

**SO<sub>2</sub>**

**NO<sub>x</sub>**

**RSPM**

# **Air Quality Status of Maharashtra 2017-18**

**CO**

**O<sub>3</sub>**

**BTX**



Maharashtra Pollution Control Board  
महाराष्ट्र प्रदूषण नियंत्रण मंडळ



The Energy & Resources Institute





# Air Quality Status of Maharashtra 2017-18

Prepared for



Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Prepared by



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The Energy and Resources Institute

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## Abbreviations

AAQM	Ambient Air Quality Monitoring
AAQMS	Ambient Air quality monitoring stations
ALRI	Acute Lower Respiratory Infections
AMR	Amravati
AQI	Air Quality Index
Ar	Argon
AUR	Aurangabad
CAAQMS	Continuous Ambient Air quality monitoring stations
CDP	Chandrapur
CH <sub>4</sub>	Methane
CIDCO	City and Industrial Development Corporation of Maharashtra Ltd
CO	Carbon monoxide
CO <sub>2</sub>	Carbon-di-oxide
CPCB	Central Pollution Control Board
GoM	Government of Maharashtra
H <sub>2</sub>	Hydrogen
He	Helium
IIT	Indian Institute of Technology
INAQS	Indian National Air Quality Standards
KOP	Kolhapur
Kr	Krypton
Max	Maximum
MIDC	Maharashtra Industrial Development Corporation
Min	Minimum
MPCB	Maharashtra Pollution Control Board
MVD	Motor Vehicle Department
N <sub>2</sub>	Nitrogen
NAAQM	National Ambient Air Quality Monitoring
NAAQS	National Ambient Air Quality Standards
NAMP	National Ambient Monitoring Programme
Ne	Neon
NEERI	National Environmental Engineering Research Institute

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NGP	Nagpur
NHK	Nashik
NO <sub>2</sub>	Oxides of Nitrogen
NOX	Nitrogen Oxides
NVM	Navi Mumbai
O <sub>2</sub>	Oxygen
O <sub>3</sub>	Ozone
Pb	Lead
PM	Particulate Matter
PM10	Particulate Matter less than 10 microns
PM2.5	Particulate Matter less than 2.5 microns
PUN	Pune
RGD	Raigad
RO	Regional Office
RSPM	Respirable Suspended Particulate Matter
SAMP	State Air Monitoring Program
SO <sub>2</sub>	Sulphur dioxide
SPM	Suspended Particulate Matter
TERI	The Energy and Resources Institute
TNA	Thane
TTC	Trans Thane Creek
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
µg/m <sup>3</sup>	Micrograms per cubic meter



## Executive Summary

MPCB (Maharashtra Pollution Control Board) is a statutory body, established in the year 1981 with a presence of 12 RO (Regional Offices) across Maharashtra state. It is a major regulatory body responsible for effective implementation of environmental laws and curbing pollution in the state. It can enforce laws, rules, notifications pertaining to prevent and to control pollution thereby ensuring sustainable development in the state. As a part of this, MPCB regularly monitors air pollution levels in the state. For this, the board has installed various AAQMS (Ambient Air Quality Monitoring Stations) across the state under the NAMP (National Air Monitoring Program) and SAMP (State Air Monitoring Program). In the year 2017-18, there were 75 active AAQMS in Maharashtra under NAMP (64), SAMP (1) and Continuous AAQMS (CAAQMS) (10). Out of total CAAQMS, 1 new CAAQMS has commissioned this year at Civil Lines, Chandrapur.

The installed AAQMS measure and record the levels of criteria air pollutants SO<sub>2</sub> (Sulphur Dioxide), NO<sub>x</sub> (Oxides of Nitrogen) and RSPM (Respirable Suspended Particulate Matter) while the CAAQMS also monitor other air pollutants like O<sub>3</sub> (ozone), benzene, CO (Carbon Monoxide) and so on, as presented below in Table No. 1. The observations recorded across the AAQMS for the SO<sub>2</sub>, NO<sub>x</sub> and RSPM levels in the year 2017-18 are presented through illustrations to depict the daily, monthly and annual data sets. While the secondary pollutants like Ozone and Carbon Monoxide have been analysed for their eight hourly concentrations whereas Benzene concentration was analysed for monthly average concentration.as against the respective standards.

Table No. 1: List of parameters monitored by various AAQMS across Maharashtra

Program	Frequency	Station name	SO <sub>2</sub>	Oxides of Nitrogen			PM		NH <sub>3</sub>	CO	O <sub>3</sub>	BTX
				NO	NO <sub>2</sub>	NO <sub>x</sub>	2.5	10				
NAMP & SAMP	Twice a week	65 AAQMS (Annex-1)	✓	--	--	✓	--	✓	--	--	--	--
CAAQMS	Daily	Aurangabad	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Chandrapur	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Civil Lines, Chandrapur	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Nagpur	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Nashik	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Dombivali	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Bandra	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Airoli	✓	--	--	✓	✓	✓	--	--	--	--
		Karve Road	✓	✓	✓	✓	✓	✓	--	✓	✓	✓
		Solapur	✓	✓	✓	✓	✓	✓	--	✓	✓	--

All AAQMS recorded SO<sub>2</sub> concentrations well within daily as well as annual standards. The AAQMS at Industrial area, CIDCO recorded highest SO<sub>2</sub> concentration of 47µg/m<sup>3</sup> which is under the prescribed annual standard value of 50µg/m<sup>3</sup>. It is worth noting that compared to previous year, the station recorded less concentration of SO<sub>2</sub> from 78µg/m<sup>3</sup>.in 2016-17 to 47µg/m<sup>3</sup> in 2017-18.

Due to the presence of industrial complexes, all 10 AAQMS of Kalyan region recorded concentrations between 21-30  $\mu\text{g}/\text{m}^3$  whereas the cities of Nagpur, Nashik, Amravati, Aurangabad and Chandrapur recorded annual  $\text{SO}_2$  concentrations less than  $20\mu\text{g}/\text{m}^3$  and were relatively clean from  $\text{SO}_2$  pollution.

In the year 2017-18, out of 75 AAQMS across Maharashtra, 29 AAQMS recorded annual  $\text{NO}_x$  concentrations above the annual standard of  $40\mu\text{g}/\text{m}^3$ . All the 10 AAQMS in Kalyan region exceeded the annual  $\text{NO}_x$  standard ( $40\mu\text{g}/\text{m}^3$ ) and the AAQMS at Powai Chowk with levels of  $78\mu\text{g}/\text{m}^3$ , recorded the highest annual average  $\text{NO}_x$  concentrations followed by Sion AAQMS from Mumbai region with  $\text{NO}_x$  concentration of  $77\mu\text{g}/\text{m}^3$ . Similarly, AAQMS at Dombivali recorded the third highest annual average  $\text{NO}_x$  concentrations of about  $76\mu\text{g}/\text{m}^3$ , Except Airoli, all other 5 AAQMS in Navi Mumbai recorded higher  $\text{NO}_x$  concentrations. The cities of Amravati, Latur, Chandrapur, Nagpur and Nashik have reported annual  $\text{NO}_x$  concentrations less than  $40\mu\text{g}/\text{m}^3$ .

Strict implementation of vehicular norms and reducing traffic congestion is highly desirable in cities to curb  $\text{NO}_x$  pollution. Traffic management and periodic exhaust emission testing of vehicles, particularly diesel vehicles, may also contribute in reducing  $\text{NO}_x$  levels in those areas.

Maharashtra is facing a higher RSPM levels. The highest RSPM concentration was recorded at Ghuggus in Chandrapur region with  $298\mu\text{g}/\text{m}^3$  which is around 5 times the annual standard and it was followed by the AAQMS at Ambernath BIWA house, Badlapur and Dombivali, with levels exceeding 3 – 4 folds to  $259\mu\text{g}/\text{m}^3$ ,  $240\mu\text{g}/\text{m}^3$  and  $233\mu\text{g}/\text{m}^3$  respectively. It was found that Chandrapur and Dombivali region is highly affected with RSPM pollution.

Only 3 AAQMS namely Ganeshnagar and Mutha chowk, Shivaji University campus, Kolhapur recorded the annual RSPM levels lower than prescribed annual standard of  $60\mu\text{g}/\text{m}^3$ . The average annual RSPM concentration at AAQMS, Airoli increased from  $42\mu\text{g}/\text{m}^3$  in 2016-17 to  $61\mu\text{g}/\text{m}^3$  in the current year thereby minutely exceeded the standard limit.

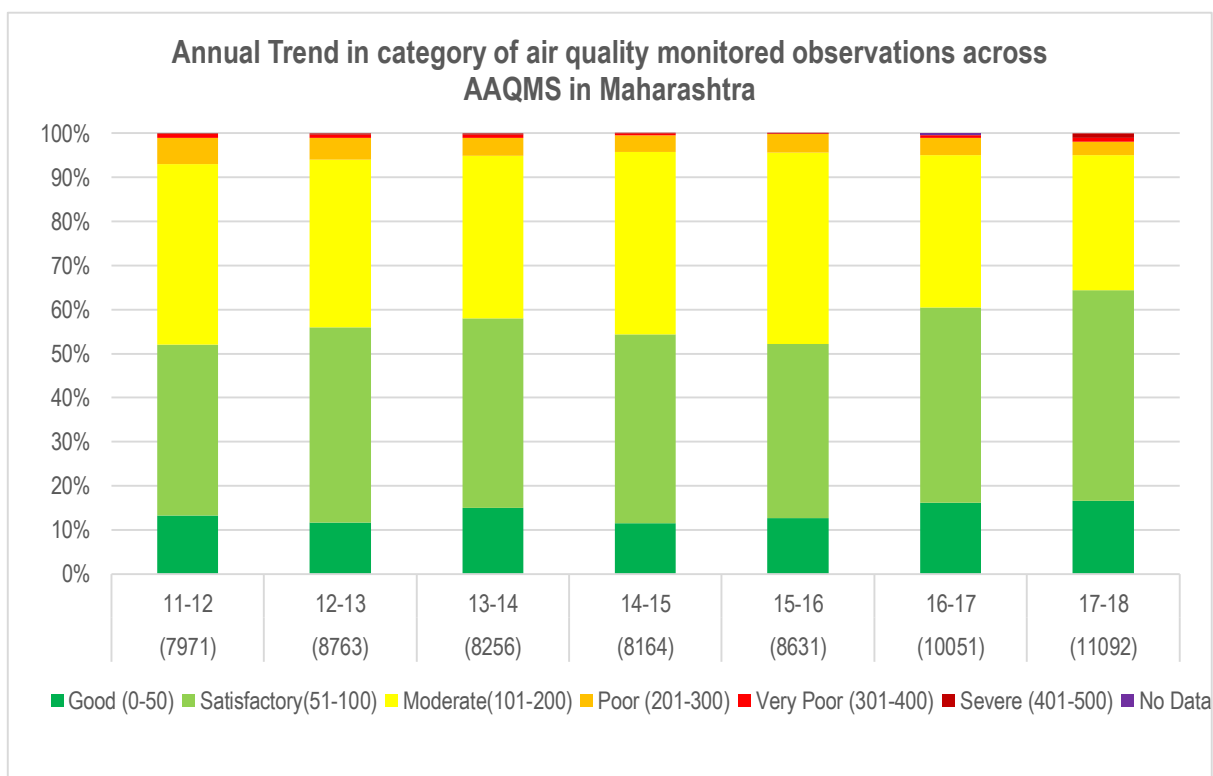
The high concentration of RSPM maybe is attributed to emission from industries, construction sector and road dust re-suspension due to vehicular movement, vehicular emissions, quarrying, mining activities, municipal waste burning and use of fossil fuels for cooking along with natural activities in the region. Appropriate operation and maintenance practices at mines and quarry sites like use of water mists, wind screens, low dump sites, Construction of even and smooth roads, appropriate sweeping of roads and strict norms for construction sector should be regulated to minimize the dispersion of RSPM in the air.

