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

PIMPRI-CHINCHWAD

Post-Monsoon (December 2024 - February 2025)

MAHARASHTRA

LiFE Lifestyle for Environment

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

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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

Pimpri-Chinchwad was 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 location with the additional location of samplings 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 December 2024 to February 2025 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 eight locations. The concentration of all the ambient air parameters was found well within the limits prescribed in NAAQS 2009, except parameter Nitrogen Dioxide (NO_2) at 5 locations out of 8 locations. Total Phosphate, Total Kjeldahl Nitrogen and Iron is found above the standard limits in few locations in surface water monitoring. Land index is represented by groundwater in the CEPI. Ground water parameters were found to be within the permissible limits, except BOD and Iron in few location.

Based on the study conducted by CPCB during the period January 2018, the CEPI score of Pimpri-Chinchwad region as per the revised guidelines of CEPI (2016) was 52.16 (Air Index–52, Water Index-6.25 and Land Index–5.25). However, the present study reports aggregated CEPI score of Pimpri-Chinchwad region of post-monsoon season (March, 2025), the present CEPI score is 49.60 (Air Index–18.75, Water Index- 46.25 and Land Index–33.25). 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, 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.

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 feces, 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.

This report explores the methodology, findings, and implications of both the CEPI assessment and the monitoring, sampling, and analysis of ambient air quality, surface water quality, and groundwater quality in the polluted industrial areas of Pimpri Chinchwad, Maharashtra. Situated on the north western limits of Pune, Maharashtra, Pimpri Chinchwad has experienced rapid industrial growth since its industrialization began in 1954. It has become a key hub for major Indian automobile companies, including Kinetic Engineering, Tata Motors, Mahindra & Mahindra Ltd., and Bajaj Auto, among others. In addition to the automobile sector, the region has seen significant growth in the software and IT industries.

The report is based on the revised CEPI version from 2016, which evaluates environmental quality through the dimensions of air, water, and land. The Comprehensive Environmental Pollution Index (CEPI) is a calculated value that characterizes environmental conditions at a given location, using a framework that assesses sources, pathways, and receptors. The CEPI reports play a crucial role in guiding targeted interventions, regulatory enforcement, and community engagement, all aimed at reducing pollution and protecting public health in the region. Despite ongoing challenges, the CEPI action plans provide a roadmap for addressing environmental issues and promoting sustainable development in Pimpri Chinchwad.

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 selected Pollution Industrial Areas (PIAs) of Pimpri-Chinchwad, 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 Pimpri-Chinchwad

Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Ambient Air Quality	08	**08**	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)	02	**02**	Chloroform, Carbon Tetrachloride, 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-Isopropyl toluene, M-Xylene, P-Xylene, Styrene, Cumene 1,2,3-Trichloropropane, N-Propyl benzene, 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-Trichlorobenzene, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, 2,2-Dichloropropane, Dibromo methane, Toluene, O-Xylene, Bromoform,

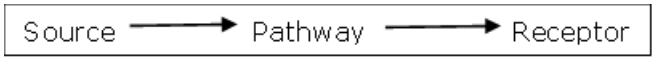
Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
			1,1,2,2-Tetrachloroethane, 4-Chlorotoluene, 1,1-Dichloroethylene, Trans-1,2-Dichloroethylene, 1,1-Dichloroethane, CIS-1,2-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality Monitoring	**Surface water** 06	**06**	**(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 and PCT, 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 06	**06**	

Table 3.2 Frequency of Sampling

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



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.

5. Air Environment

For studying the Air Environment of Pimpri-Chinchwad 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.*

In Pimpri-Chinchwad eight locations have been monitored of checking the Ambient Air Quality (AAQ). The concentration of all the ambient air parameters was found well within the limits prescribed by NAAQS except Nitrogen Dioxide (NO_2) 5 locations out of 8 lovations.

Table 5.1 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.	Thergaon Near Puduji Industries	18°62'20.21"N	73°72'27.37"E	21.01.2025	23.01.2025	25.01.2025
2.	Akurdi Near Force Motor	18°65'13.19"N	73°78'37.25"E	21.01.2025	23.01.2025	25.01.2025
3.	MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall	18°64'10.96"N	73°81'97.94"E	21.01.2025	23.01.2025	25.01.2025
4.	Pimpri Chinchwad Municipal Corporation	18°62'83.79"N	73°80'33.78"E	21.01.2025	23.01.2025	25.01.2025
5.	MIDC Bhosari Near Amphenol Area Pune	18°61'10.96"N	73°80'33.78"E	22.01.2025	24.01.2025	26.01.2025
6.	Moshi Municipal Solid Waste Disposal Site	18°65'77.29"N	73°85'75.64"E	22.01.2025	24.01.2025	26.01.2025
7.	Charoli Moshi Crusher Area	18°65'79.49"N	73°86'49.35"E	22.01.2025	24.01.2025	26.01.2025
8.	Moshi RR Scrap	18°68'03.20"N	73°83'55.38"E	22.01.2025	24.01.2025	26.01.2025

Table 5.2 Details of Sampling Location of Volatile Organic Compounds (VOCs) Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	MIDC Bhosari Near Amphenol Area Pune	18°61'10.96"N	73°80'33.78"E	21.01.2025	23.01.2025	25.01.2025
2.	Moshi Municipal Solid Waste Disposal Site	18°65'77.29"N	73°85'75.64"E	22.01.2025	24.01.2025	26.01.2025

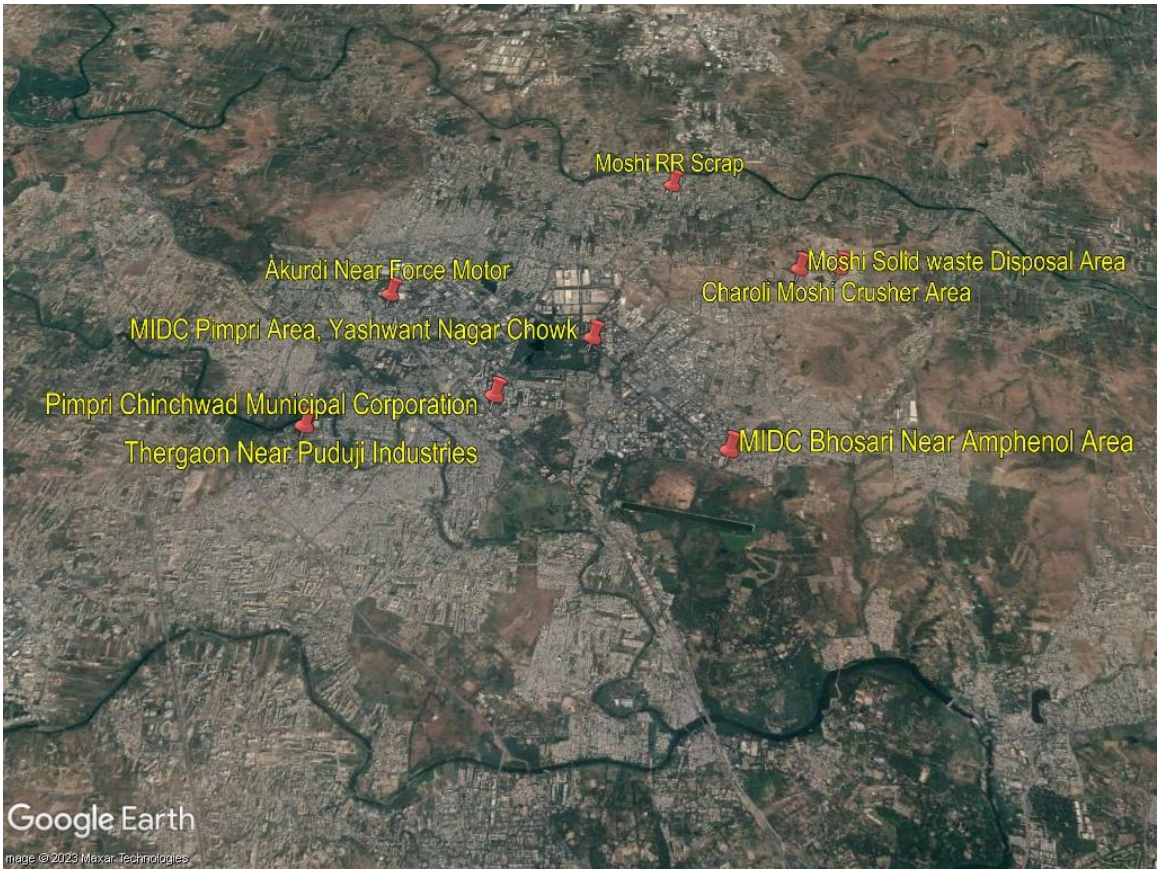


Fig: Geographical Locations of Ambient Air Quality Monitoring

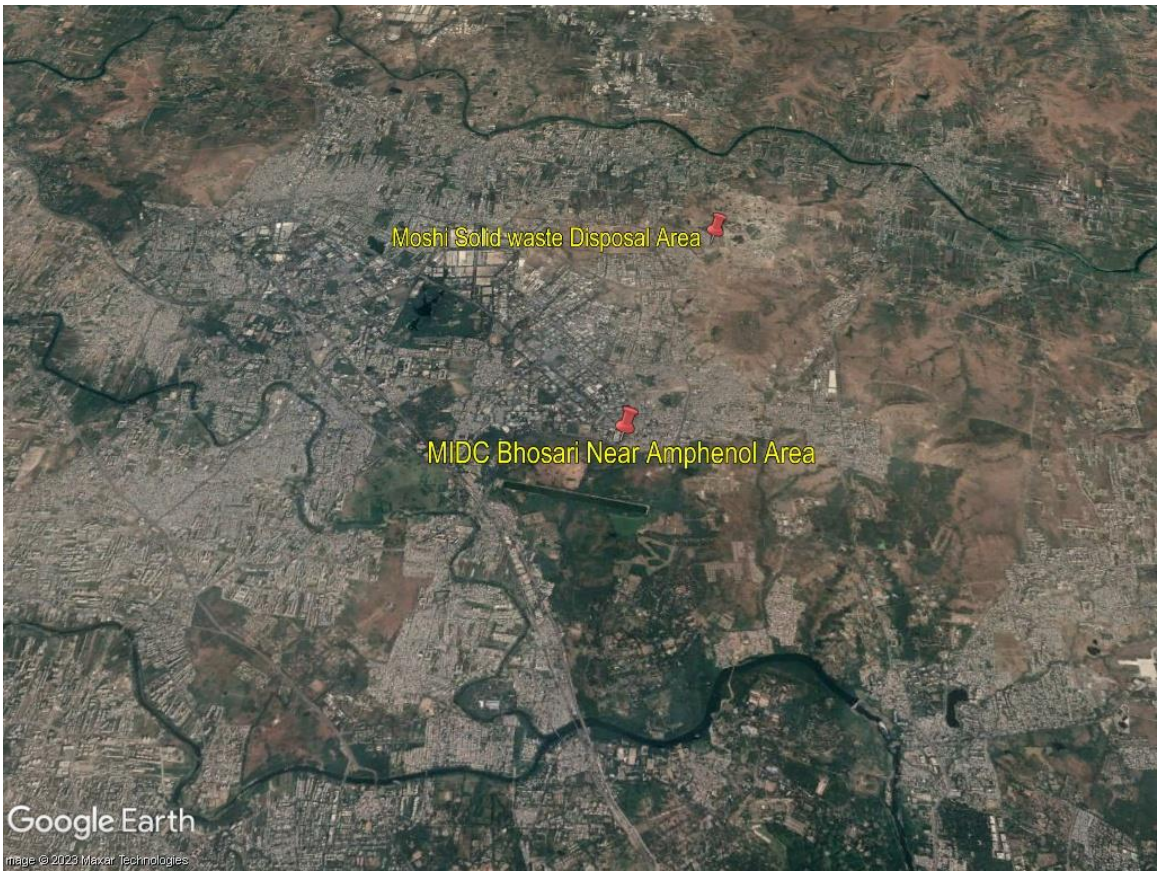


Fig: Geographical Locations of VOCs Monitoring

Table 5.3 Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Thergaon Near Puduji Industries	Akurdi Near Force Motor	Pimpri Chinchwad Municipal Corporation	MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
Sulphur Dioxide (SO_2)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	98	89	87	58
Particulate Matter (size less than 10 µm) or PM_{10}	$\mu g/m^3$	63	57	64	68
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	$\mu g/m^3$	15	15	17	17
Ozone (O_3)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m^3	1.43	1.35	1.53	1.37

Parameters	Unit	Results			
		Thergaon Near Puduji Industries	Akurdi Near Force Motor	Pimpri Chinchwad Municipal Corporation	MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
Carbon Monoxide (CO) (8 h)	mg/m^3	1.83	1.76	1.84	1.78
Ammonia (NH_3)	$\mu g/m^3$	37.2	110.1	46.2	47.9
Benzene (C_6H_6)	ng/m^3	3.0	2.5	1.9	2.2
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m^3	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m^3	BLQ	BLQ	0.313	0.327
Nickel (Ni)	ng/m^3	BLQ	BLQ	BLQ	BLQ

