 59.3, which is lower than the CPCB CEPI score March 2018 which was 69.85.

- In CEPI score of CPCB 2018, Air index and water index were higher as compared to the present (June, 2024) indices. However, land index of present CEPI (37.1) is little higher than the land CEPI (28.75) calculated by CPCB in 2018
- In comparison with the CEPI Score of June 2023, there is a decrease in the air and Land Index, but little rise is observed in water index.
- As per the CPCB CEPI calculation revised in 2016, Health statistics represented by Receptor C in CEPI Calculation, also plays an important role.
- Collective efforts of regional office of MPCB, NMMC, administration and environmental organizations are resulting in significant reduction in pollution level over the years.
- Efforts taken to reduce the pollution level is represents factor D in CEPI Calculation, which also affects the overall CEPI score.
- The present study is the compilation of pre-monsoon season, which results in dilution of environmental samples resulting in lower pollution load, hence also affects the total score.
- In conclusion, approximately 15% decrease in CEPI score is observed from 69.85 in 2018 to 59.3 in June 2024.

11. Efforts taken by MPCB to control and reduce Environmental Pollution Index

- Encouragement to the industries to switch over to cleaner fuel from existing fuel coal.
- All the water polluting industries change their underground ETP tank to overhead.
- Waste collection and segregation centres: The AMC has already installed and commissioned the MSW Processing Plant of 150MT/day capacity at Chikalthana and Padegaon. The Biogas Plant at Kanchanwadi of 30 TPD Biomethanization Technology has been installed and commissioned.
- Construction of one Common Effluent Treatment plant (CETP).
- Sixteen CEMS are installed for Air and Water in Large and Medium scale RED category industries
- Arrangement of scientific collection and treatment of sewage generated: Aurangabad Municipal Corporation has provided Sewage Treatment Plants at Kanchanwadi — 161 MLD, Zalta — 35 MLD, Padegaon — 10 MLD and Dr. Salim Ali Lake — 5 MLD, which is of adequate capacity for treating the domestic sewage generated from Aurangabad city.
- Installation of three Continuous Ambient Air Quality Monitoring Stations (CAAQMS) i.e. in MIDC Waluj, Deogiri Engineering College premises and at MPCB Office premises.
- Nine monitoring stations under the National Water Quality Monitoring Programme (NWMP) are also installed to check the water quality of the area.
- Steps are taken for industrial areas/other units to recycle 100% treated effluent to achieve zero liquid discharge (ZLD). Time to time directions were issued to the industries to provide ZLD systems &to recycle 100 % treated effluent to achieve ZLD. Total 23 industries have provided the ZLD system.
- Steps taken to reduce dust emission:
  a) AMC has widened the roads and squares to avoid traffic congestion.
  b) Road sweeping machines have been provided by AMC.
  c) Condition of city roads improved under Smart City.
  d) The industries have been instructed to operate the Air Pollution Control System like dust collector, scrubber efficiently to achieve the consented standards.
- Tree plantation: Steps taken by MPCB to increase tree plantation in industrial premises upto 40%.
- Other initiatives taken to control and reduce pollution in air, surface water and groundwater.
- The work of MSW Processing Plant of 150 MT/day capacity (Each) at Harsool is in progress.
- Public awareness campaign is taken.
- Continuous vigilance & monitoring of industries carried out by MPCB.
- State Govt. has approved DPR of Rs. 243.89 Crs for underground sewage network in Satara Deolai Area.

- Inititiatives have been taken to reduce the dust from the city by Procurement of mechanized road sweeping machines and Procurement of Dust Suppression Vehicles with Multi-Purpose Sprayer
- Installation of Stationary/Movable Cannon Dust Suppression Systems
- Creation of green buffers along the traffic corridors
- Introduction of water/mist fountains for major traffic intersections
- Greening of open areas, gardens, community places and Maintaining pothole free roads, Blacktopping/paving of roads
- The average monthly Air Quality Index (AQI) of last six months from January 2024 to June 2024 is reported in the range of 83-191 at Devgiri College region, 62-169 at Aurangabad MPCB Bhavan, 44-114 at Walunj MIDC, Aurangabad which indicates satisfactory to moderate level of air pollution in that area.