Ozone and CO concentration were recorded in 9 CAAQMS locations. In case of Ozone, Aurangabad, Nashik and Solapur CAAQMS recorded higher 8 hourly ozone concentration than the standard limit of  $100\mu\text{g}/\text{m}^3$  Among these 3 CAAQMS, Solapur CAAQMS recorded highest ozone concentration ranging from 10 to 30% increase than the standard limit whereas The CAAQMS installed at Bandra, Chandrapur, Civil lines-Chandrapur, Dombivali, Nagpur and Pune recorded  $\text{O}_3$  concentrations that were within the prescribed standard limit of  $100\mu\text{g}/\text{m}^3$ .

In case of CO, similar situation was observed wherein Solapur CAAQMS recorded higher 8 hourly CO concentration than the standard limit of  $2\text{mg}/\text{m}^3$  for 7 months. Particularly in the month of January, the concentration recorded was around  $4\text{mg}/\text{m}^3$ , double than the standard concentration. Bandra, Dombivali, Nagpur and Pune CAAQMS also recorded

higher ozone concentration whereas the concentration was within the limit in Aurangabad, Chandrapur, Civil lines - Chandrapur and Nashik

Benzene (C<sub>6</sub>H<sub>6</sub>) is a colorless sweet smelling liquid and is generated whenever carbon-rich materials undergo incomplete combustion of aromatic compounds like tobacco, furniture wax, glue paints and so on. Benzene pollution was recorded predominantly at 2 CAAQMS namely Dombivali and Nagpur. The annual average benzene concentrations were recorded to be 7.6µg/m<sup>3</sup> and 5.8µg/m<sup>3</sup> which is higher than the annual average standard of 5µg/m<sup>3</sup> prescribed by CPCB. Dombivali and Nagpur recorded high benzene concentrations in the month of October and December with concentration reaching as high as 14µg/m<sup>3</sup> and 12µg/m<sup>3</sup> respectively. Similar trend was observed during the month of January to March at both locations.



**Figure No. 1: Annual trend in share of classes of AQI across Maharashtra for past seven years**

Thus in conclusion, the year 2017-18, 11092 observations were recorded across 75 active AAQMS in Maharashtra representing 25 cities. As seen in Figure No.2, it is interesting to note that more than 65% (7141) daily observations were in 'Good' and 'Satisfactory' category as against the share of 60% in the last year, thus, recording an improvement in terms of non-polluted days in Maharashtra. The share of 'Moderate' (~30%) and 'Poor' (3%) air quality days also recorded a decrease as compared to last year's share of 35% and 4% respectively. In terms of polluted categories, less than 2% of the observations days were categorised as 'Very Poor' and 'Severe' air quality days.





# Introduction

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Air comprises of number of invisible gaseous substances with varying concentrations that surrounds the earth<sup>1</sup>. Gaseous substances includes primarily Nitrogen (78.09%) and Oxygen (20.95%). The remaining 1% comprises of Argon (0.93%), Carbon dioxide (0.039%) and other trace gases (0.003%) including water vapour. Air is important for almost all life forms on earth. Plants need gasses from air to perform photosynthesis while animals need to breath air to get the oxygen for respiration. Air is a third critical resource for all organisms within a natural area. Any change in the normal composition of air due to addition of undesired elements from anthropogenic activities like combustion of fossil fuels, power plants, industries, automobiles, construction activities and so on can result in air pollution which may impair visibility, affects health of living beings, cause acidification of streams and lakes, degrade natural resources. Hence, it is very important to continuously monitor air quality in order to control or lower pollution levels.

The presence of any air pollutant (means any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment) is termed as Air pollution<sup>2</sup>. Every year, Air pollution leads to millions of deaths around the world due to inhaling polluted air which contains various toxic gases and fine, suspended particulate matter. A resting adult breaths air 12-18 times each minute, roughly one for every four heartbeats. The proportion of inhaling air is higher among children, with about 18-20 breaths per minute<sup>3</sup>. It is estimated that Bangladesh and India experienced steepest rise in PM 2.5 concentrations among 10 most populous countries since 2010 with about 4.2 million deaths due to PM 2.5 exposure (fifth highest risk factor for total deaths worldwide. Globally there was an increase in Ozone attributable deaths by 60%, with striking 67% of this increase happened in India.

Variety of pollutants may pollute air in variety of forms. Almost any toxic chemical could make its way into the atmosphere to pollute the air. The chemical compounds which degrades or lowers the air quality are usually referred as air pollutants. These compounds may be found in air in the form of gases or solid form as suspended particulate matter. A number of gases are linked to the concept called 'Greenhouse Gas Effect' wherein those gases shows ability of retaining more heat thereby contributing more in global warming. Carbon dioxide, methane, nitrous oxide (N<sub>2</sub>O) are among the major anthropogenic greenhouse gases. Air pollution may be caused by various processes, either natural or man-made. Natural sources include volcanic activities, wind and air currents, forest fires, microbial decaying processes and dust storm while man made sources are mining-smelting, construction-demolition activities, fuel combustion, waste disposal practices to name a few. Pollutants can originate from point, non-point and mobile sources. Stationary objects which release pollutants are classified as point sources (eg: factories, smoke stacks), non-point sources include residential, hospitals, waste disposal and agriculture operations while the

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<sup>1</sup> <https://en.oxforddictionaries.com/definition/air>

<sup>2</sup> [The Air \(prevention and control of pollution\) act, 1981](#)

<sup>3</sup> <http://www.cmascience.nl/activities/en/biology/Human%20Physiology/Human%20breathing/Human%20breathing%20-%20Science%20background.pdf>

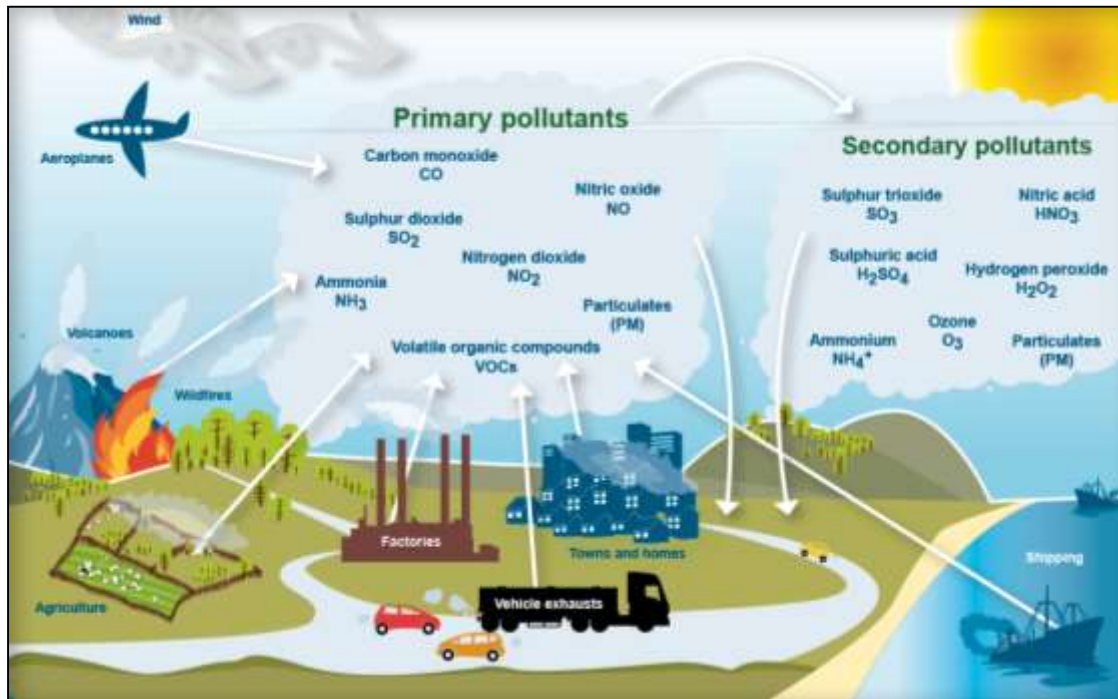
mobile sources include transportation vehicles-cars, trucks, tractors, boats. Air pollutants are classified as:

1) **Primary pollutants:**

Primary air pollutants are the ones that are emitted directly into the atmosphere by the sources (power-generating plants).

2) **Secondary pollutants:**

Secondary air pollutants are the ones that are formed as a result of reactions between primary pollutants and other elements in the atmosphere



Picture No. 1: Air Quality Criteria Pollutant Diagram<sup>4</sup>

<sup>4</sup> <https://infograph.venngage.com/p/93/danas-infographic-pollution>

The National Ambient Air Quality Standards set by USEPA (United States Environmental Protection Agency) identified six principal pollutants as Criteria Pollutants namely NO<sub>x</sub> (Nitrogen dioxide), PM (Particulate matter 2.5 and 10), CO (Carbon monoxide), SO<sub>2</sub> (Sulphur dioxide), Pb (Lead) and O<sub>3</sub> (Ozone-Tropospheric) that are considered as harmful to the environment and public health. These standards are of two types namely,

- Primary Standards, for public health which includes protecting health of “sensitive” populations such as elderly, children and asthma patients.
- Secondary Pollutants, for public welfare which includes protection against decreased visibility and damage to buildings, animal, crops and vegetation.

Units for measuring the standards are ppm (parts per million) by volume, ppb (parts per billion) by volume and µg/m<sup>3</sup> (microgram per meter cube) of air<sup>5</sup>.



**Picture No. 2: Criteria Pollutants under National Ambient Air Quality Standards**  
Data Source : Environmental Protection Agency- EPA

<sup>5</sup> <https://www.epa.gov/sites/production/files/2015-02/documents/criteria.pdf>



# Air Quality Monitoring in Maharashtra

Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen as NO<sub>2</sub>, Respirable Particulate Matter (PM10) and Fine Particulate Matter (PM2.5) were identified for regular monitoring at all locations. It also included other important meteorological parameters such as wind speed and wind direction, relative humidity and temperature. Every year, the monitoring is carried out by Central Pollution Control Board, State Pollution Control Boards, Pollution Control Committees and National Environmental Engineering Research Institute (NEERI). The monitoring of pollutants is carried out for 24 hours (4-hourly sampling for gaseous pollutants and 8-hourly sampling for particulate matter) with a frequency of twice a week, to have 104 observations in a year. In the year 2017-18, under NAMP, there were around 703 operating stations for generating air quality database covering 307 cities in 29 States and 6 union territories<sup>6</sup>. Further, CPCB under the Air (Prevention and Control) Act has set the NAAQS (National Ambient Air Quality Standards), revised on 18 November 2009 ([Appendix A](#)), with objectives of (1) To indicate the levels of air quality necessary with an adequate margin of safety to protect public health, vegetation and property, (2) To assist in establishing priorities for abatement and control of pollutant level, (3) To provide a uniform yardstick for assessing air quality at national level and (4) To indicate the need and extent of the monitoring programme.

Under the provision of Maharashtra Prevention of Water Pollution Act, 1969, Maharashtra Pollution Control Board was established on 7<sup>th</sup> September, 1970. In the year 1981, a central legislation, The Water (Prevention and Control of Pollution) Act, 1974 was adopted by Maharashtra and accordingly Maharashtra Pollution Control Board was formed under the provisions of section 4 of Water (Prevention & Control of Pollution) Act, 1974. In 1983, Maharashtra adopted Air (Pollution and Control of Pollution) Act, 1981. MPCB implements a range of environmental legislation, via its 12 RO's (Regional Offices)-Table No. 2, in the state and functions under the administrative control of Environment Department, Government of Maharashtra.