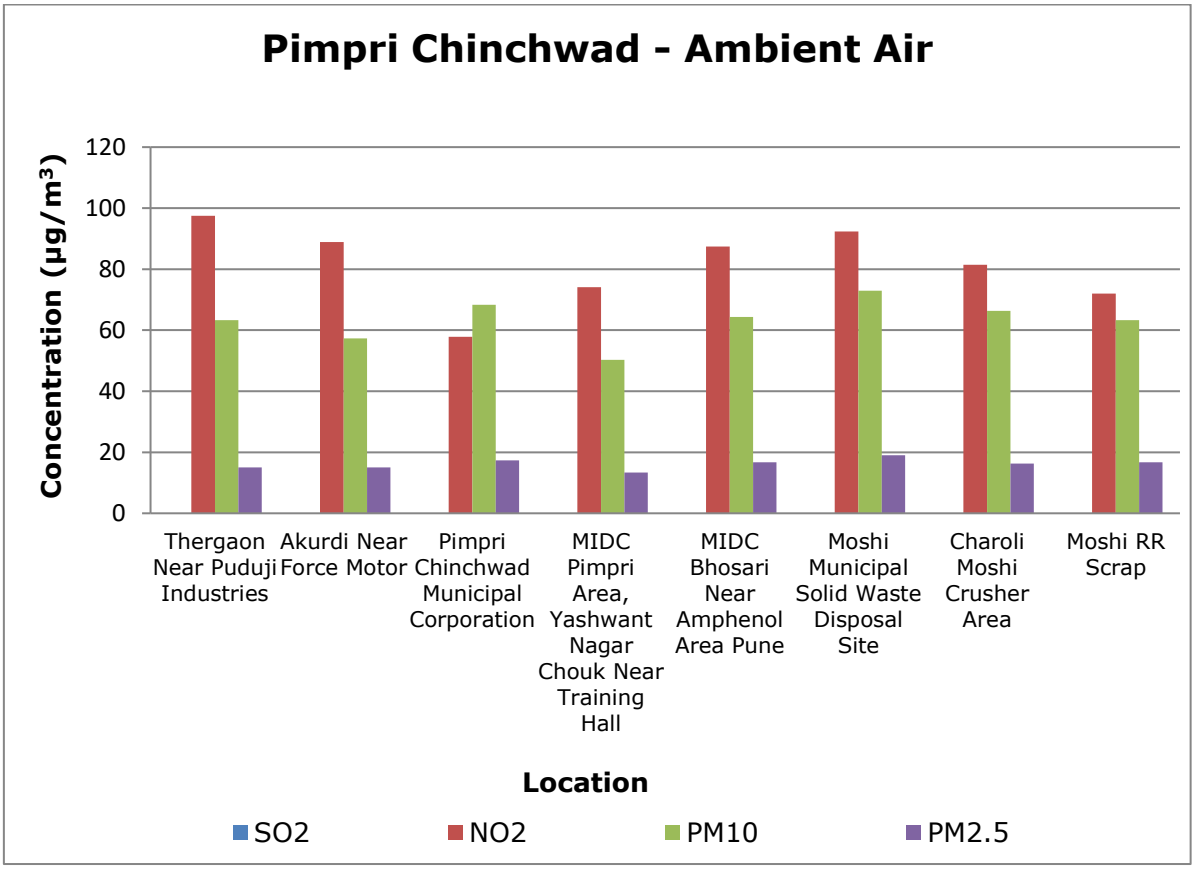
Parameters	Unit	Results			
		MIDC Bhosari Near Amphenol Area Pune	Moshi Municipal Solid Waste Disposal Site	Charoli Moshi Crusher Area	Moshi RR Scrap
Sulphur Dioxide (SO_2)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	74	92	81	72
Particulate Matter (size less than 10 µm) or PM_{10}	$\mu g/m^3$	50	73	66	63
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	$\mu g/m^3$	13	19	16	17
Ozone (O_3)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m^3	1.37	1.40	1.39	1.43
Carbon Monoxide (CO) (8 h)	mg/m^3	1.63	1.76	1.69	1.66
Ammonia (NH_3)	$\mu g/m^3$	27.0	27	BLQ	BLQ
Benzene (C_6H_6)	$\mu g/m^3$	2.4	2.3	2.6	2.6
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m^3	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m^3	BLQ	BLQ	BLQ	BLQ
Nickel (Ni)	ng/m^3	BLQ	BLQ	BLQ	BLQ

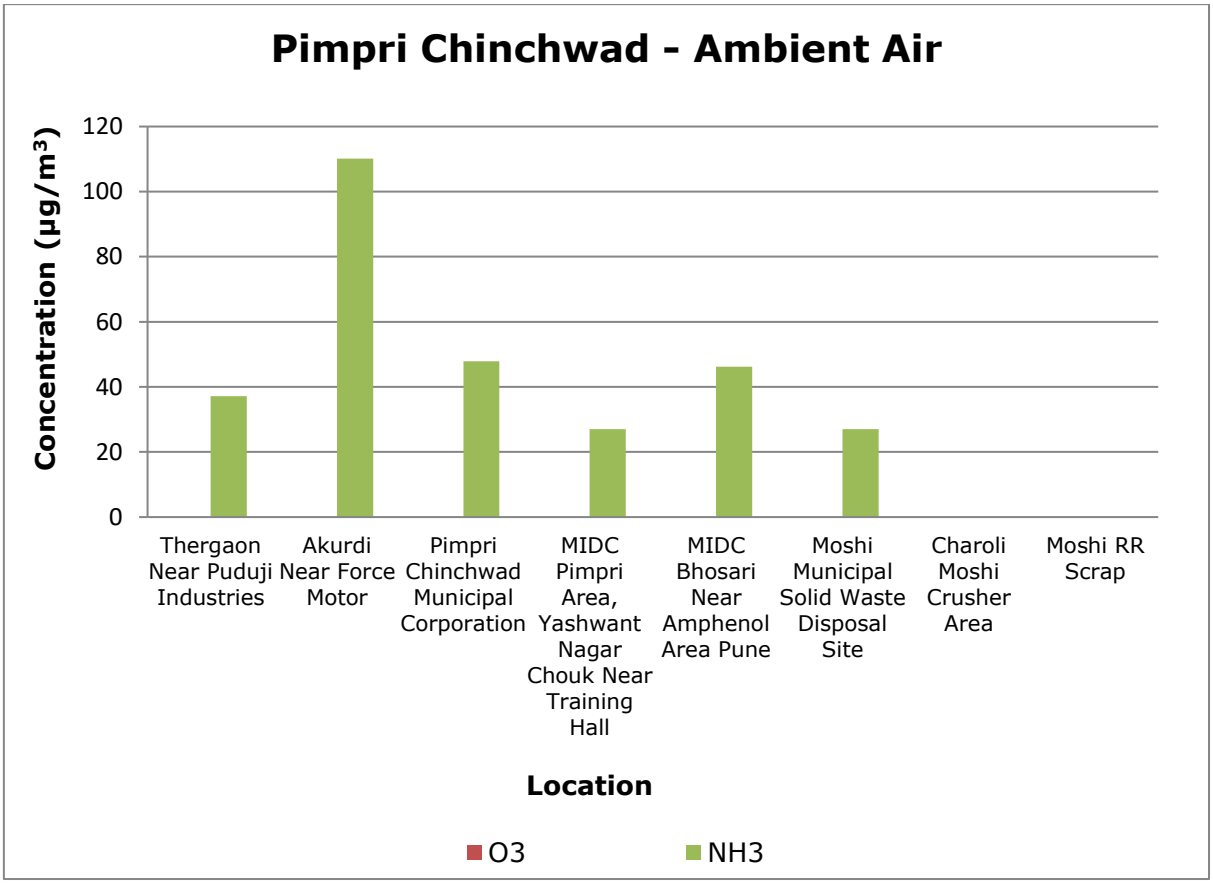
Table 5.4 Volatile Organic Compounds (VOCs) in Ambient Air Results

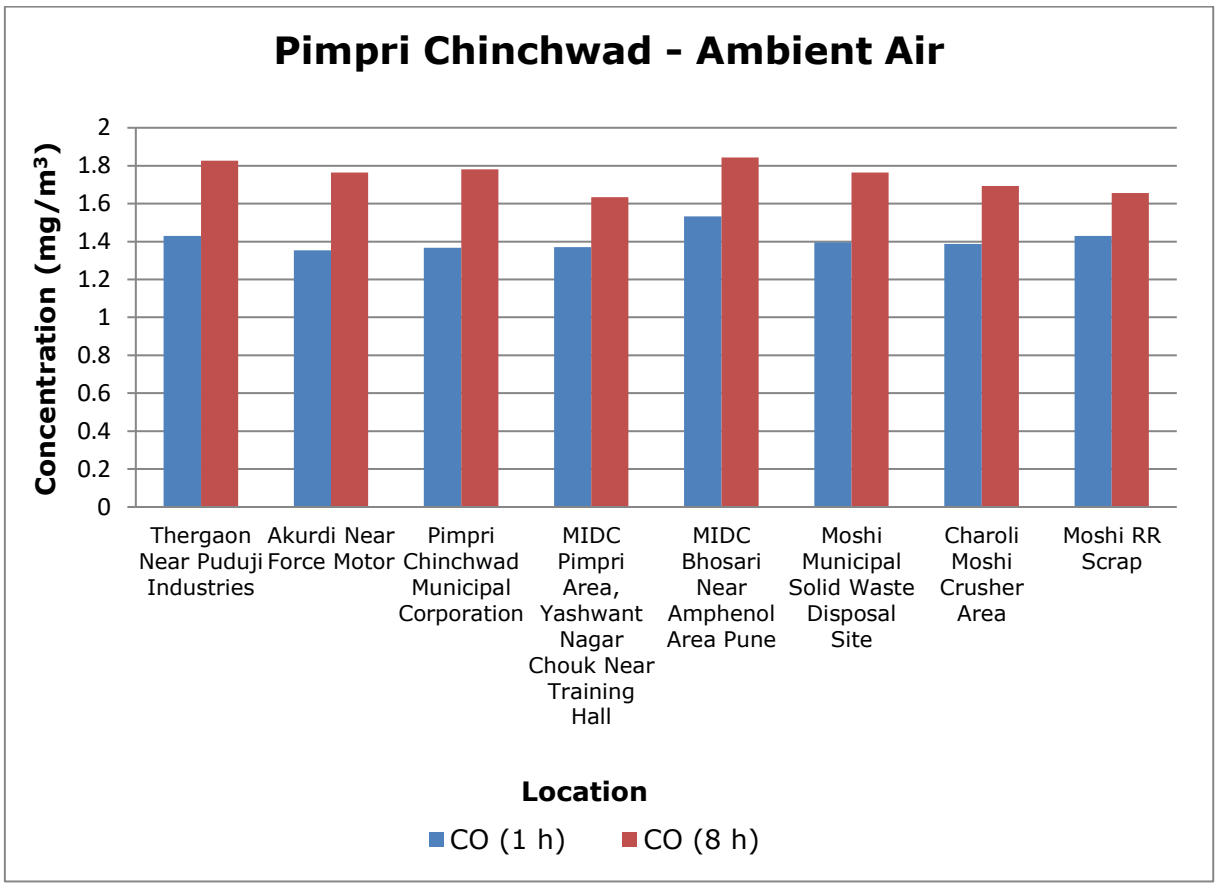
Parameters	Unit	Results	
		MIDC Bhosari Near Amphenol Area Pune	Moshi Municipal Solid Waste Disposal Site
Chloroform	µg/m³	0.7	9.89
Carbon Tetrachloride	µg/m³	0.5	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	6.93
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
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
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	0.612
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	0.5	0.732
1,2-Dichloropropane	µg/m³	BLQ	BLQ

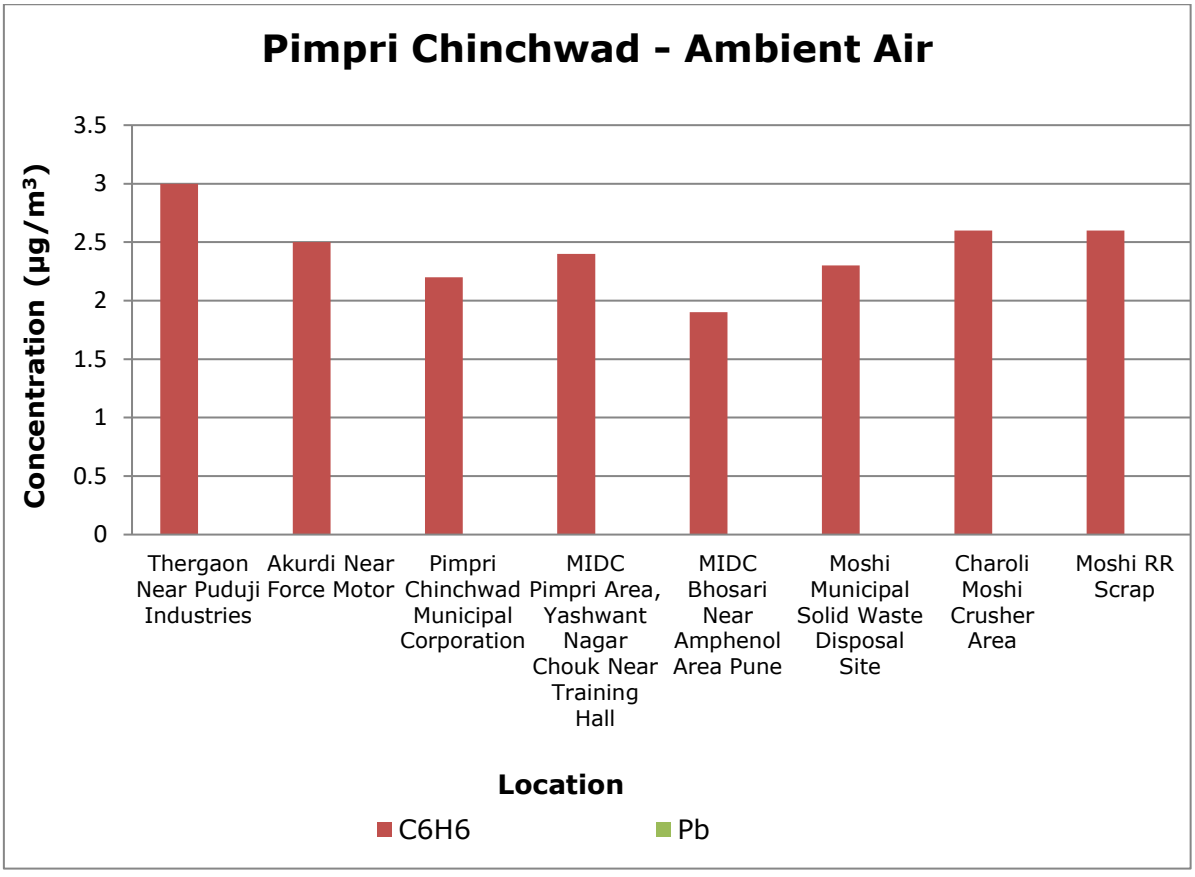
Parameters	Unit	Results	
		MIDC Bhosari Near Amphenol Area Pune	Moshi Municipal Solid Waste Disposal Site
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	0.5	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	0.526
N-Butylbenzene	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
Dibromoethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.6	0.95
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	3.56
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