Dust Suppression Vehicles with Multi-Purpose Sprayer-Mechanized Road Sweepers

Public Awareness Activities

Miyawaki Plantation

Biomining of Legacy Waste

Smart Traffic Signals

Pothole free roads

Solar Roof Top

Continuous Ambient Air Quality Monitoring Station (CAAQMS)

Ambient Air Quality Monitoring (AAQM) Van

12. Photographs

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<tr>
<td>Ambient Air Sampling at Skoda Auto – MIDC Shendra</td>
<td>Ambient Air Sampling at Wockhardt R & D MIDC Chikhltana</td>
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<td> 
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</tr>
<tr>
<td>Ambient Air Sampling at Goodyear Tyre MIDC Waluj</td>
<td>Ambient Air Sampling at CIE Casting India– MIDC Paithan</td>
</tr>
</table>

	
Surface Water Sampling – Pond Water AURIC City MIDC Shendra	**Surface Water Sampling at Near Shani Mandir –MIDC Chikhaltana**
	
Surface Water – Lake Water Behind K Sector -MIDC Waluj	**Surface Water Dam Water Back Side of WTP, Farolla-MIDC Paithan**

	
Ground Water Sampling – Hanuman Temple MIDC Shendra	**Ground Water Sampling at Borewell Dahihande Wasti Chikhaltana**
	
Groundwater Sampling – Open Well Mr. Prabhakar Mahalkar-MIDC Waluj	**Groundwater Sampling Hand Pump Near WTP, Farolla Village-MIDC Paithan**

Annexure – I Health Related Data

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Post-monsoon Season (December 2023- February 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	AURANGABAD
Name of the major health center/ organization	Medicover Hospital, Chistiya Chowk Aurangabad
Name and designation of the Contact person	Yogesh. Patil
Address	N-6 AURANGABAD

S No.	Diseases	No. of Patients Reported	
		Year 2022-2023	Year 2023-2024
AIRBORNE DISEASES			
1.	Asthma	200	300
2.	Acute Respiratory Infection	178	210
3.	Bronchitis	110	140
4.	Cancer	380	280
WATERBORNE DISEASES			
1.	Gastroenteritis	180	190
2.	Diarrhea	220	250
3.	Renal diseases	230	300
4.	Cancer	250	300

Date: 22/7/24

MEDICOVER HOSPITALS

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Post-monsoon Season (December 2023- February 2024) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	AURANGABAD
Name of the major health center/ organization	United CIGMA Hospital, Aurangabad
Name and designation of the Contact person	Mr. Abhishek Patil (MRD).
Address	Ch. Sambhajinagar.

S No.	Diseases	No. of Patients Reported	
		Year 2022-2023	Year 2023-2024
AIRBORNE DISEASES			
1.	Asthma	1450	1570
2.	Acute Respiratory Infection	880	845
3.	Bronchitis	980	997.
4.	Cancer	34	38
WATERBORNE DISEASES			
1.	Gastroenteritis	360	350
2.	Diarrhea	290	310
3.	Renal diseases	870	845
4.	Cancer	1380	1295

Date:

Signature

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Post-monsoon Season (December 2023- February 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	AURANGABAD
Name of the major health center/ organization	Sawarkar Hospital, Aurangabad
Name and designation of the Contact person	
Address	

CIDCO, N-1, Hospital,
Municipal Corporation,
Chhatrapati Sambhajinagar

S No.	Diseases	No. of Patients Reported	
		Year 2022-2023	Year 2023-2024
AIRBORNE DISEASES			
1.	Asthma	1	–
2.	Acute Respiratory Infection	1626	1832
3.	Bronchitis	–	–
4.	Cancer		–
WATERBORNE DISEASES			
1.	Gastroenteritis	1	–
2.	Diarrhea	29	32
3.	Renal diseases	–	–
4.	Cancer	–	–

Date: 18/07/2024

Signature

MEDICAL OFFICER
CIDCO, N-1, Hospital,
Municipal Corporation,
Chhatrapati Sambhajinagar