**Table No. 2: Regional Offices of MPCB**

Jurisdiction of Regional Offices			
1.Amaravati	2.Aurangabad	3.Kalyan	4.Kolhapur
5.Mumbai	6.Nagpur	7.Nashik	8.Navi Mumbai
9.Pune	10.Raigad	11.Thane	12.Chandrapur

<sup>6</sup> <http://www.cpcb.nic.in/Network.php>

In order to monitor and control the air pollutants within the State, MPCB has installed around 80 air quality monitoring stations under NAMP, highest as compared to any other state in India (Figure No. 2). The state board also plan to install 14 CAAQMS stations in Mumbai-Navi Mumbai -Kalyan and Vasai-Virar area along with 60 manual stations in all over state of Maharashtra.

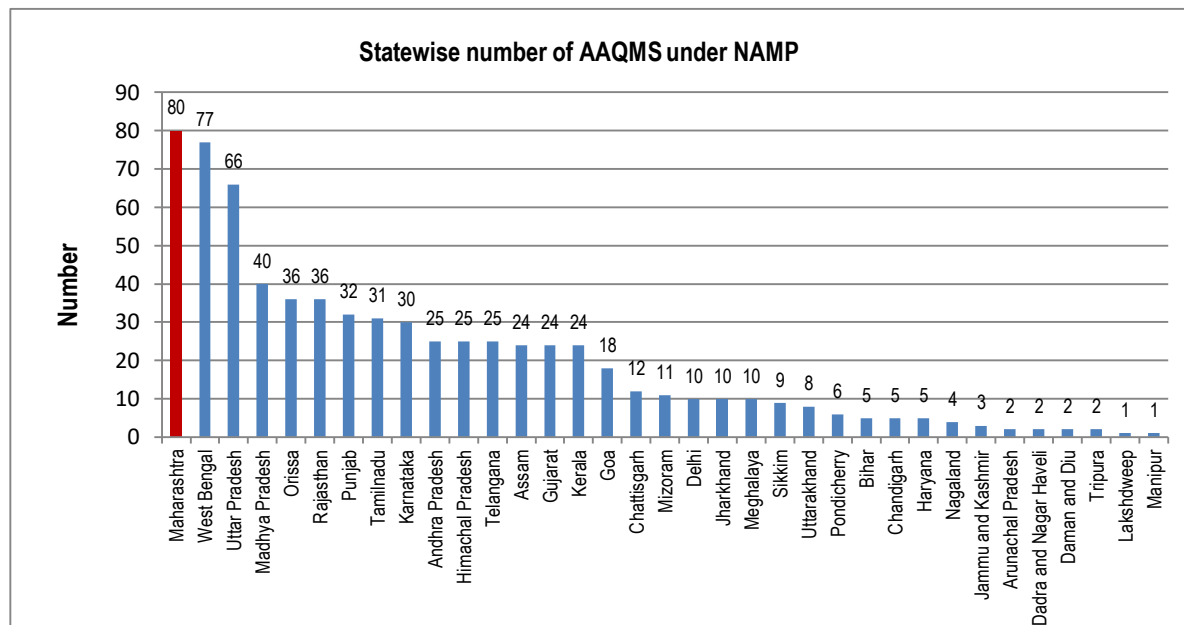


Figure No. 2: State wise number of AAQMS under NAMP

Data source: <http://cpcb.nic.in/monitoring-network-3/>

### Active monitoring sites in Maharashtra (2017-18)

As seen in Figure No. 33, there were 75 active AAQMS ([Annex-1](#)), 64 under NAMP (National Ambient Monitoring Program), 1 under SAMP (State Ambient Monitoring Program) and 10 under CAAQMS (Continuous Ambient Air Quality Monitoring) which recorded air quality of 25 cities in Maharashtra. The details of the cities and the number of AAQMS sites is presented in **Table No. 3**.

The monitoring at the CAAQMS is carried out for 24 hours to help monitor real time concentrations for pollutants like- SO<sub>2</sub>, NO, N<sub>2</sub>O, NO<sub>x</sub>, Butene-Toluene-Xylene, CO, O<sub>3</sub>, Particulate Matter and so on. The CAAQMS also records meteorological parameters like Wind speed and direction, relative humidity, solar radiation, rainfall and barometric pressure. CAAQMS uses data logging system to store the data by using various environmental softwares like Envidas, Comply and so on.

Parameters like SO<sub>2</sub> (Sulphur dioxide), NO<sub>2</sub> (Oxides of Nitrogen) and RSPM (Respirable Suspended Particulate Matter) were monitored by all AAQMS with a minimum frequency of two observations per week. Along with these parameters CO (Carbon Monoxide), Ozone, Benzene are also monitored by CAAQMS sites at Aurangabad, Chandrapur, Dombivali, Nagpur, Nashik, Pune, Bandra, and Solapur.

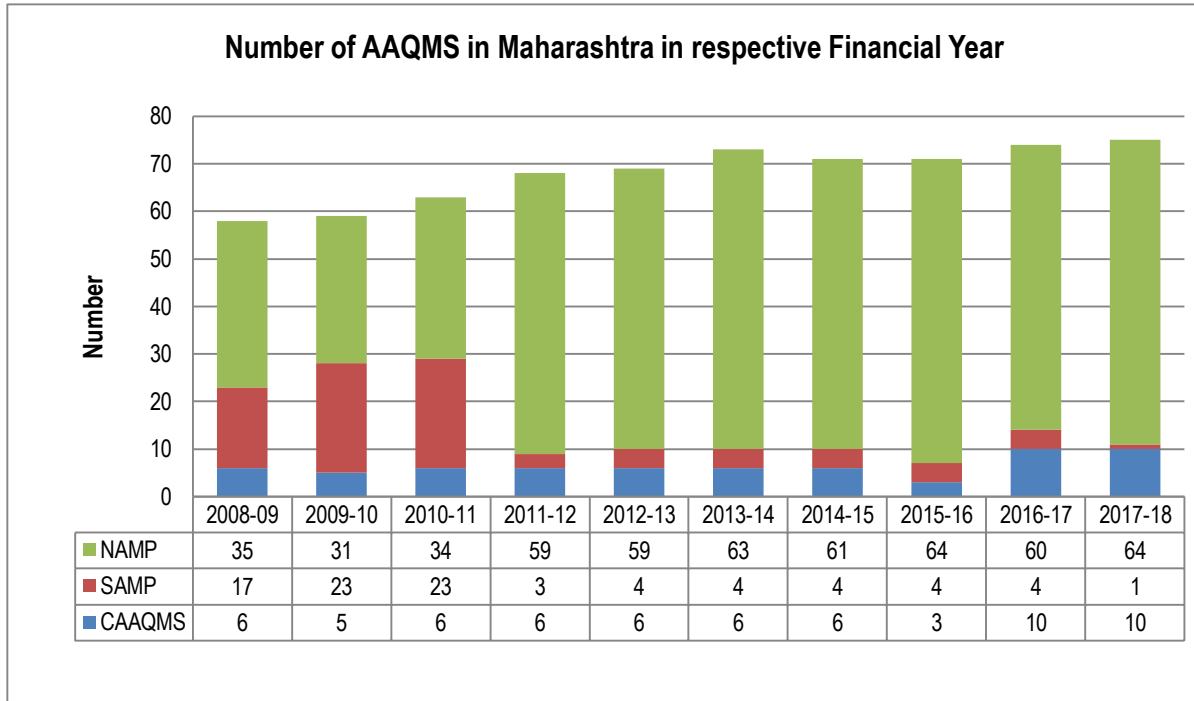


Figure No. 3: Number of active AAQMS in Maharashtra in respective financial year

Table No. 3: City and Program type wise number of AAQMS in Maharashtra

Sr No	Regional office	City	Program Type			Total
			CAAQMS	NAMP	SAMP	
1.	Amravati	Akola	--	3	--	3
2.		Amravati	--	3	--	3
3.	Aurangabad	Aurangabad	1	3	--	4
4.		Jalna	--	2	--	2
5.		Latur	--	3	--	3
6.		Nanded	--	3	--	3
7.	Chandrapur	Chandrapur	2	6	--	8
8.	Kalyan	Ambernath	--	1	--	1
9.		Badlapur	--	1	--	1
10.		Bhiwandi	--	2	--	2
11.		Dombivali	1	1	1	3
12.		Kalyan	--	1	--	1
13.		Ulhasnagar	--	2	--	2
14.	Kolhapur	Kolhapur	--	3	--	3
15.		Sangli	--	3	--	3
16.	Mumbai	Mumbai	1	1	--	2
17.	Nagpur	Nagpur	1	4	--	5
18.	Nashik	Jalgaon	--	3	--	3
19.		Nashik	1	4	--	5
20.	Navi Mumbai	Navi Mumbai	1	3	--	4
21.		Taloja	--	2	--	2
22.	Pune	Pune	1	4	--	5
23.		Solapur	1	2	--	3
24.	Raigad	Panvel	--	1	--	1
25.	Thane	Thane	--	3	--	3
	<b>Total</b>		<b>10</b>	<b>64</b>	<b>1</b>	<b>75</b>





# Status of Air Quality

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## Sulphur dioxide- SO<sub>2</sub>

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Sulphur oxides (SO<sub>x</sub>) are a group of compounds made up of sulphur and oxygen molecules. The most common sulphur oxide is sulphur dioxide (SO<sub>2</sub>).

Sulphur Dioxide (SO<sub>2</sub>) is a colourless gas with a pungent, irritating odour and taste.

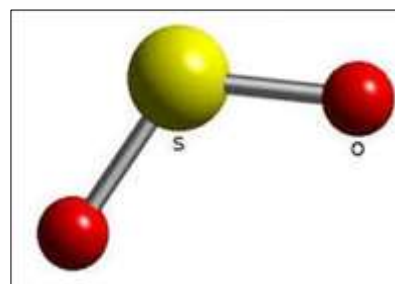
Being polar in nature, it readily dissolves in water to give an acidic solution which oxidizes to form sulphuric acid and is transported by wind currents over hundreds of miles and gets deposited as acid rain. Acid rain causes acidification of water bodies, corrosion to metal structures, skin diseases and so on.

### Sources:

- Natural: Volcanoes, biological decay and forest fires
- Anthropogenic: Fossil fuel combustion from industries and power plants, Smelting of metals, manufacture of sulphuric acid, incineration of refuse and production of elemental sulphur.

### Effects:

- Human Health: Respiratory illness, asthma, chronic bronchitis, affects lung function, coughing, irritation to skin and eyes.
- Environment: Acid rain



Common Name: Sulphur Dioxide.