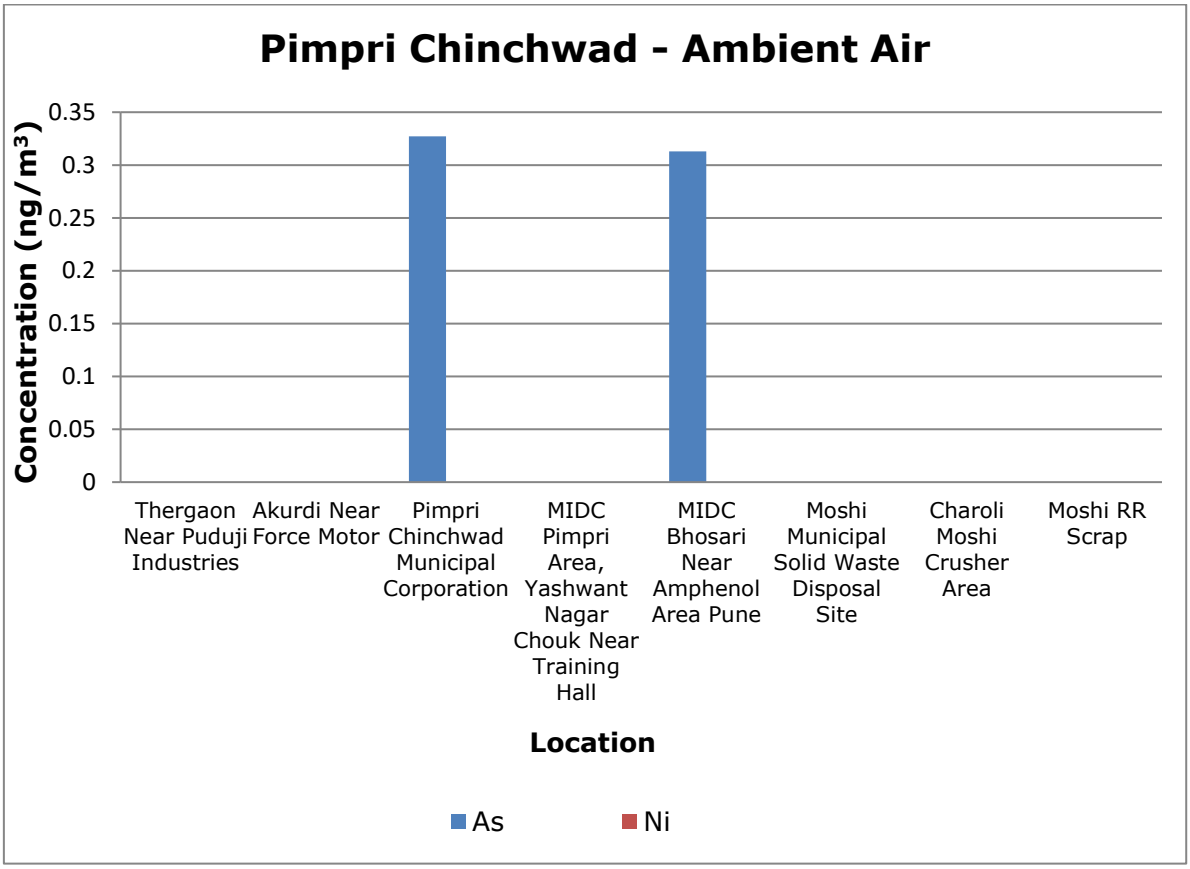
Graphs - Ambient Air Quality Monitoring






Pimpri Chinchwad - Ambient Air
Concentration (mg/m³)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Thergaon Near Puduji Industries
Akurdi Near Force Motor
Pimpri Chinchwad Municipal Corporation
MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
MIDC Bhosari Near Amphenol Area Pune
Moshi Municipal Solid Waste Disposal Site
Charoli Moshi Crusher Area
Moshi RR Scrap
Location
CO (1 h)
CO (8 h)


Pimpri Chinchwad - Ambient Air
Concentration (µg/m³)
3.5
3
2.5
2
1.5
1
0.5
0
Thergaon Near Puduji Industries
Akurdi Near Force Motor
Pimpri Chinchwad Municipal Corporation
MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
MIDC Bhosari Near Amphenol Area Pune
Moshi Municipal Solid Waste Disposal Site
Charoli Moshi Crusher Area
Moshi RR Scrap
Location
C6H6
Pb


Pimpri Chinchwad - Ambient Air
Concentration (ng/m³)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Thergaon Near Puduji Industries
Akurdi Near Force Motor
Pimpri Chinchwad Municipal Corporation
MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
MIDC Bhosari Near Amphenol Area Pune
Moshi Municipal Solid Waste Disposal Site
Charoli Moshi Crusher Area
Moshi RR Scrap
Location
As
Ni

WATER ENVIRONMENT

6. Water Environment

For studying the water environment of Pimpri-Chinchwad area, six samples of Surface water were collected from different industries.

- All six water samples collected are found acceptable in sanitary survey, smell and Colour is observed in acceptable limit.
- General parameters like pH, electrical conductivity, suspended solids and total dissolved solids. are also observed well within the limits in all the samples.
- In fish bioassay 100% survival of fishes was observed in one location out of six location.
- All metals like Nickel, Hexavalent Chromium (Cr^{6+}), Total Chromium, Total Arsenic, Lead, Cadmium, Mercury, Vanadium, Zinc, Selenium, etc. are also observed either below the limit of quantification or below their standard limits.
- Parameters like Cyanide, Sulphide, Fluoride, Total Ammonia and Phenolic compounds are found within acceptable limit.
- Total Phosphate, Total Kjeldahl Nitrogen and Iron observed above the standard limits.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are also observed below the detectable limit in all the studied samples.

Table 6.1 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.	Pawana River-Chinchwad	18°62'42.41"N	73°76'88.62"E	21.01.2025	23.01.2025	25.01.2025
2.	Pawana River-Ravet	18°64'08.31"N	73°74'72.67"E	21.01.2025	23.01.2025	25.01.2025
3.	Indrayani River - Chikhali	18°65'51.44"N	73°81'87.27"E	21.01.2025	23.01.2025	25.01.2025
4.	Indrayani River – Moshi Bridge	18°68'84.5"N	73°84'56.27"E	21.01.2025	23.01.2025	25.01.2025
5.	Pawana River-Pimpri	18°62'32.06"N	73°78'85.44"E	21.01.2025	23.01.2025	25.01.2025
6.	Pawana River-Kasarwadi	18°60'21.78"N	73°82'17.1"E	21.01.2025	23.01.2025	25.01.2025

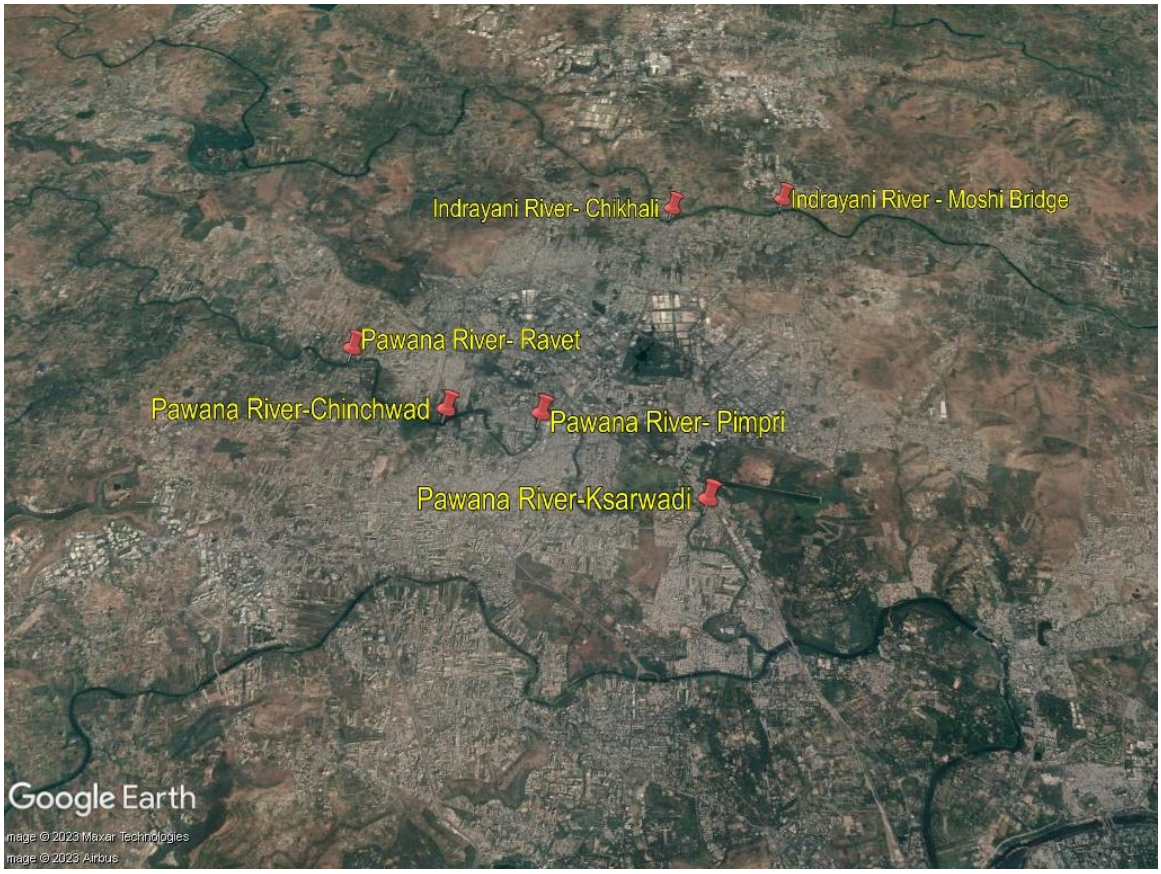


Fig: Geographical Locations of Surface Water Sampling

Table 6.2 Results of Surface Water

Parameters	Unit	Results		
		Pawana River- Chinchwad	**Pawana River- Ravet**	**Indrayani River- Chikhali**
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Generally Clean neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	No Floating Matter
Transparency	m	0.32	1.04	0.56
Temperature	^{o}C	26	25	27
Colour	Hazen	17	1	1
Smell	-	Not agreeable	Agreeable	Agreeable
pH	-	7.37	7.53	7.57
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	67	22	36
Total Dissolved Solids	mg/L	330	65	214
Dissolved Oxygen (% Saturation)	%	58	71	59
Chemical Oxygen Demand	mg/L	89	24	48

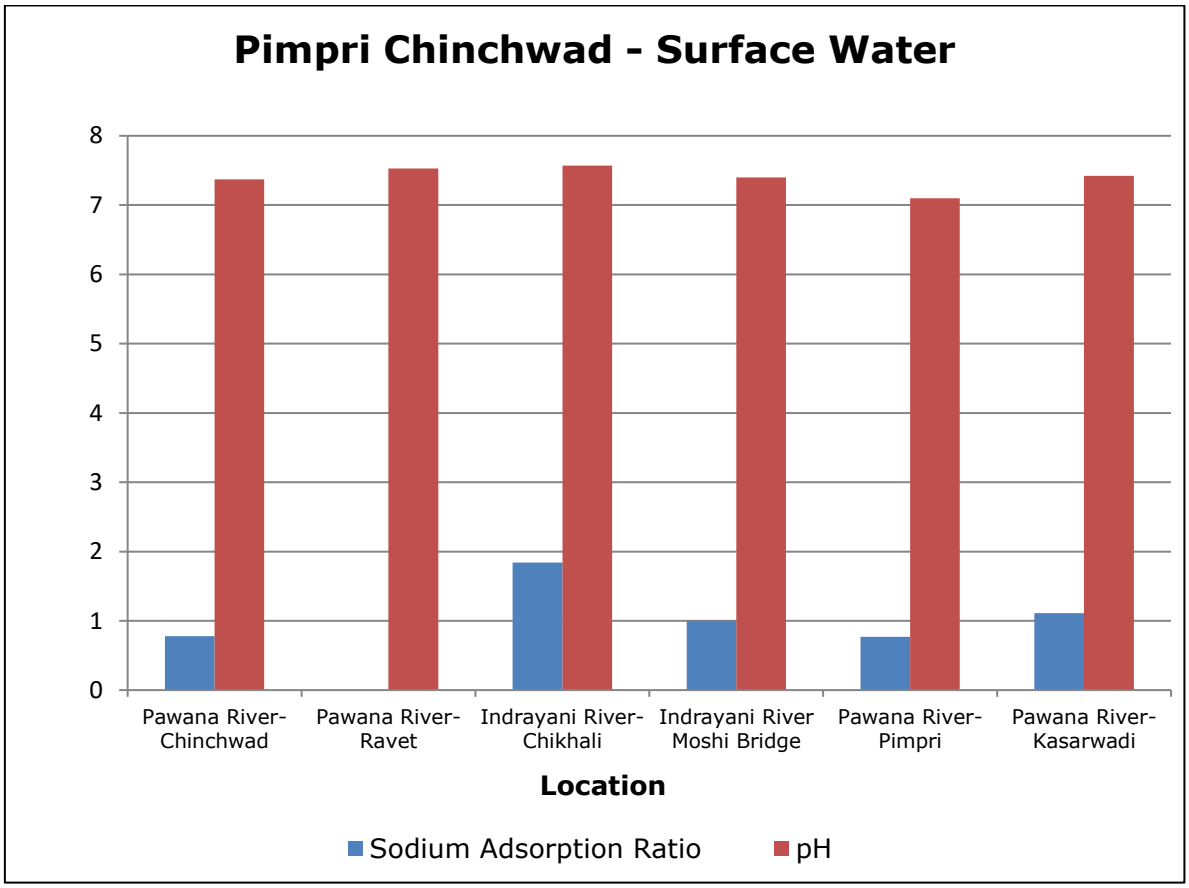
Parameters	Unit	Results		
		Pawana River- Chinchwad	Pawana River- Ravet	Indrayani River- Chikhali
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	25	6	13
Electrical Conductivity (at 25°C)	µmho/cm	590	116	382
Nitrite Nitrogen	mg/L	0.03	0.02	0.05
Nitrate Nitrogen	mg/L	1.61	0.29	0.73
(NO_2 + NO_3)-Nitrogen	mg/L	1.63	0.29	0.75
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Free Residual Chlorine	mg/L	0.21	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.49	BLQ	0.31
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.15	BLQ	BLQ
Sodium Adsorption Ratio	-	0.78	BLQ	1.84
Total Coliforms	MPN Index/ 100 ml	5713	46040	3795
Faecal Coliforms	MPN Index/ 100 ml	1170	27011	3725
Total Phosphate (as P)	mg/L	0.33	BLQ	BLQ
Total Kjeldahl Nitrogen (as N)	mg/L	3.84	1.20	0.52
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	1.01	0.135	0.23
Total Nitrogen	mg/L	5.49	1.10	1.46
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	0.00016	BLQ	0.00011
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	0.055
Nickel (as Ni)	mg/L	0.015	0.015	0.015
Copper (as Cu)	mg/L	0.029	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.0245	0.024	0.025
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.012	BLQ	0.01
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ

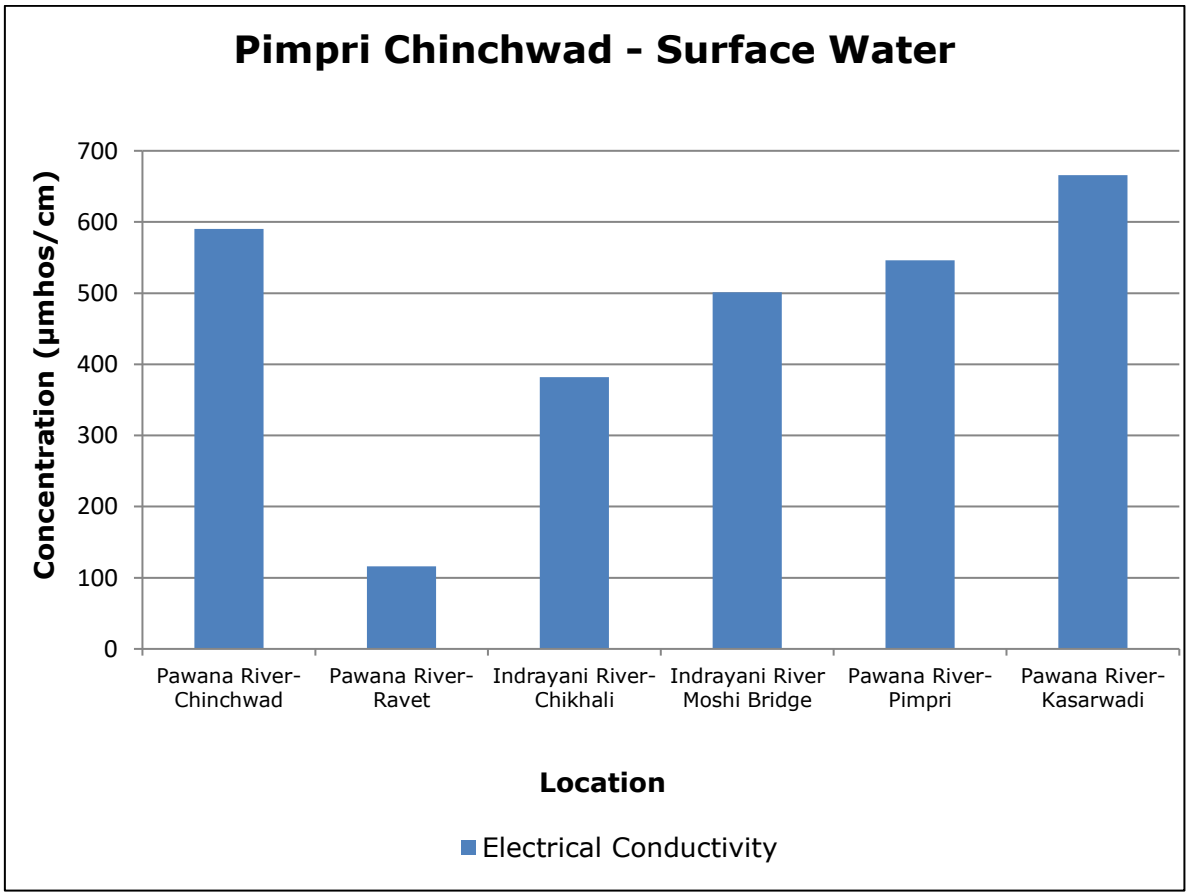
Parameters	Unit	Results		
		Pawana River- Chinchwad	Pawana River- Ravet	Indrayani River- Chikhali
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.119	0.062	0.136
Iron (as Fe)	mg/L	0.188	0.208	0.286
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	97	100	90

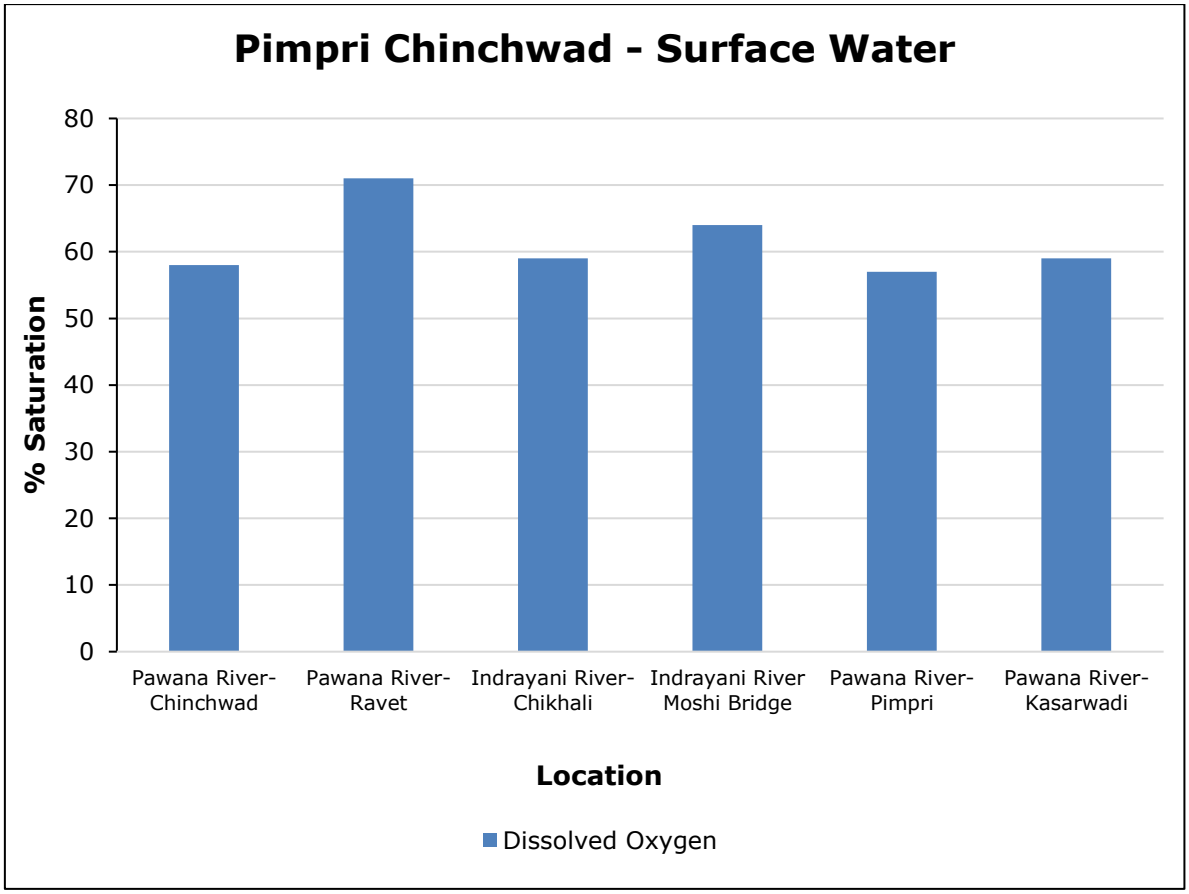
Parameters	Unit	Results		
		Indrayani River – Moshi Bridge	Pawana River- Pimpri	Pawana River- Kasarwadi
Sanitary Survey	-	Generally Clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.51	0.31	0.49
Temperature	^oC	28	26	28
Colour	Hazen	1	9	2
Smell	-	Not Agreeable	Not Agreeable	Not Agreeable
pH	-	7.40	7.10	7.42
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	51	57	46
Total Dissolved Solids	mg/L	317	305	373
Dissolved Oxygen (% Saturation)	%	64	57	59
Chemical Oxygen Demand	mg/L	42	52	49
Biochemical Oxygen Demand (3 days, 27^oC)	mg/L	11	14	14
Electrical Conductivity (at 25^oC)	µmho/cm	501	546	666
Nitrite Nitrogen	mg/L	0.03	0.03	0.03
Nitrate Nitrogen	mg/L	2.00	2.56	2.65
(NO_2 + NO_3)-Nitrogen	mg/L	2.02	2.60	2.68
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Free Residual Chlorine	mg/L	BLQ	BLQ	0.16
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.40	0.38	0.47
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ

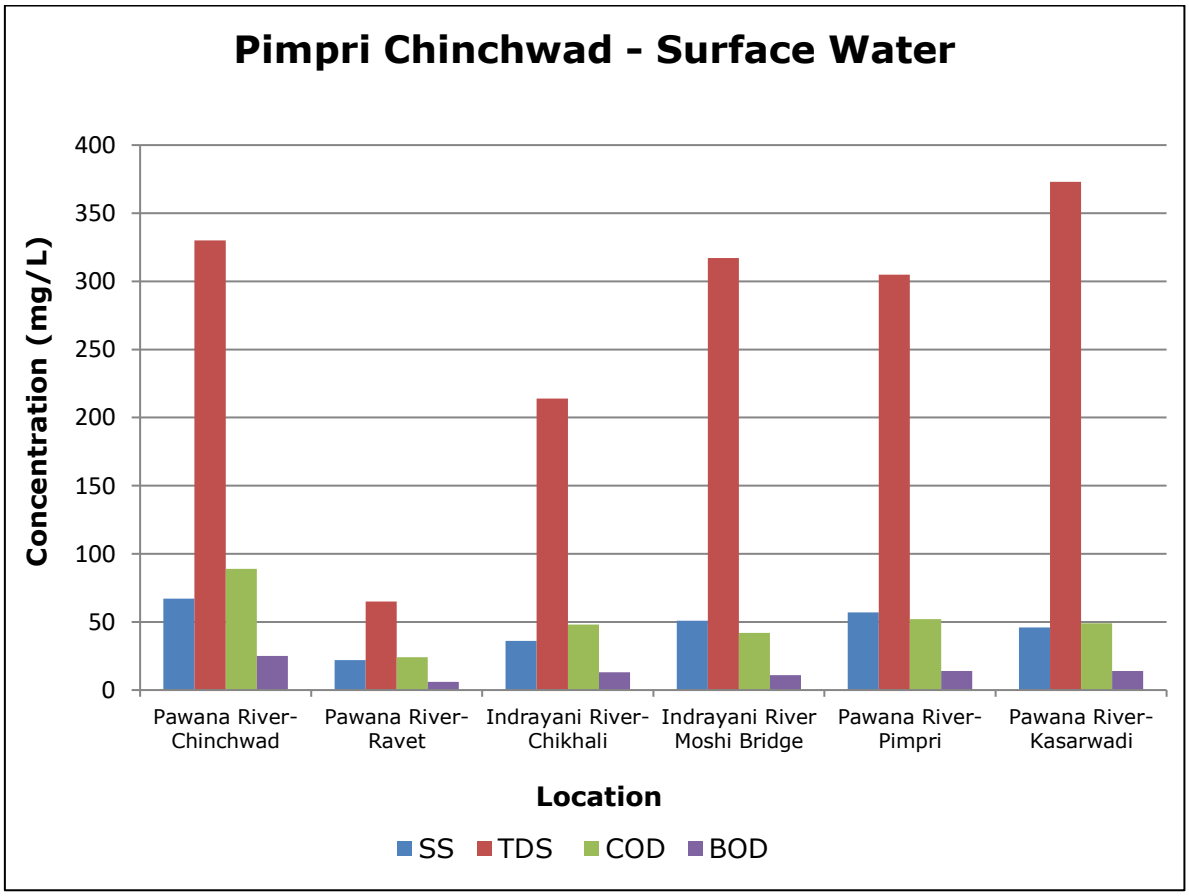
Parameters	Unit	Results		
		Indrayani River – Moshi Bridge	Pawana River- Pimpri	Pawana River- Kasarwadi
Dissolved Phosphate (as P)	mg/L	BLQ	0.12	0.16
Sodium Adsorption Ratio	-	1	0.77	1.11
Total Coliforms	MPN Index/ 100 ml	1930	14749	7667
Faecal Coliforms	MPN Index/ 100 ml	1172	11698	176
Total Phosphate (as P)	mg/L	0.23	0.27	0.25
Total Kjeldahl Nitrogen (as N)	mg/L	5.03	1.25	2.05
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.39	0.62	0.96
Total Nitrogen	mg/L	7.04	3.87	4.66
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	µg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	mg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	0.00013	0.00030	0.00020
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.10	0.10
Nickel (as Ni)	mg/L	0.022	0.018	0.034
Copper (as Cu)	mg/L	0.025	0.029	0.78
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.025	0.076	0.070
Total Arsenic (as As)	mg/L	BLQ	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	0.189	0.212	0.22
Iron (as Fe)	mg/L	0.476	0.622	0.87
Vanadium (as V)	mg/L	BLQ	0.012	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	73	80	70