Molecular Formula: SO<sub>2</sub>

Life Span in air: 4-10 days

*India's sulfur dioxide emissions has increased by 50 percent over the past decade and thus may be the world's top sulfur dioxide emitter ...*

*Research study by NASA and University of Maryland (2017)\**

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\*<https://www.nasa.gov/feature/goddard/2017/chinas-sulfur-dioxide-emissions-drop-indias-grow-over-last-decade>

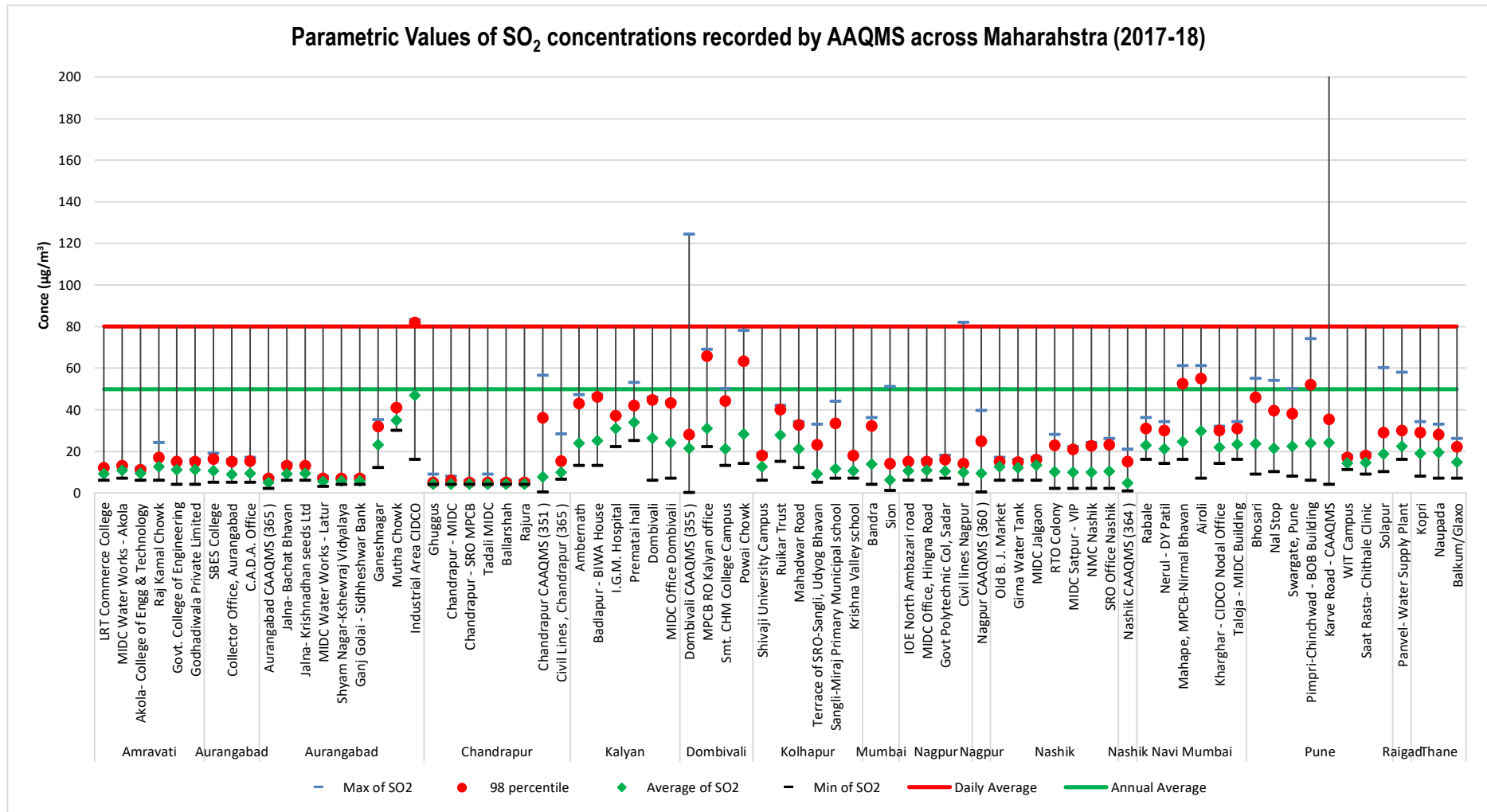


Figure No. 4: Parametric values of SO<sub>2</sub> concentrations recorded by AAQMS across Maharashtra (2017-18)

As seen in Figure No. 4, (refer annex-2 for datasets), all AAQMS recorded SO<sub>2</sub> concentrations well within daily as well as annual standards. The AAQMS at Industrial area, CIDCO recorded highest SO<sub>2</sub> concentration of 47 µg/m<sup>3</sup> which is under the prescribed annual standard value of 50 µg/m<sup>3</sup>. It is worth noting that compared to previous year, the station recorded less concentration of SO<sub>2</sub> from 78 µg/m<sup>3</sup> in 2016-17 to 47 µg/m<sup>3</sup> in 2017-18.

As seen in Table No.4 this station showed drastic decrease in SO<sub>2</sub> concentration. The second highest SO<sub>2</sub> concentration of 35 µg/m<sup>3</sup> was also recorded in Nanded city at the AAQMS installed at Mutha Chowk, which is one of the busiest and congested traffic junction of Nanded city. Compared to last years recording, this years SO<sub>2</sub> levels at both these locations have reduced by about 31 µg/m<sup>3</sup> and 1 µg/m<sup>3</sup> respectively.

Kalyan region having 10 AAQMS installed in the region, recorded SO<sub>2</sub> concentrations between 21-34 µg/m<sup>3</sup>. The region includes the Dombivali and Ambernath industrial areas having numerous chemical industries. However, the SO<sub>2</sub> concentrations were well within the annual standards. Similar to the previous year, the AAQMS at Bhiwandi (Prematai hall and IGM hospital) and Kalyan (MPCB RO Kalyan office) recorded annual SO<sub>2</sub> concentrations of about 34 µg/m<sup>3</sup>, 31 µg/m<sup>3</sup> and 31 µg/m<sup>3</sup> respectively.

The AAQMS installed in Navi Mumbai region recorded SO<sub>2</sub> concentrations within 21 µg/m<sup>3</sup> to 30 µg/m<sup>3</sup> with DY patil, Nerul AAQMS recording 21 µg/m<sup>3</sup> and Airoli (30 µg/m<sup>3</sup>) having the highest levels among Navi Mumbai AAQMS. But all these levels were well below the annual standards of 50 µg/m<sup>3</sup>.

The cities of Nagpur, Nashik, Amravati, Aurangabad and Chandrapur recorded annual SO<sub>2</sub> concentrations less than 20 µg/m<sup>3</sup> and were relatively clean with respect to SO<sub>2</sub> pollution.

**Table No. 4: Trend of Annual Average of SO<sub>2</sub> concentrations recorded at Industrial Area CIDCO**

Financial Year	Annual Average of SO <sub>2</sub> (Annual Standard 50µg/m <sup>3</sup> )
13-14	48
14-15	82
15-16	80
16-17	78
17-18	47

Data source: Air Quality Status of Maharashtra 2016 – 17, MPCB

## Trend in Sulphur Dioxide concentrations in Maharashtra

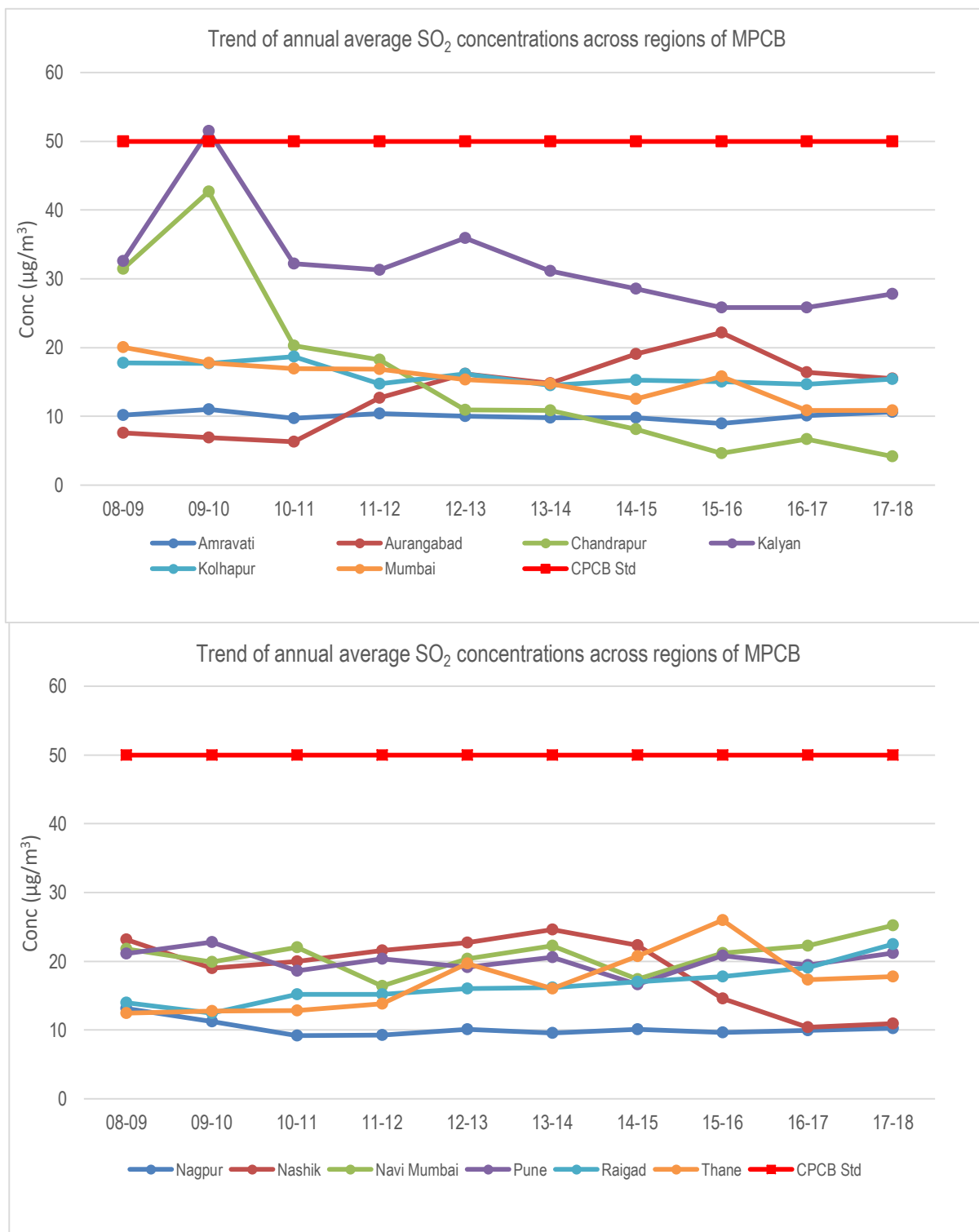


Figure No. 5: Trend in annual SO<sub>2</sub> concentrations across different regions

The SO<sub>2</sub> concentrations in Maharashtra have been below the annual standard (NAAQS 2009) across all the regions. As per the trend observed in Figure No. 5, Amravati, Kolhapur, Nagpur and Nashik regions are the cleanest for sulphur dioxide pollution. These regions have consistently, over the period of last 5 to 7 years, recorded annual SO<sub>2</sub> concentrations in the range of 10-20µg/m<sup>3</sup>. A declining trend in the sulphur dioxide pollution can be observed in Mumbai and Chandrapur regions.

The Kalyan region, comprising of the MIDC areas of Dombivali, Ambarnath and Badlapur has consistently recorded relatively high SO<sub>2</sub> concentrations as compared to other regions in the state. The region has recorded annual average SO<sub>2</sub> levels just near 30µg/m<sup>3</sup> from the past 5 years. In the year 2009-10 a peak can be observed when the region exceeded the annual standards for the SO<sub>2</sub> concentrations. Although annual concentrations for the region are under control upon doing a station wise analysis, the specific area with higher SO<sub>2</sub> concentrations which may be influencing the annual average could shortlisted.

The regions of Navi Mumbai, Raigad and Pune have recorded slight increasing trend of SO<sub>2</sub> concentration. All these regions are rapidly getting urbanized and industrialized. Hence, although the SO<sub>2</sub> concentrations are under the annual standard, appropriate measure should be undertaken to keep the emissions under check in these regions.

## Oxides of Nitrogen

Nitrogen oxides (NO<sub>x</sub>) are a mixture of gases composed of nitrogen and oxygen.