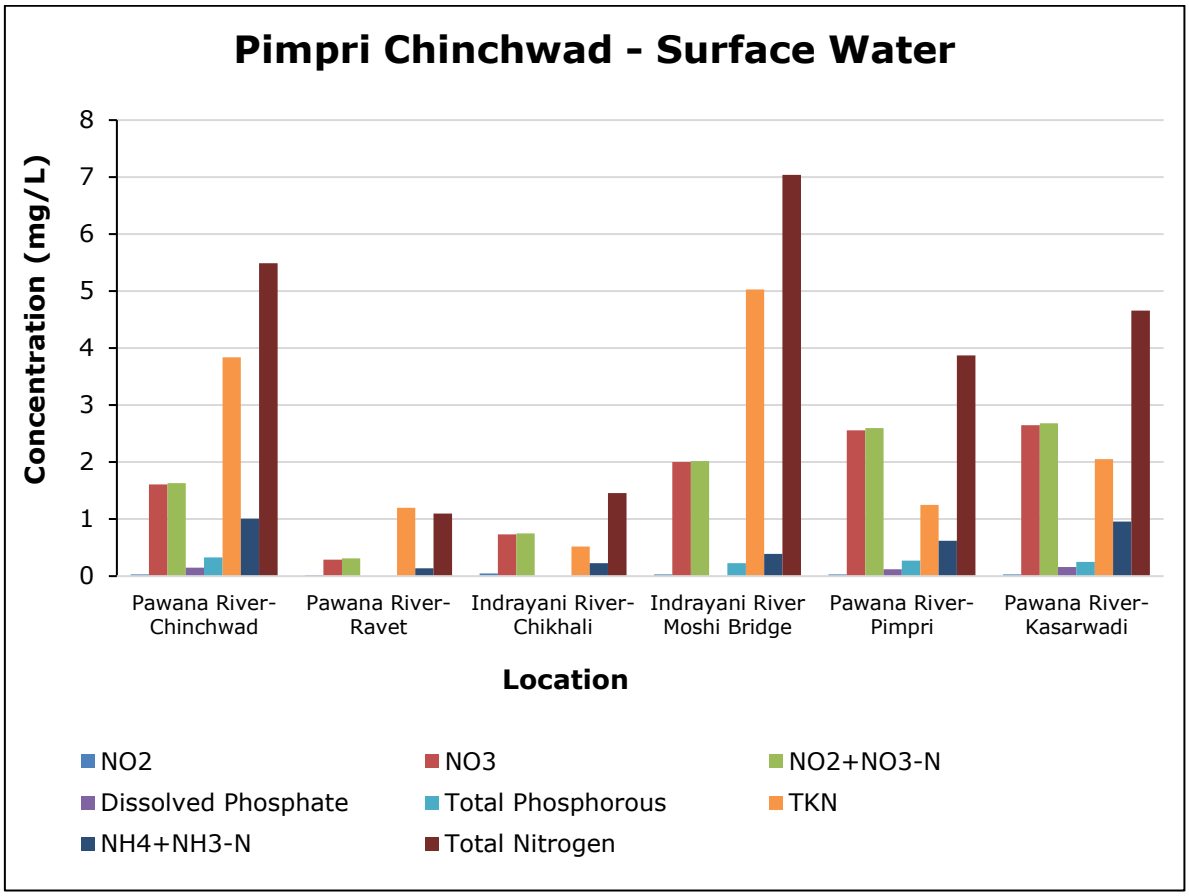
Graphs - Surface Water Quality

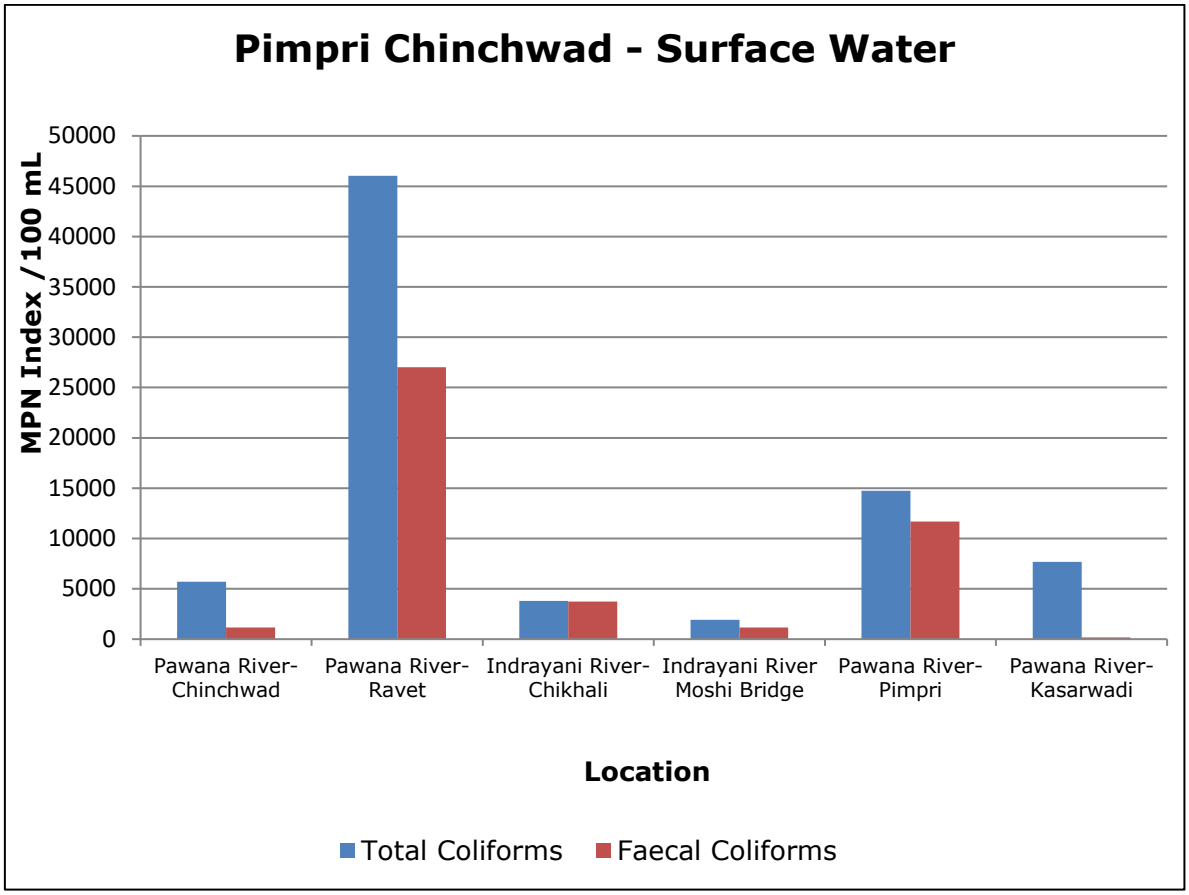


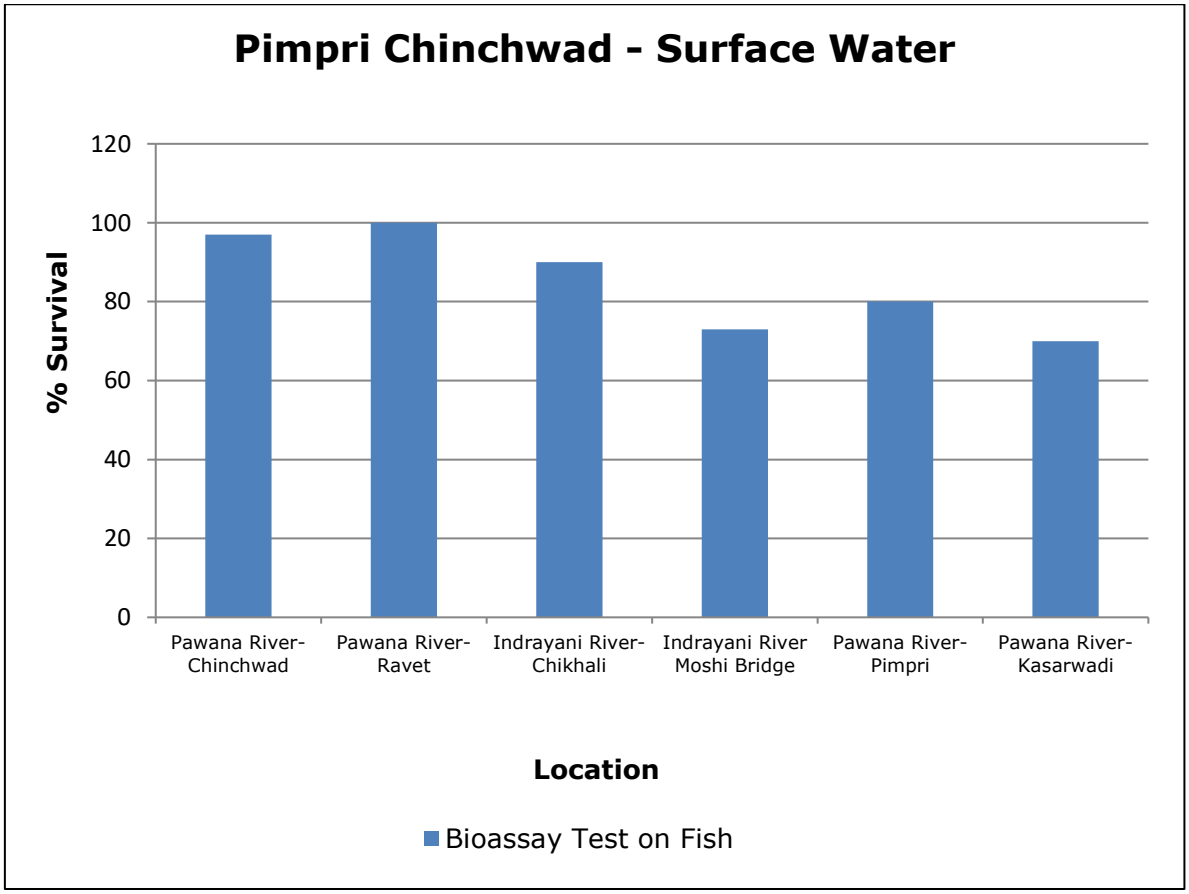



Pimpri Chinchwad - Surface Water
80
70
60
50
40
30
20
10
0
% Saturation
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
Dissolved Oxygen


Pimpri Chinchwad - Surface Water
400
350
300
250
200
150
100
50
0
Concentration (mg/L)
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
SS
TDS
COD
BOD


Pimpri Chinchwad - Surface Water
Concentration (mg/L)
8
7
6
5
4
3
2
1
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
NO2
NO3
NO2+NO3-N
Dissolved Phosphate
Total Phosphorous
TKN
NH4+NH3-N
Total Nitrogen


Pimpri Chinchwad - Surface Water
MPN Index /100 mL
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
Total Coliforms
Faecal Coliforms


Pimpri Chinchwad - Surface Water
% Survival
120
100
80
60
40
20
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
Bioassay Test on Fish

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Pimpri-Chinchwad area, 6 ground water samples were collected from Borewell, Open well and Hand pump.

- All the water samples collected are found acceptable in general appearance, colour and smell.
- General parameters like pH, suspended solids, COD and Total Kjeldahl Nitrogen (TKN) are also observed well within the limits in all the collected samples.
- Concentration of BOD is found higher than the standard limits in two water samples.
- All metals like Zinc, Arsenic, Nickel, Copper, Total Chromium, Lead, Cadmium, Mercury, Selenium, etc. are also observed either below the limit of quantification or below their standard limits.
- Parameters like Total Phosphate, Hexavalent Chromium (Cr^{6+}) Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds also meet the criteria as prescribed by CPCB.
- Concentration of Iron is found higher than the standard limits in two water samples.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the detectable limit in all studied samples.

Table 7.1 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.	Patil Niwas Near Keshav Nagar School Chinchwad Gaon	18°62'47.65"N	73°78'13.17"E	21.01.2025	23.01.2025	25.01.2025
2.	Rohit Park-I Tapkir Nagar Kalewadi	18°61'04.59"N	73°78'63.11"E	21.01.2025	23.01.2025	25.01.2025
3.	Near Kashiba Shinde Sabhagruha Pimprigaon	18°61'05.16"N	73°79'74.63"E	21.01.2025	23.01.2025	25.01.2025
4.	Near Saritakunj Building Kasadwadi	18°60'15.7"N	73°82'18.63"E	21.01.2025	23.01.2025	25.01.2025
5.	Sai Dham Landewadi Bhosari	18°61'97.68"N	73°84'34.23"E	21.01.2025	23.01.2025	25.01.2025

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
6.	Gandharve Nagari Moshi	18°66'06.2"N	73°84'94.91"E	21.01.2025	23.01.2025	25.01.2025

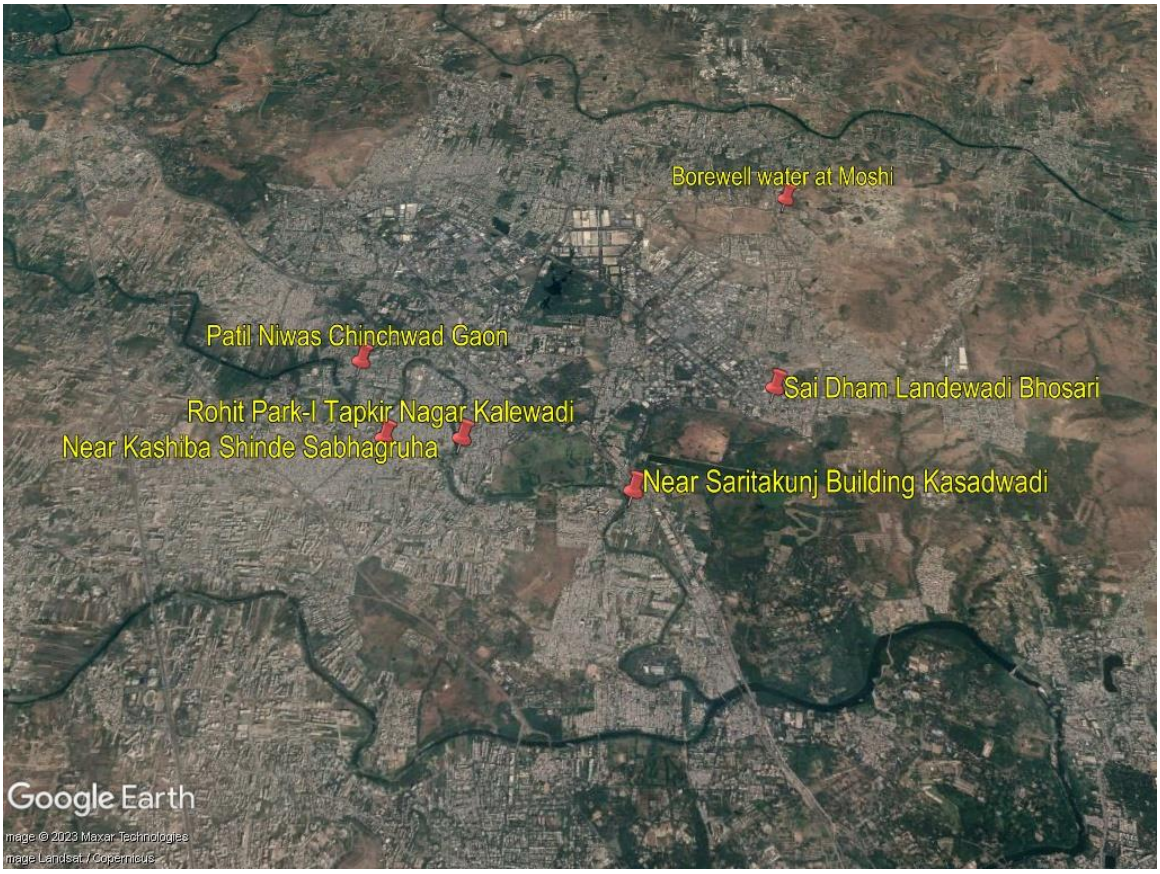


Fig: Geographical Locations of Ground Water Sampling

Table 7.2 Results of Ground Water

Parameters	Unit	Results		
		Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Rohit Park-I Tapkir Nagar Kalewadi	Near Kashiba Shinde Sabhagruha Pimprigaon
Sanitary Survey	-	Generally clean neighborhood	Generally clean neighborhood	Generally clean neighborhood
General Appearance	-	No floating matter	No floating matter	No floating matter
Transparency	M	0.2	0.2	0.2
Temperature	°C	26	26	27
Colour	Hazen	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable

Parameters	Unit	Results		
		Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Rohit Park-I Tapkir Nagar Kalewadi	Near Kashiba Shinde Sabhagruha Pimprigaon
pH	-	7.73	7.71	7.93
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	11	7	11
Total Dissolved Solids	mg/L	408	406	533
Chemical Oxygen Demand	mg/L	30	22	36
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	8	6	10
Electrical Conductivity (at 25 °C)	µmhos/cm	729	725	953
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	BLQ	BLQ
Nitrate Nitrogen (as NO_3)	mg/L	1.01	1.64	2.63
(NO_2 + NO_3)-Nitrogen	mg/L	1.01	1.64	2.64
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	0.49	0.49	0.53
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.1	0.11	0.13
Sodium Adsorption Ratio	-	1.62	0.89	1.36
Total Coliforms	MPN Index/100 ml	<1.8	20	4.5
Faecal Coliforms	MPN Index/100 ml	<1.8	13	4.5
Total Phosphate (as P)	mg/L	0.19	0.18	0.23
Total Kjeldahl Nitrogen	mg/L	2.42	1.91	2.12
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	BLQ	BLQ
Total Nitrogen	mg/L	3.39	3.54	4.78
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS, Calculated as LAS, mol.wt. 288.38)	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	0.125

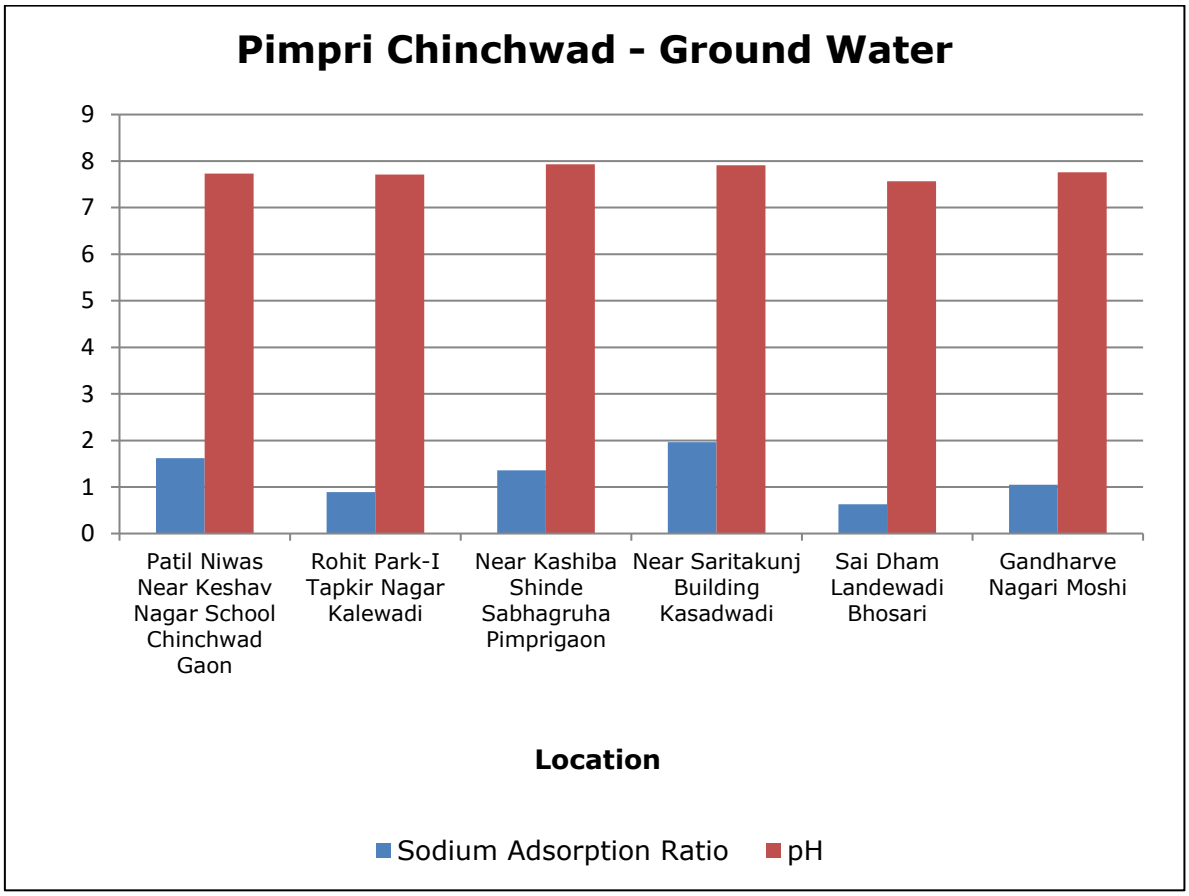
Parameters	Unit	Results		
		Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Rohit Park-I Tapkir Nagar Kalewadi	Near Kashiba Shinde Sabhagruha Pimprigaon
Nickel (as Ni)	mg/L	0.0155	0.0175	0.021
Copper (as Cu)	mg/L	0.13	BLQ	0.022
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.023	0.0235	0.034
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.009	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.029	0.026	0.190
Iron (as Fe)	mg/L	0.226	0.150	0.203
Vanadium (as V)	mg/L	BLQ	0.046	0.059
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	0.147
Bioassay Test on fish	% survival	97	100	100

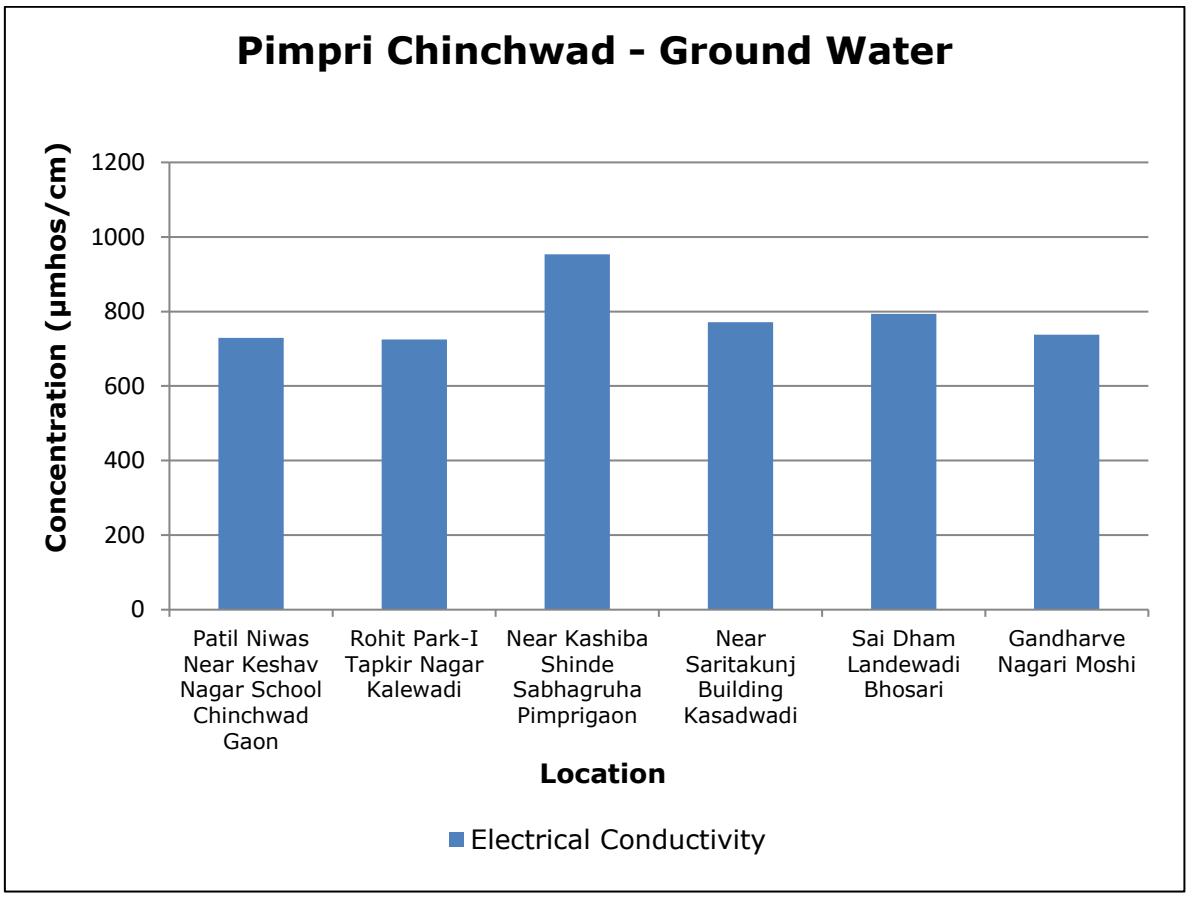
Parameters	Unit	Results		
		Near Saritakunj Building Kasadwadi	Sai Dham Landewadi Bhosari	Gandharve Nagari Moshi
Sanitary Survey	-	Generally clean neighborhood	Generally clean neighborhood	Generally clean neighborhood
General Appearance	-	No floating matter	No floating matter	No floating Matter
Transparency	M	Not Applicable	Not Applicable	Not Applicable
Temperature	^oC	0.2	0.2	0.2
Colour	Hazen	27	28	27
Smell	-	1	1	1
pH	-	Agreeable	Agreeable	Agreeable
Oil & Grease	mg/L	7.91	7.57	7.76
Total Suspended Solids	mg/L	BLQ	BLQ	BLQ
Total Dissolved Solids	mg/L	15	18	9
Chemical Oxygen Demand	mg/L	34	21	28
Biochemical Oxygen Demand (3 days, 27^oC)	mg/L	9	5	7
Electrical Conductivity (at 25 ^oC)	µmhos/cm	771	794	738

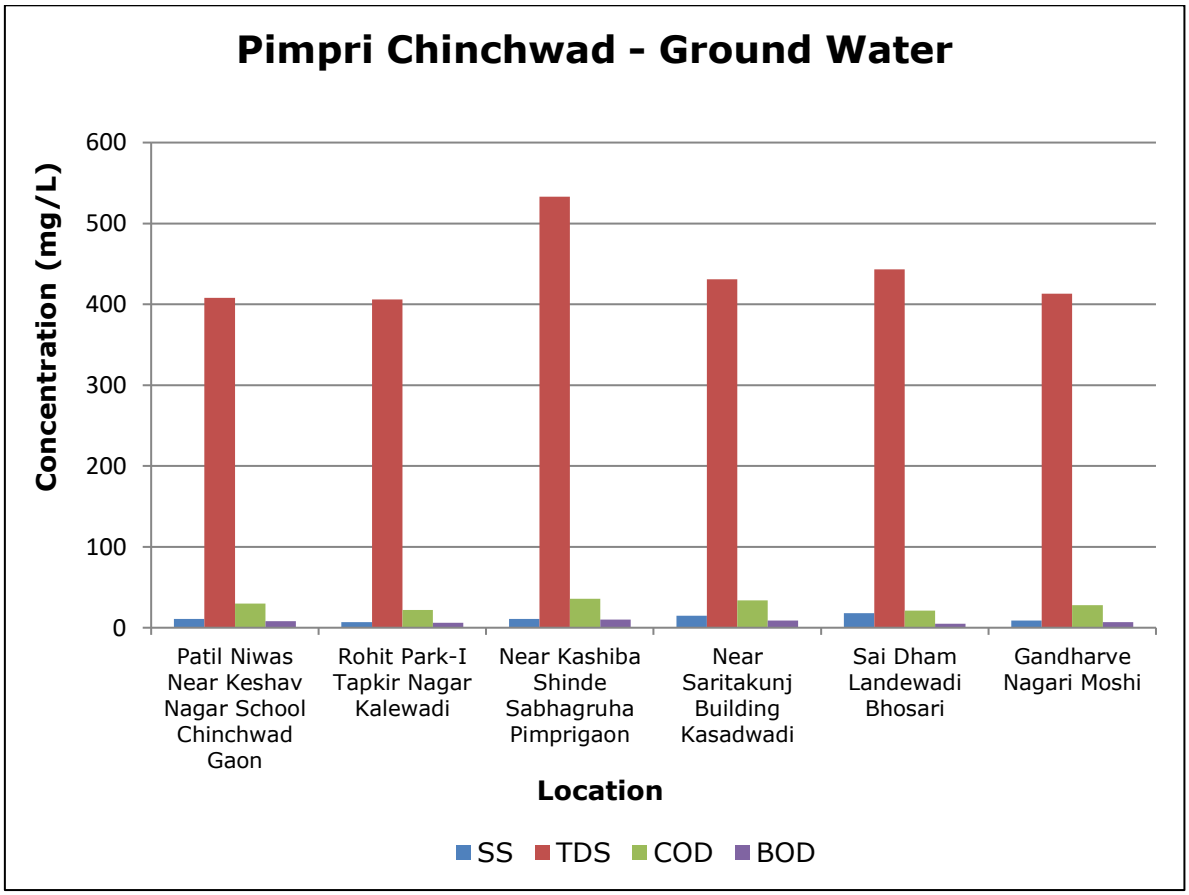
Parameters	Unit	Results		
		Near Saritakunj Building Kasadwadi	Sai Dham Landewadi Bhosari	Gandharve Nagari Moshi
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	BLQ	BLQ
Nitrate Nitrogen (as NO_3)	mg/L	0.36	1.47	1.81
(NO_2 + NO_3)-Nitrogen	mg/L	0.36	1.47	1.81
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.52	0.52	0.53
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	0.11	0.17
Sodium Adsorption Ratio	-	1.96	0.63	1.05
Total Coliforms	MPN Index/100 ml	18.0	67	3191
Faecal Coliforms	MPN Index/100 ml	18.0	40	63
Total Phosphate (as P)	mg/L	0.21	0.20	0.28
Total Kjeldahl Nitrogen	mg/L	3.05	2.32	1.82
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	BLQ	BLQ
Total Nitrogen	mg/L	4.57	3.73	3.60
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS, Calculated as LAS, mol.wt. 288.38)	µg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	mg/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	0.058	BLQ	BLQ
Nickel (as Ni)	mg/L	0.0195	0.023	0.017
Copper (as Cu)	mg/L	0.023	0.025	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.026	0.03	0.026
Total Arsenic (as As)	mg/L	BLQ	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	0.314	0.059	0.046