Two of the most toxicologically significant nitrogen oxides are nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). Nitric oxide has no colour, odour or taste and is non-toxic. In the air it gets rapidly oxidized to nitrogen dioxide. Nitrogen dioxide is a reddish-brown gas with a pungent, irritating odour.

In the presence of sunlight, the oxides of nitrogen react with the unburned hydrocarbons to form photochemical smog which causes damage to plants and is also detrimental to human health. These compounds play an important role in the atmospheric reactions that create ozone (O<sub>3</sub>) and acid rain<sup>#</sup>.

### Sources:

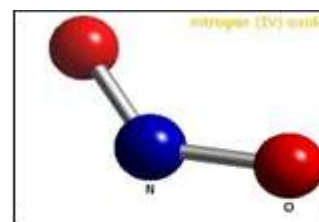
- Natural: Lighting, forest fires and bacterial activity
- Anthropogenic: High temperature combustion (internal combustion engines, fossil fuel-fired power stations, industrial), burning of bio-mass and fossil fuels.

### Effects:

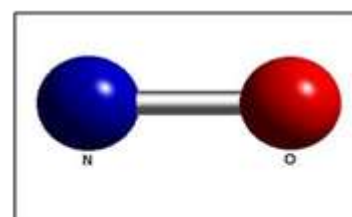
- Human Health: Irritation of nose and throat, reduced lung function, bronchitis in asthmatic children, visibility impairment, swelling of tissues in the throat and upper respiratory tract, reduced oxygenation of body tissues.
- Environment: Acid rain, precursor for photochemical smog, eutrophication in water bodies

## NO<sub>x</sub> compounds\*

- Nitrous oxide (N<sub>2</sub>O)
- Nitric Oxide (NO)
- Nitrogen Dioxide (NO<sub>2</sub>)
- Dinitrogen pentaoxide (N<sub>2</sub>O<sub>5</sub>)



**Common Name:** Nitrogen Dioxide  
**Molecular Formula :** NO<sub>2</sub>  
**Life span in air :** 1-7 days  
**Nature :** Polar



**Common Name :** Nitric Oxide  
**Molecular Formula :** NO  
**Life span in air :** 1-7 days  
**Nature :** Polar

\*[http://www.chemeddl.org/alfresco/service/org/chemeddl/ttoc/ttoc\\_results/?id=3942&mode=primary&type=molecule&num\\_results=&guest=true](http://www.chemeddl.org/alfresco/service/org/chemeddl/ttoc/ttoc_results/?id=3942&mode=primary&type=molecule&num_results=&guest=true)

# Agency for Toxic Substances and Disease Registry, U.S. Department of health and human services, Public Health Service, (April 2002)

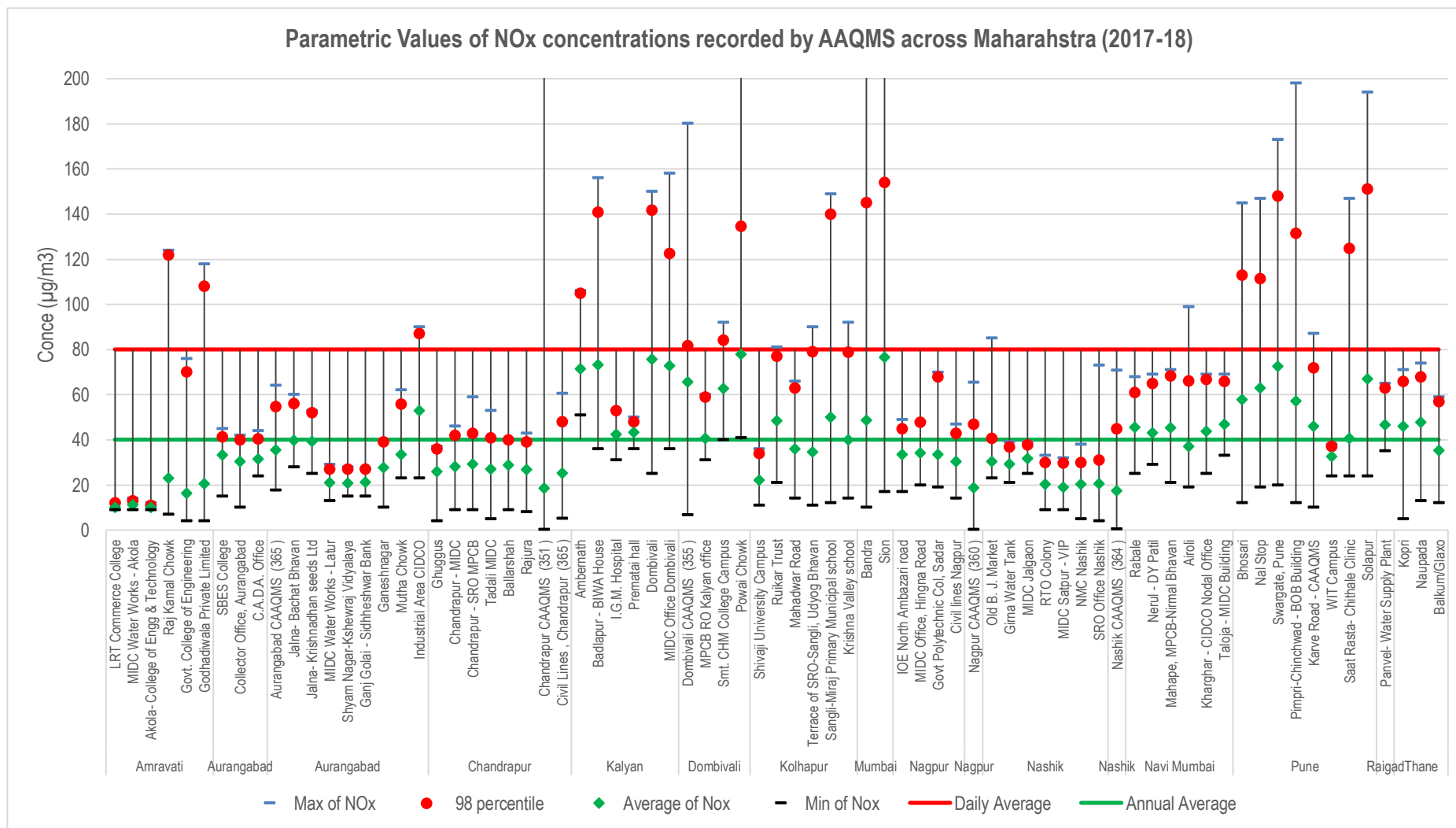


Figure No. 6: Parametric values of NOx concentrations recorded by AAQMS across Maharashtra (2017-18)



Compared to 32 AAQMS in 2016-17, 29 AAQMS in the year 2017-18 across Maharashtra recorded higher NO<sub>x</sub> concentrations than the annual concentration standard of 40µg/m<sup>3</sup>. As seen in Figure No. 6, ([refer Annex-2 for datasets](#)) list of stations which recorded annual NO<sub>x</sub> concentrations of 40µg/m<sup>3</sup> or higher.

Due to the presence of industrial areas, all the 10 AAQMS in Kalyan region exceeded the annual NO<sub>x</sub> standard (40µg/m<sup>3</sup>) and the AAQMS at Powai Chowk with levels of 78 µg/m<sup>3</sup>, recorded the highest annual average NO<sub>x</sub> concentration. Sion AAQMS from Mumbai region recorded the second highest NO<sub>x</sub> concentration of 77 µg/m<sup>3</sup>.

All the 5 AAQMS in and near Pune city exceeded the annual NO<sub>x</sub> standard (40µg/m<sup>3</sup>) and the AAQMS at Swargate, Pune recorded the third highest annual average NO<sub>x</sub> concentration of about 73 µg/m<sup>3</sup>. But compared to the level in 2016-17 (82 µg/m<sup>3</sup>), the latest recordings show a decrease of almost 9 µg/m<sup>3</sup>. A similar trend was observed in Nal stop AAQMS with a decrease in NO<sub>x</sub> levels from 79µg/m<sup>3</sup> in 2016-17 to 63 µg/m<sup>3</sup> in 2017-18. Pimpri-Chinchwad BOB building recorded NO<sub>x</sub> levels of about 57 µg/m<sup>3</sup>.

In Solapur region, except for WIT campus, Saat rasta and Solapur AAQMS exceeded the standards by recording NO<sub>x</sub> levels at 42 µg/m<sup>3</sup> and 62 µg/m<sup>3</sup>. A Similar trend was observed in the Thane region where except for Balkum, Kopri and Naupada AAQMS recorded higher levels of 46 µg/m<sup>3</sup> and 48 µg/m<sup>3</sup> respectively.

With the exception of Airoli, 5 AAQMS in Navi mumbai recorded higher NO<sub>x</sub> concentrations. The cities of Amravati, Latur, Chandrapur, Nagpur and Nashik have reported annual NO<sub>x</sub> concentrations less than 40 µg/m<sup>3</sup>.

**Table No. 5: Top ten stations which exceeded NO<sub>x</sub> annual standard (40µg/m<sup>3</sup>) in 2017-18**

Sr No	MPCB RO	City	Station Name	Number of days of observations	Average (µg/m <sup>3</sup> )
1	Kalyan	Ulhasnagar	Powai Chowk	83	78
2	Mumbai	Sion	Sion	226	77
3	Kalyan	Dombivali	Dombivali	76	76
4		Badlapur	BIWA House	90	73
5		Dombivali	MIDC Office Dombivali	113	73
6	Pune	Pune	Swargate, Pune	101	73
7	Kalyan	Ambernath	Ambernath	99	72
8	Pune	Solapur	Solapur	335	67
9	Kalyan	Ulhasnagar	Smt. CHM college campus	98	63
10	Pune	Pune	Bhosari	101	58