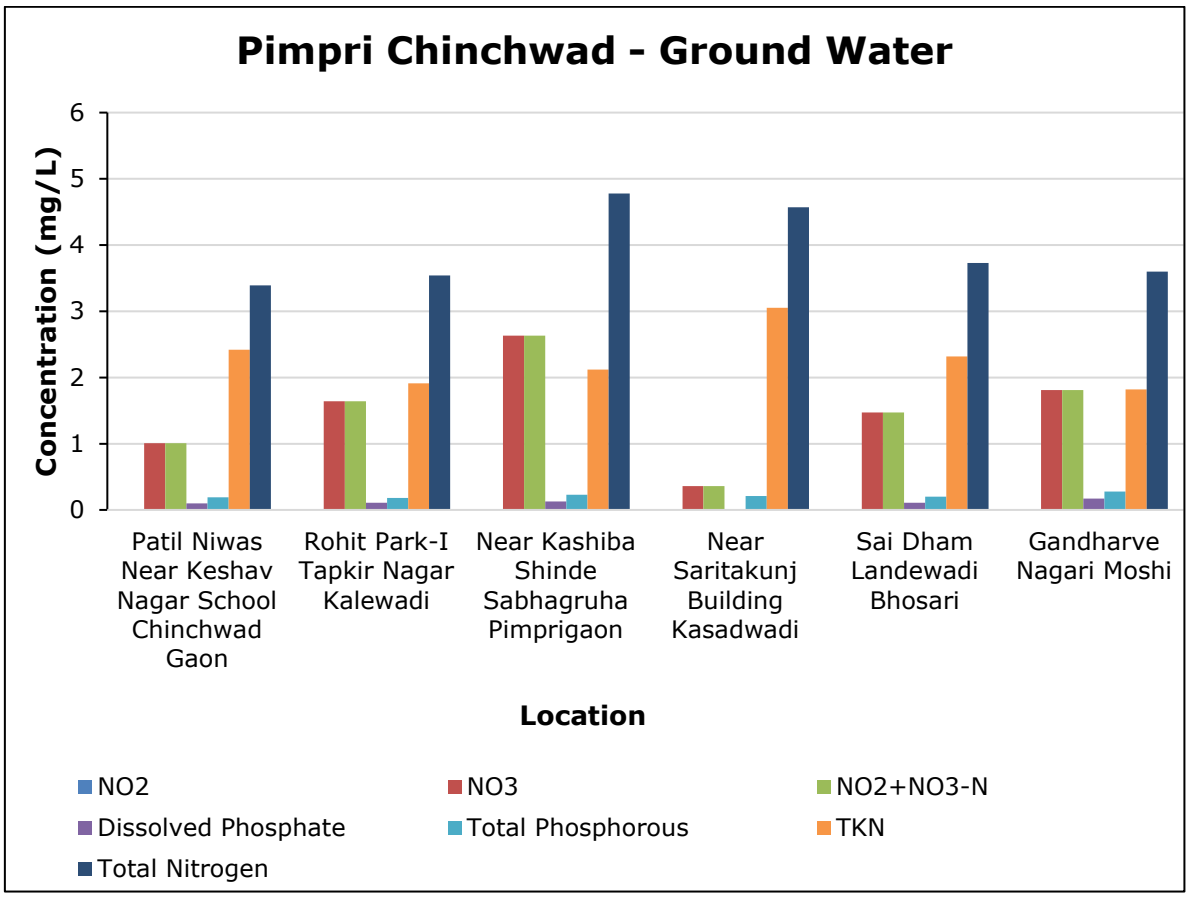
Parameters	Unit	Results		
		Near Saritakunj Building Kasadwadi	Sai Dham Landewadi Bhosari	Gandharve Nagari Moshi
Iron (as Fe)	mg/L	0.462	0.424	0.188
Vanadium (as V)	mg/L	0.041	0.028	0.031
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	0.147	BLQ	BLQ
Bioassay Test on fish	% survival	97	97	100

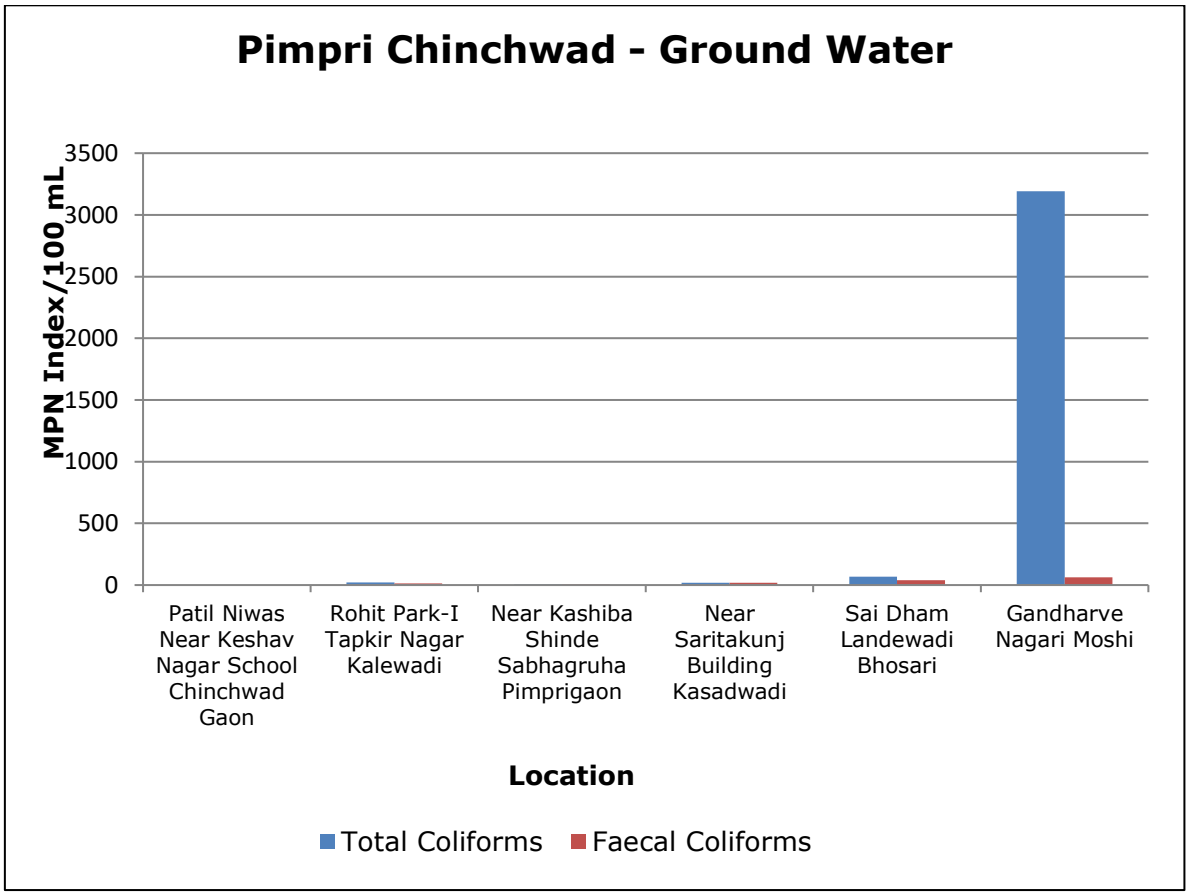
Graphs - Ground Water Quality

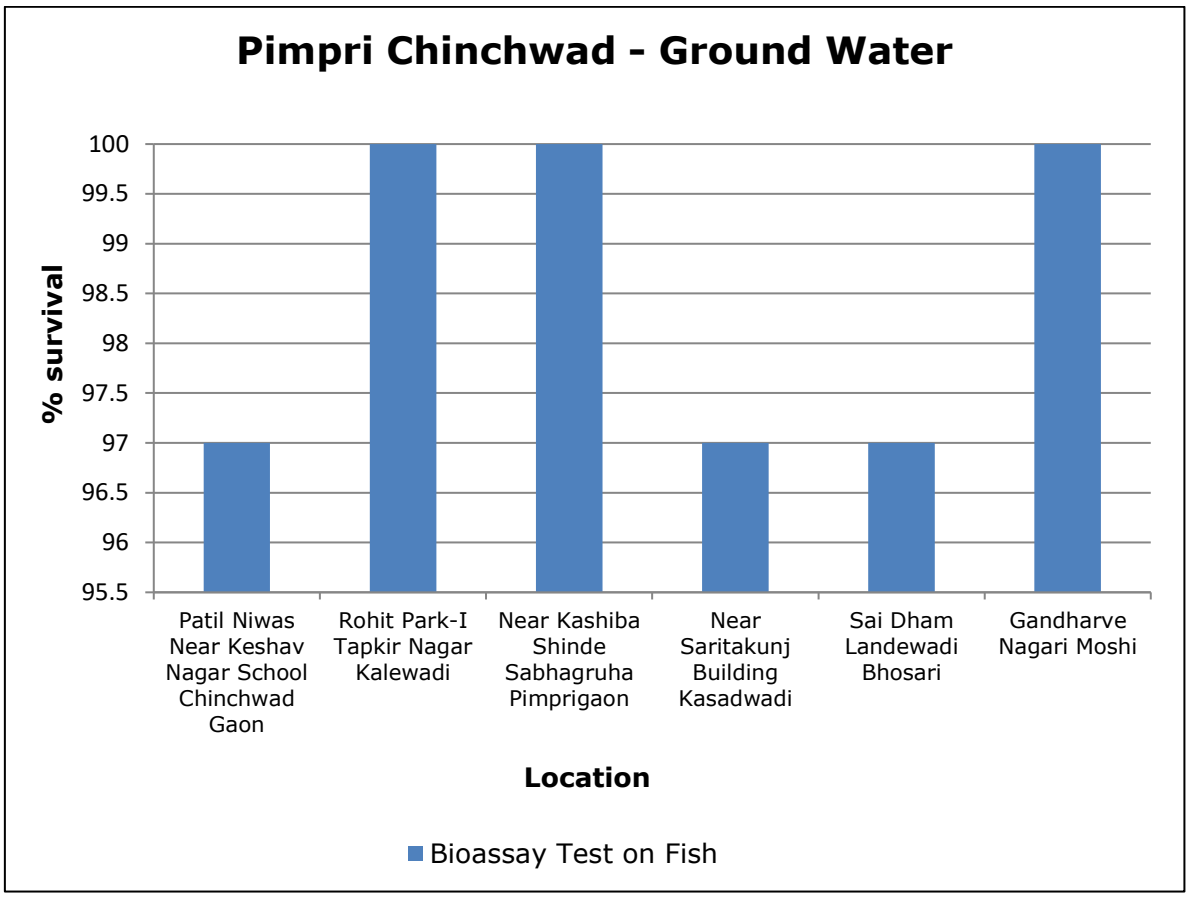



Pimpri Chinchwad - Ground Water
Concentration (µmhos/cm)
1200
1000
800
600
400
200
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
Electrical Conductivity


Pimpri Chinchwad - Ground Water
Concentration (mg/L)
600
500
400
300
200
100
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
SS
TDS
COD
BOD


Pimpri Chinchwad - Ground Water
Concentration (mg/L)
0
1
2
3
4
5
6
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
NO2
NO3
NO2+NO3-N
Dissolved Phosphate
Total Phosphorous
TKN
Total Nitrogen


Pimpri Chinchwad - Ground Water
MPN Index/100 mL
0
500
1000
1500
2000
2500
3000
3500
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
Total Coliforms
Faecal Coliforms


Pimpri Chinchwad - Ground Water
% survival
100
99.5
99
98.5
98
97.5
97
96.5
96
95.5
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
Bioassay Test on Fish

8. Health Related Data

C: Receptor

Table 10.1 Details of Component C

Component C (Impact on Human Health) 10	
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.