## Trend in Nitrogen Dioxide concentrations in Maharashtra

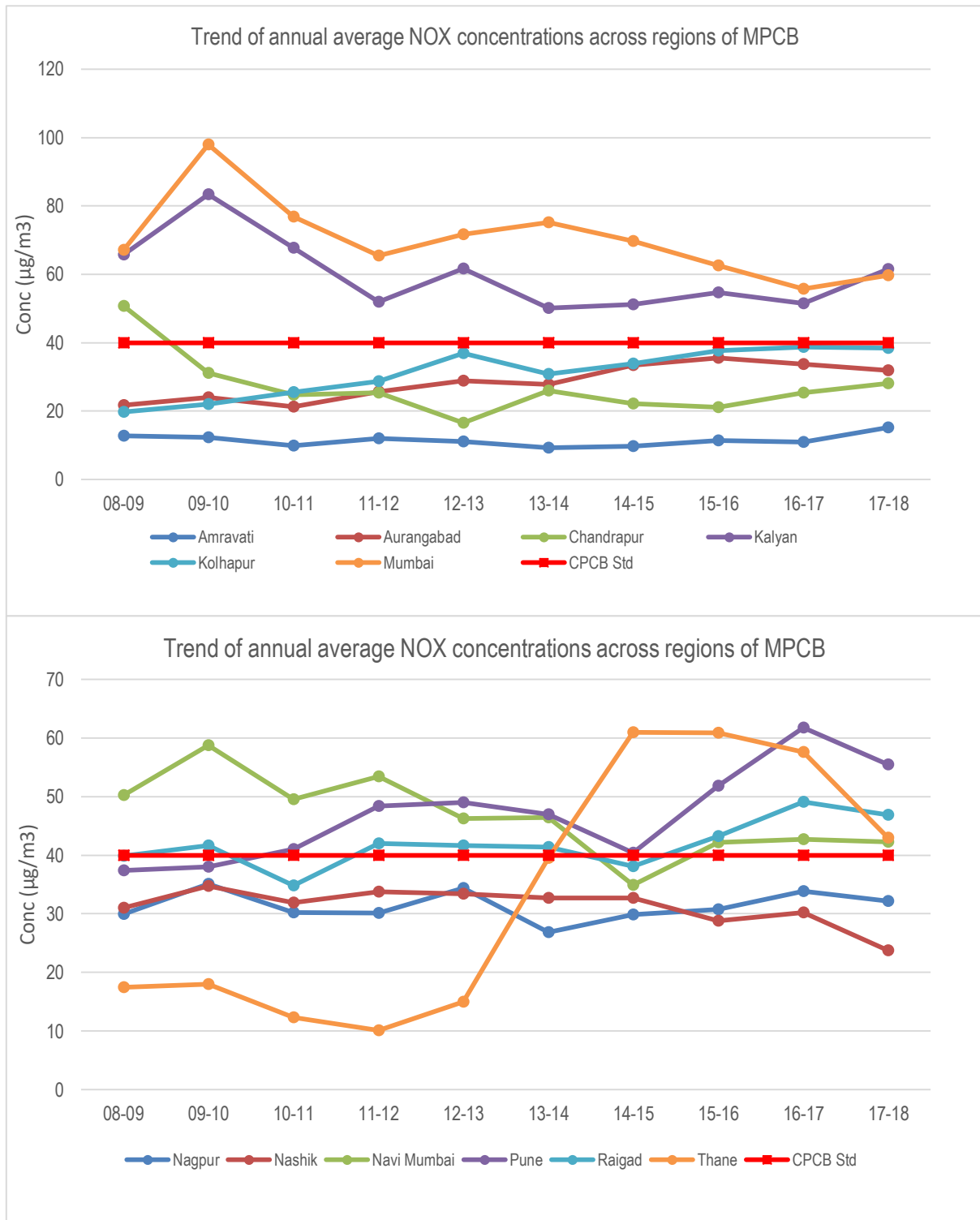


Figure No. 7: Trend in Nitrogen Dioxide concentrations in Maharashtra

As seen in **Figure No. 7** the NO<sub>x</sub> levels for Kolhapur, Aurangabad, Chandrapur, Amravati, Nashik and Nagpur are below the CPCB standards indicating that the air in those regions is less polluted with NO<sub>x</sub> pollution while the most urbanised and industrialised regions of the state like Mumbai, Kalyan, Navi Mumbai, Thane are the ones which are severely affected by high NO<sub>x</sub> concentrations.

In the past ten years the Mumbai region has recorded annual NO<sub>x</sub> concentrations in the range of 60-80µg/m<sup>3</sup> which is almost double than the annual standard (40µg/m<sup>3</sup>). The Kalyan region which has major MIDC areas recorded the second highest annual concentrations for NO<sub>x</sub> concentrations in range of 50-80µg/m<sup>3</sup> in the last five years.

Although having high NO<sub>x</sub> concentrations at Thane and Pune in 2017-18, the levels of NO<sub>x</sub> in both cities reduced from 58µg/m<sup>3</sup> to 43µg/m<sup>3</sup> and 62µg/m<sup>3</sup> to 55µg/m<sup>3</sup> respectively compared to last year. Raigad region in the past three years has been a borderline case and exceeded the annual standard.

Although Navi Mumbai region was recorded with high NO<sub>x</sub> concentrations until 2012-13, a decrease in the NO<sub>x</sub> levels has been observed over the past three years attaining average levels close to CPCB standards. A sudden decrease in the NO<sub>x</sub> concentrations in the Thane region is very striking for the past three years reaching up to 43µg/m<sup>3</sup> in 2017-18 to from 61µg/m<sup>3</sup>.in 2014-15.

## Particulate Matter

Particulate matter (PM) is a complex mixture of extremely small particles and liquid droplets made up of a number of components, including acids (nitrates and sulphates), organic chemicals, metals and soil or dust particles\*.

These particles may vary in sizes and chemical compositions. The smaller the particles, the more easily and deeply they can enter our lungs resulting in health problems.

### Sources:

- Natural: Volcanoes, dust storms, forest and grassland fires, living vegetation, and sea spray
- Anthropogenic: Power plants and industrial processes, vehicular traffic, domestic coal burning, industrial and municipal waste incinerators.

### Effects:

- Human Health: Premature death, aggravated asthma, acute respiratory symptoms including aggravated coughing and difficult or painful breathing, chronic bronchitis and decreased lung function.
- Vegetation: Can clog stomatal openings of plants and interfere with the function of photosynthesis.

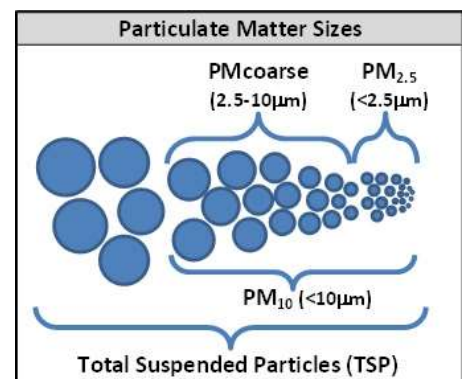
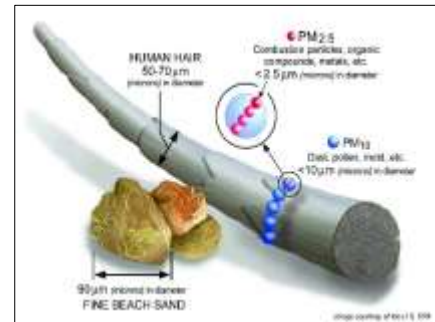


Image Source:

[https://www4.des.state.nh.us/appc/?page\\_id=138](https://www4.des.state.nh.us/appc/?page_id=138)

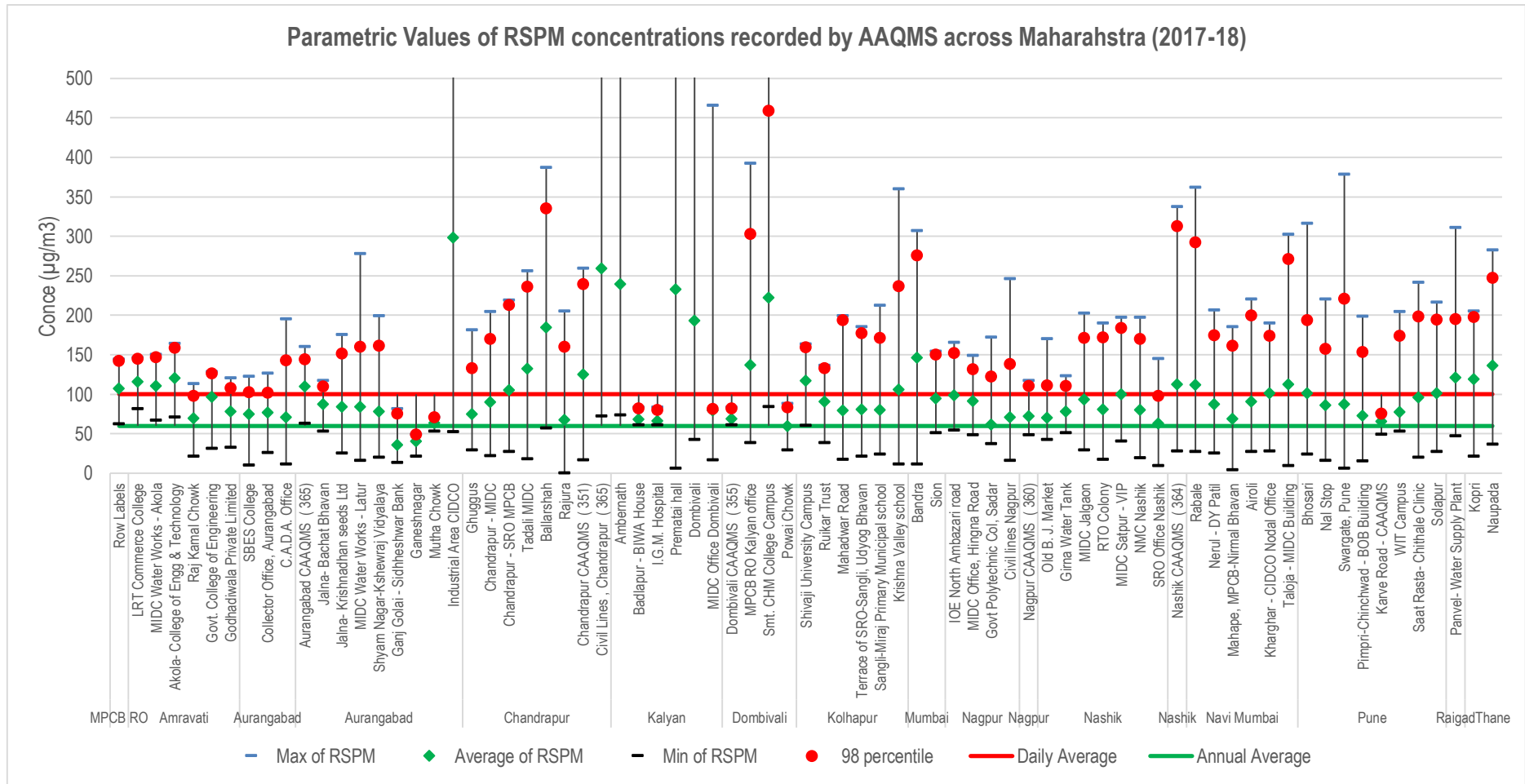


Figure No. 8: Parametric values of RSPM (PM<sub>10</sub>) concentrations recorded by AAQMS across Maharashtra (2017-18)

RSPM levels are always a cause of concern for Maharashtra as it is one of the most persistent reasons for increasing air pollution and responsible for increase in air pollution in Maharashtra. Compared to the previous year (2016-17) in which only 1 active AAQMS (Airoli, Navi Mumbai) had annual RSPM levels under the prescribed standards ( $60 \mu\text{g}/\text{m}^3$ ), this year recorded 3 such AAQMS having Annual RSPM levels under the standard. These stations are mentioned in Table No. 6.

**Table No. 6: List of AAQMS stations having Annual RSPM levels under the standards in 2017-18**

Station Name	Region	2016-17		2017-18	
		Number of observations	Annual RSPM level	Number of observations	Annual RSPM level
Ganeshnagar	Aurangabad	104	79	103	35
Mutha Chowk		96	113	103	40
Shivaji University Campus	Kolhapur	92	61	104	60

Continuous air monitoring revealed that the Ghuggus area in Chandrapur has always seen RSPM recordings reach critical levels thereby making the air quality highly polluted. In 2017-18, annual RSPM level recorded by the Ghuggus AAQMS is  $298 \mu\text{g}/\text{m}^3$  (nearly 5 times more than the standard of  $60 \mu\text{g}/\text{m}^3$ ) which was  $242 \mu\text{g}/\text{m}^3$  in the year 2016-17. It indicates a very high level of air pollution in the area which needs to be addressed urgently.

Due to the presence of industrial complexes having numerous chemical manufacturing units, RSPM levels are always on the higher end in Dombivali, Ambernath, Ulhasnagar area coming under the Kalyan region. The AAQMS of these sites recorded less number of observations compared to previous year but the RSPM levels had almost doubled. In 2017-18, Dombivali, Powai Chowk and Ambernath AAQMS recorded RSPM levels of  $233 \mu\text{g}/\text{m}^3$ ,  $222 \mu\text{g}/\text{m}^3$  and  $259 \mu\text{g}/\text{m}^3$  respectively, much higher than the recordings of  $112 \mu\text{g}/\text{m}^3$ ,  $108 \mu\text{g}/\text{m}^3$  and  $123 \mu\text{g}/\text{m}^3$  respectively in the previous year. Effective measures are needed to be taken to reduce these levels and to elevate the quality of air.

In the Mumbai region, both Bandra and Sion AAQMS recorded a slight improvement in RSPM levels with annual average concentration of  $106 \mu\text{g}/\text{m}^3$  and  $146 \mu\text{g}/\text{m}^3$  compared to levels of  $124 \mu\text{g}/\text{m}^3$  and  $152 \mu\text{g}/\text{m}^3$  respectively, recorded in the previous year. All 3 AAQMS sites in neighbouring Thane region, namely Kopri, Naupada and Balkum/Glaxo AAQMS recorded almost double the levels of annual standards with recorded RSPM levels of  $121 \mu\text{g}/\text{m}^3$ ,  $119 \mu\text{g}/\text{m}^3$  and  $136 \mu\text{g}/\text{m}^3$  respectively.

Similarly, all three AAQMS (College of Engg & Technology, MIDC water works and LRT Commerce College) in Akola city recorded RSPM concentrations between  $110-116 \mu\text{g}/\text{m}^3$ . Amravati (Raj Kamal Chowk) also exceeded the annual standard level by double ( $120 \mu\text{g}/\text{m}^3$ ), indicating that on all the given observation days the site and its nearby locations were severely affected by RSPM concentrations. A list of the Inferior sites of these has been enlisted in Table No. 7.

**Table No. 7: Ten Inferior sites with AAQMS which recorded the highest minimum daily RSPM concentrations in 2017-18**

Sr No	Station Name	Region	Minimum daily concentrations ( $\mu\text{g}/\text{m}^3$ )	Annual Average concentrations ( $\mu\text{g}/\text{m}^3$ )
1	Ghuggus	Chandrapur	52	298
2	Ambernath	Ambernath	72	259
3	BIWA House	Badlapur	73	240
4	Dombivali	Dombivali	6	233
5	Powai Chowk	Ulhasnagar	84	222
6	MIDC office	Dombivali	42	193
7	Rajura	Chandrapur	57	185
8	Sion	Mumbai	11	146
9	Balkum	Thane	36	136
10	Smt. CHM college campus	Ulhasnagar	38	137

The PM concentrations across all the regions in Maharashtra have been very high (Figure No. 9) and have consistently exceeded the standards ( $60\mu\text{g}/\text{m}^3$ ) from the past decade. Even the regions with low  $\text{SO}_2$  and  $\text{NO}_x$  concentrations have recorded high RSPM concentration.

Mumbai, Kalyan and Chandrapur regions are amongst the most highly polluted regions for RSPM concentrations. Although one may note a declining trend in RSPM concentrations in Mumbai region, the annual concentrations across the past ten years have been almost two to three times the annual standard. The Chandrapur region has also recorded high RSPM concentrations in the range of  $100\text{-}150\mu\text{g}/\text{m}^3$ . The Chandrapur region has major power plants, cement manufacturing and coal mining activities. These activities could be attributed to high RSPM concentrations in the region.

Thane has in the past three years recorded an inclining trend for annual RSPM concentrations. Whereas, the RSPM concentrations in the Nagpur and Nashik regions have been in the range of  $70\text{-}100\mu\text{g}/\text{m}^3$ .

### Trend in RSPM concentrations in Maharashtra

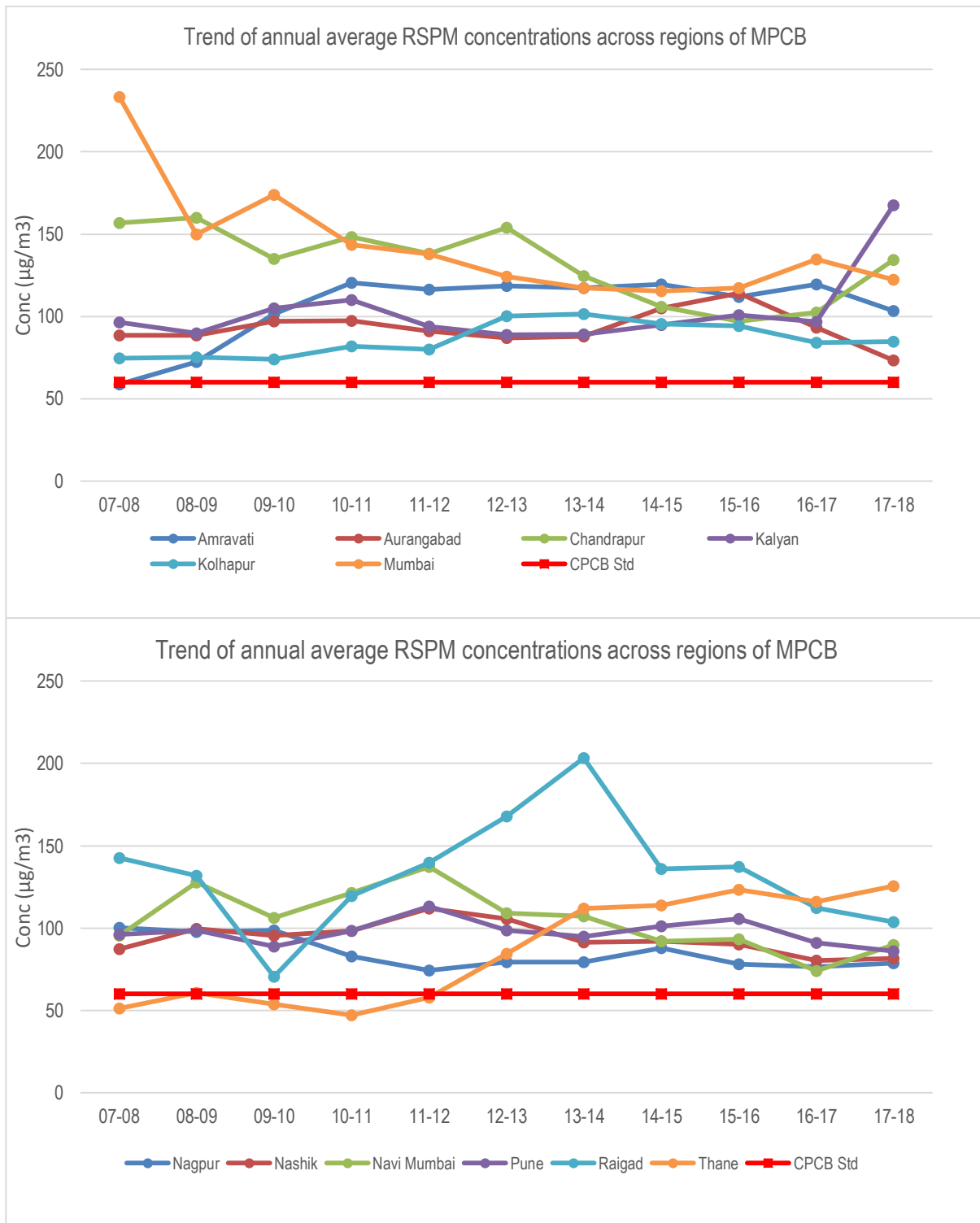


Figure No. 9: Trend in RSPM concentrations in Maharashtra



## Ozone

Ozone (O<sub>3</sub>), a pale blue gas molecule, is composed of three oxygen atoms and has a pungent smell.

Ozone is found naturally in small concentrations in the stratosphere, a layer of Earth's upper atmosphere which shields us from much of the sun's ultraviolet radiation.

Ozone is also found in troposphere (Earth's lower atmosphere), is man-made, a result of air pollution from internal combustion engines and power plants. Hence, this ozone is also known as bad ozone.

The Tropospheric ozone is a 'secondary' pollutant formed from gases such as nitrogen oxides and volatile organic compounds in the presence of solar light.

### Sources

Ozone precursors come from fuel combustion due to automobiles; oil based and paint industries, power plant, oil refineries, and electronic equipment such as photocopiers.

### Effects

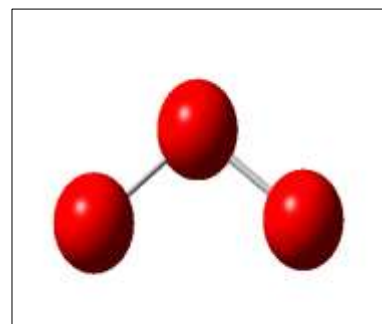
Human Health:

Reduce lung function, respiratory illnesses, premature death, asthma, bronchitis, heart attack, and other cardiopulmonary problems.

Environment: Photochemical Smog

**Reference Source:** [https://www.epa.gov/ozone-pollution/basic-information-about-ozone#what where how.](https://www.epa.gov/ozone-pollution/basic-information-about-ozone#what%20where%20how)

<https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution>



**Common Name:** Ozone  
**Molecular Formula:** O<sub>3</sub>  
**Life span in air:** 22+/-2 days.  
**Nature:** Polar

Image Source:

<https://www.pinterest.co.uk/pin/507147608019816822/>

India accounts for highest number of premature deaths due to ozone pollution.

As per the State of Global Air 2017 report, released in Boston on Tuesday, as many as **2.54 lakh** deaths occurred in 2015 on account of exposure to ozone and its impact on chronic lung disease.

.....Times of India, Feb 15, 2017.....

(<https://timesofindia.indiatimes.com/home/enviro>)

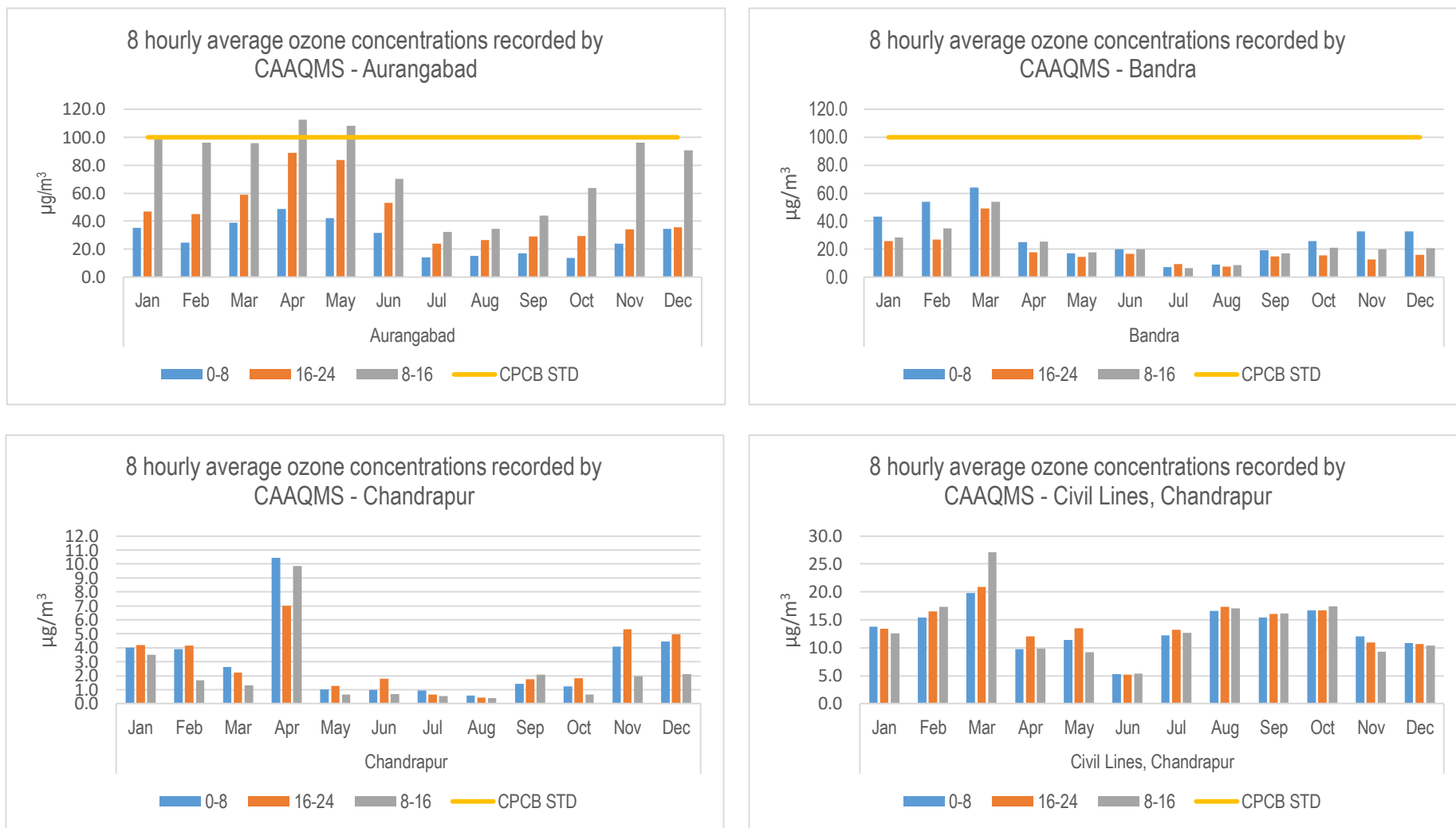


Figure No. 10: 8- hourly monthly average O<sub>3</sub> concentrations recorded by CAAQMS in Aurangabad, Bandra , Chandrapur and Civil Lines, Chandrapur