Table 8.1 CEPI score of the Post monsoon season 2024

	A1	A2	A	B	C	D	CEPI
Air Index	3.5	2.5	8.75	0	10	0	**18.75**
Water Index	2.5	2.5	6.25	30	10	0	**46.25**
Land Index	2.5	2.5	6.25	17	10	0	**33.25**
						Aggregated CEPI	**49.60**

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI score March 2024	18.75	46.25	33.25	**49.60**
CEPI score June 2024	18.75	46.88	15.00	**48.37**
CEPI score March 2024	20.25	29.63	21.50	**32.69**
CEPI score June 2023	9.88	46.25	34.00	**48.06**
CEPI score March 2023	19.9	36.3	43.8	**47.9**
CEPI score June 2021	17.5	34.9	43.8	**47.2**
CEPI Score March 2021	20.5	34.9	32.6	**39.3**
CEPI score March 2020	43.1	7.5	38.1	**44.7**
CEPI score June 2019	33.1	30.2	30.5	**39.26**

	Air Index	Water Index	Land Index	CEPI
CEPI score March 2019	36.3	32.9	29.2	**42.4**
CEPI score June 2018	37	25.15	26.99	**40.82**
CEPI score March 2018	34.45	37.4	36.91	**43.49**
CPCB CEPI score March 2018	52	6.25	5.25	**52.16**

CEPI score calculation:

Ambient Air Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
PM_{10}	B	2	Moderate	
$PM_{2.5}$	B	0.5		
Benzene	C	1		
		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 Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
PM_{10}	63.00	100	0.63	0	8	0.00	L	0
$PM_{2.5}$	16.13	60	0.27	0	8	0.00	L	0
Benzene	2.44	5	0.49	0	8	0.00	L	0
B score = (B1+B2+B3)							**B**	**0**

C	**10**	**>10 %**
D	**0**	**A-A-A**

Air CEPI Score	**(A+B+C+D)**	**18.75**

Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
BOD	B	2	Moderate	
Zn	A	0.25		
TN	A	0.25		
		2.5	**2.5**	**6.25**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
BOD	13.83	8	1.73	5	6	1.44	C	30
Zn	0.04	0.3	0.13	0	6	0.00	L	0
TN	3.94	15	0.26	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**30**

C	**10**	**>10%**
D	**0**	**A-A-A**

Water CEPI Score	**(A+B+C+D)**	**46.25**

Ground Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
BOD	B	2	Moderate	
Fe	A	0.25		
F	A	0.25		
		2.5	**2.5**	**6.25**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
BOD	7.50	8	0.94	2	6	0.31	M	12.75
Fe	0.28	0.3	0.92	2	6	0.31	M	4.25
F	0.51	1.5	0.34	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**17**

C	**10**	**>10%**
D	**0**	**A-A-A**

Land CEPI Score	**(A+B+C+D)**	**33.25**

Water CEPI Score (im) **46.25**

Land CEPI Score (i2) **33.25**

Air CEPI Score (i3) **18.75**

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 = **49.60**

10. Conclusion

Ambient Air Quality

- The AAQ stations were identified in the CEPI impact area to cover both upwind and crosswind directions and AAQ survey was conducted.
- All air quality parameters are observed well within the limits as per NAAQS, 2009.
- Concentration of PM10 is observed in the range of 50 µg/m^3 to 68 µg/m^3 and PM2.5 in the range of 13 µg/m^3 to 19 µg/m^3 at the studied locations.
- In the CEPI score calculated for Air Environment by CPCB in March 2018, PM10 and PM2.5 have exceeded which may also be due to the vehicular emissions.

Surface Water Quality

- There is marginal increase observed in the BOD and COD as compared to the previous CEPI report for month of June 2024
- All the industries in the Pimpri-Chinchwad region are either reusing / recycling the treated trade effluent for internal process or gardening or are disposing of as per consent norms.

Ground Water Quality

- Ground water samples were collected from different Bore well in the region.
- Concentration of BOD and Iron an is found higher than the standard limits in four water samples.
- In the CEPI score calculated for Land Environment by CPCB in March 2018 also there is no critical pollutant exceeding in any water sample collected.

CEPI Score

- The CEPI Score post monsoon season is 49.60.
- It seems that there is a increase in the CEPI score compared to the CEPI score of March 2025.
- In comparison with the CEPI score March 2024 a marginal decrease observed in the Air Index and increase Water Index and Land Index.
- The present study is the compilation of Post-monsoon season, which shows an increase in health impact of Ambient Air and water, hence resulted in higher CEPI score in comparison to the previous year.

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

- Drive against open burning of biomass, crop residue, garbage, leaves, etc.: Follow up with PCMC authority for not to allow open burning of biomass garbage.
- **Organic Waste Compost machines**: All construction project have provided organic waste compost machines for treatment of wet waste.
- **Waste collection and segregation centres**:
  - ✓ **Domestic Solid Waste**: PCMC has provided door to door waste collection and segregation facility for residential area.
  - ✓ **Industrial Non-Hazardous Waste**: Recyclable waste is sent to authorized waste recyclers and other waste collected by corporations.
  - ✓ **Hazardous Waste:** Industrial hazardous waste sent to common hazardous treatment and disposal facility by industries.
- **Construction of Common Effluent Treatment plant (CETP)**: A committee of all functional agencies (reg PMC, MIDC, MPCB, PMRDA, Zilla Parishad and all Municipal Councils) has been constituted under the chairmanship of Commissioner, Pimpri Chinchwad Municipal Corporation. Accordingly necessary survey of river from its source to its confluence and work of preparation of detailed projects report (DPR) is in process. The project report is being prepared by collecting information about all the industries in Pimpri Chinchwad Municipal Corporation as well as Talegaon, Chakan and Hinjewadi areas. It is propose to provide 1 MLD capacity CETP for electroplating industry, 2 MLD capacity CETP for other industries as well as 20 MLD (4 x 5 MLD) STP.

  1.
- **Installation of CEMS installed for Air and Water in Large and Medium scale RED category industries**: 03 no.
- **Online Monitoring systems**:

  2. Installation of CEMS installed for Air and Water in large and Medium scale RED category industries – 0.3 nos.
  3. Two NAMP station are operated by Pune University, Pune located at
     1) Pimpri Chinchwad Municipal Corporation
     2) Maratha Chamber of Commerce Building
  4. In jurisdiction of SRO-PC three sites of CAAQMS in operation
     1) Rose Garden, Gavali matha, PCMC
     2) Jagtap Daity, Pimple Nilakh, PCMC
     3) Chh. Shivaji Maharaj Statue, PCMC
  5. MPCB has proposed additional 2.0 no of CAAQMS stations in PCMC area.

  MPCB has installed real time noise monitoring stations. 4 nos. in PCMC area.
- Arrangement of scientific collection and treatment of sewage generated: Domestic effluent generation is 359 MLD, out of which 305 MLD is treated by 19 nos. of STP located at various locations. Due to lack of drainage network 54 MLD domestic effluent dispose in river Pawna, Mula

& Indrayani. PCMC has propose 9 no of STPs of total capacity 126 MLD, out of which installed work of 4 nos. of STPs of capacity 47 MLD are in progress.

- Installation of CAAQMS station: 3 no of CAAQM stations provided at Rose Garden, Gavali Matha, Bhosari, PCMC garden, Jagtap Dairy, Pimple Nilakh and Chhatrapati Shivaji Maharaj Garden Dange Chowk, Pune and all in CAAQM stations are in operation for monitoring of air quality.
- Number of CAAQMS proposed for future : 2 nos.
- Establishment of Monitoring stations under National Water Quality Monitoring Programme (NWMP) are 06.
- Steps are taken for industrial area/other units to recycle 100% treated effluent to achieve zero liquid discharge (ZLD): MPCB is issuing consents to the industries with a condition to provide zero liquid discharge condition. i.e. 100% treated water for the secondary purpose and with a condition to use clean fuel for processing as LPG, CNG, electricity. Also issued directions to all industries for Retrofitting of Emission Control Device (RECD) for in use Diesel operated internal combustion engines for generator set.
- Steps taken to reduce dust emission:
    1) Hon'ble Chairman, MPCB has issued direction u/s of 5 of the EPA, 1986 to PCMC on 02.11.2023 for improvement of air quality in the city by implementation of Grated Response Action Plan (GRAP). Also, PCMC has developed the Graded Response Action Plan (GRAP) for city with specific measures based on AQI range along with fine for violations.
    2) Regular survey of air pollution causing industries like RMC and stone crusher is carried out and legal actions are taken on various industries. As per guidelines compliances are verified regularly carried out.
    3) PCMC is also implementing guidelines at various construction sites to reduce air pollution.
    4) PCMC is implementing various activities to control air pollution under the National Clean Air Program (NCAP) Under NCAP-fund of Rs. 172.97 crore has been sanctioned and PCMC has submitted details of activity proposed under NCAP as electric & CNG bus, installation of electric charging stations, provision of water fountains, Biomass plant, road washers machins, construction of roads, installation of air purifier, C&D waste plant, cannon dust suppression systems, rooftop solar system, electric crematorium, installation of CAAQMS and mobile van.
    5) During Ganesh festival, awareness and follow up with PCMC to provide artificial pond for idol immersion and total ban on idol immersion into river water. Noise monitoring during Ganesh Festival at Ganesh Mandals.

Continuous Ambient Air Quality Monitoring Station

Ambient Air Quality Monitoring Van

PIMPRI-CHINCHWAD: Mechanized Road Sweeper [40 km in one shift]

Cycle Track

470 Nos. of E-Buses [20% of Fleet] have travelled for more than 4 Crore kms, resulting in an overall CO_2 reduction of more than 7000 tonnes. India's Largest E-bus depot is in Pune

12. Photographs

Ambient Air Sampling at Pimpri Chinchwad Municipal Corporation

Ambient Air Sampling at Thergaon Near Puduji Industries

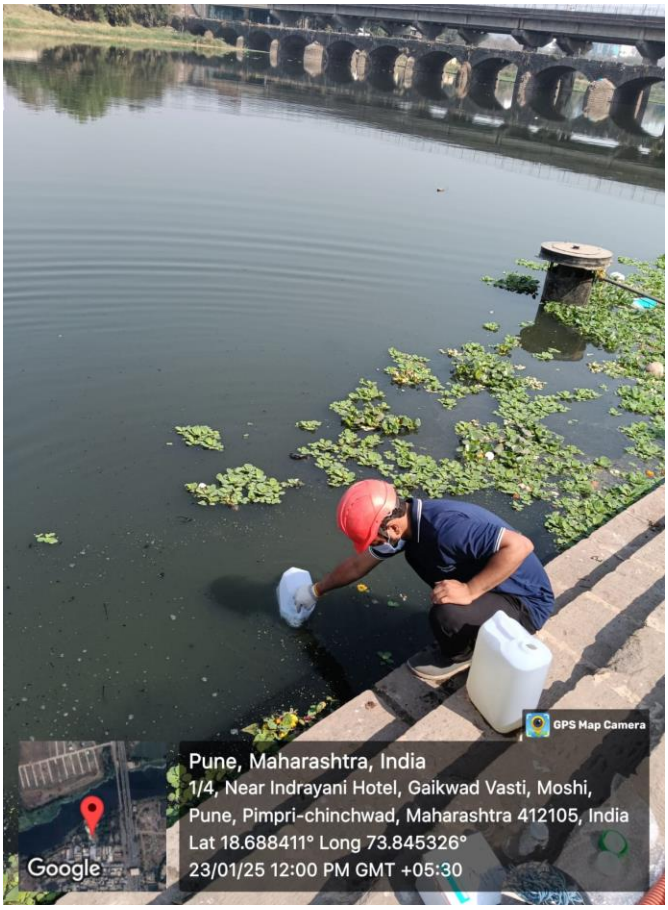
Ambient Air Sampling at MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall

Ambient Air Sampling at Akurdi Near Force Motor

Surface water sampling at Pawana River- Chinchwad

Surface water sampling at Pawana River- Ravet

Surface water sampling at Indrayani River- Chikhali



Surface water sampling at Indrayani River – Moshi Bridge

Surface water sampling at Pawana River- Ksarwadi

Ground water Sampling at Gandharve Nagari Moshi

Ground water Sampling at Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Ground water Sampling at Rohit Park-I Tapkir Nagar Kalewadi
Ground water Sampling at Sai Dham Landewadi Bhosari	**Ground water Sampling at Near Saritakunj Building Kasarwadi**

Annexure – I Health Related Data

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Pre-monsoon Season (April 2024- June 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	PIMPRI-CHINCHWAD
Name of the major health center/ organization	Akurdi Hospital
Name and designation of the Contact person	Dr. Balasaheb. Hodgar. (9922501316)
Address	H.B.P.Prabhakar.M. Kute Hospital, Akurdi

S No.	Diseases	No. of Patients Reported	
		Year 2023	Year 2024
AIRBORNE DISEASES			
1.	Asthma	25	1700
2.	Acute Respiratory Infection	5425	6238
3.	Bronchitis	51	1255
4.	Cancer	Nil	Nil
WATERBORNE DISEASES			
1.	Gastroenteritis	144	286
2.	Diarrhea	501	606
3.	Renal diseases	Nil	164
4.	Cancer	Nil	Nil

Date:
10/2/25

Signature

जेष्ठ वैद्यकिय अधिकारी (वर्ग)
ह.ब.प. प्रभाकर मल्हारराव कुटे
मेमोरीअल हॉस्पिटल

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Pre-monsoon Season (April 2024- June 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	PIMPRI-CHINCHWAD
Name of the major health center/ organization	Niramay Hospital, Chinchwad
Name and designation of the Contact person	DR. Sofiya Shaikh CEO
Address	Niramaya Hospital, chinchwad station.

S No.	Diseases	No. of Patients Reported	
		Year 2023 JAN to Dec	Year 2024 JAN to Dec
AIRBORNE DISEASES			
1.	Asthma	27	8
2.	Acute Respiratory Infection	64	39
3.	Bronchitis	96	81
4.	Cancer	156	152
WATERBORNE DISEASES			
1.	Gastroenteritis	159	338
2.	Diarrhea	02	01
3.	Renal diseases	43	68
4.	Cancer	-	—

Date: 21/02/2025

Sofiya
Signature
Dr. Sofiya Shaikh
Dr. Sofiya Shaikh
Chief Executive Officer
Niramaya Hospitals Pvt. Ltd.
CEO
Niramaya Hospital

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Pre-monsoon Season (April 2024- June 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	PIMPRI-CHINCHWAD
Name of the major health center/ organization	Yashwantrao Chavan Memorial Hospital
Name and designation of the Contact person	Dr. Rajendra Wabale, Dean of PGI YCMH
Address	PGI YCMH, Sant Tukaram Nagar, Pimpri-411018

S No.	Diseases	No. of Patients Reported	
		Year 2023(Jan-Dec)	Year 2024(Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	213	360
2.	Acute Respiratory Infection	692	730
3.	Bronchitis	243	1400
4.	Cancer	460	409
WATERBORNE DISEASES			
1.	Gastroenteritis	603	523
2.	Diarrhea	273	104
3.	Renal diseases	630	969
4.	Cancer	19	16

Date: 14-02-2025

14.2.25.
Signature
DEAN
PG Institute
PCMC's Y.C.M. Hospit
Pimpri, Pune-411 01