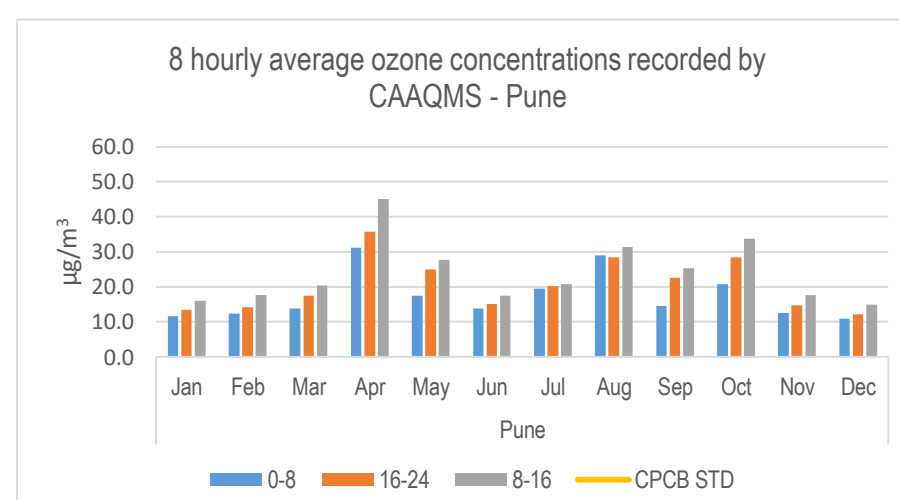
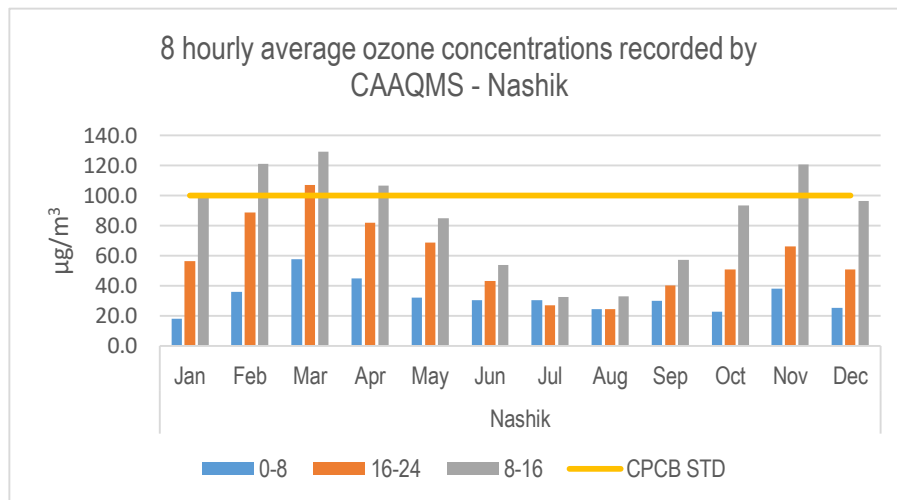
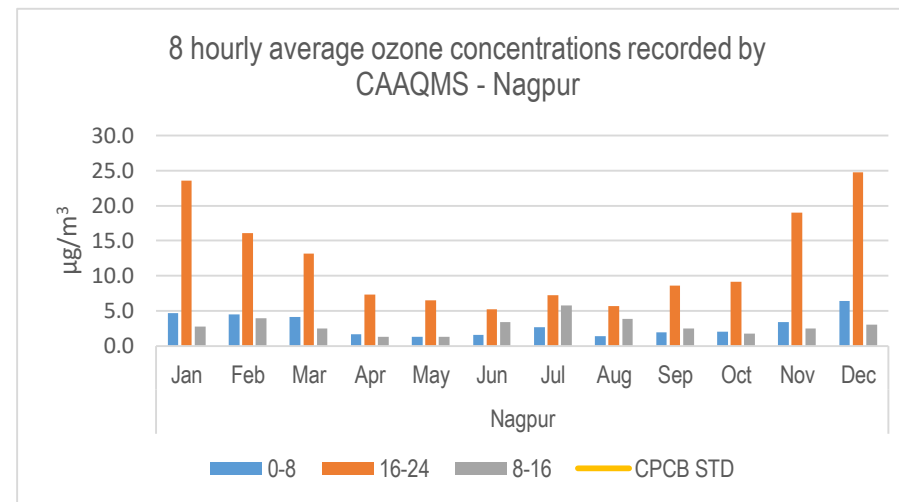
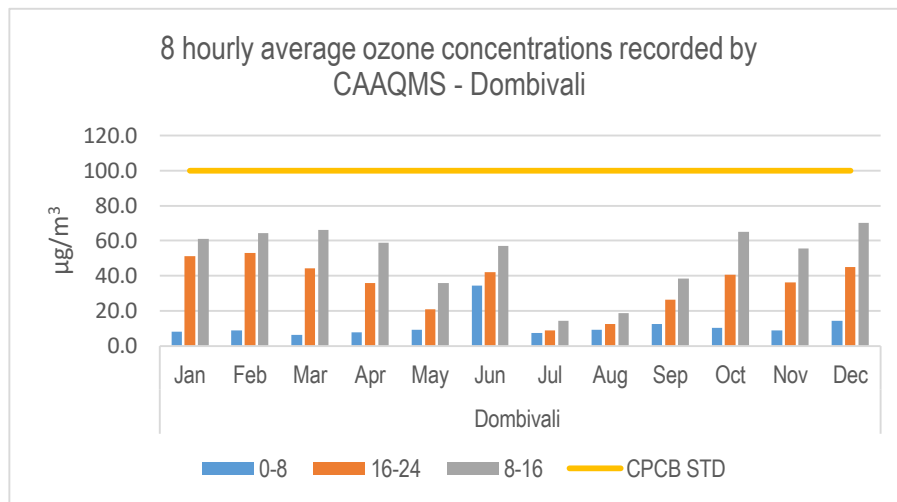
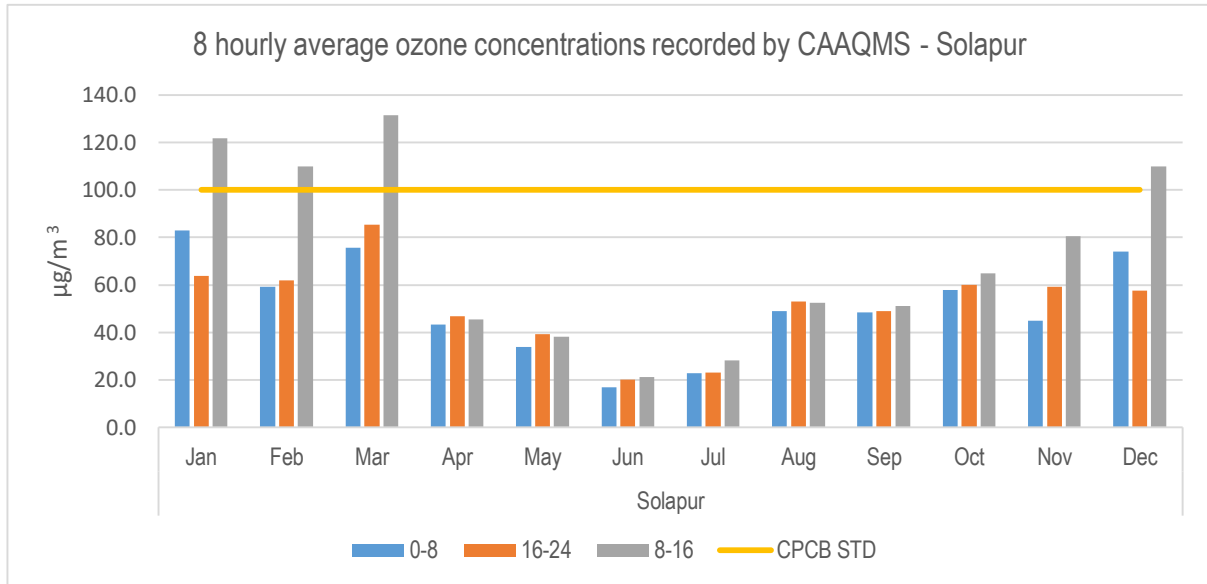


Figure No. 11: 8- hourly monthly average O3 concentrations recorded by CAAQMS at Dombivali, Nagpur, Nashik and Pune



**Figure No. 12: 8- hourly monthly average O<sub>3</sub> concentrations recorded by CAAQMS at Solapur**

Ozone concentrations were monitored at the 9 CAAQMS in Maharashtra and more than eight thousand readings have been recorded across all stations. Figure No. 10 to Figure No. 12 states the 8 hourly monthly averages of Ozone Concentrations across the CAAQMS in Maharashtra.

In the year 2017-18, CAAQMS installed at Aurangabad, Nashik and Solapur recorded a higher O<sub>3</sub> concentration. In the month of April and May, Aurangabad CAAQMs recorded nearly 10% high O<sub>3</sub> concentration than the prescribed standard of 100 µg/m<sup>3</sup> whereas it was at the higher end of the standard during the months of January, February, March and November.

In case of Nashik, however, almost 10 to 20% increase in the O<sub>3</sub> concentration was observed from April to May and in November while concentration level reached close to the standard value of 100 µg/m<sup>3</sup> during the months of January, October and December.

In Solapur, the months of January (121.9 µg/m<sup>3</sup>), February (110 µg/m<sup>3</sup>), March (131.4 µg/m<sup>3</sup>) and December (110 µg/m<sup>3</sup>) recorded a higher O<sub>3</sub> concentration while the concentration was within the standard of 100 µg/m<sup>3</sup> during the rest of the year.

The CAAQMS installed at Bandra, Chandrapur, Civil lines-Chandrapur, Dombivali, Nagpur and Pune recorded O<sub>3</sub> concentrations that were within the prescribed standard limit of 100 µg/m<sup>3</sup>.

Thus, in terms of ozone pollution the cities of Nashik, Solapur and Aurangabad need to implement strategies to reduce the ozone pollution.

## Carbon Monoxide

Carbon Monoxide (CO) is a colourless, odourless, tasteless, non-irritating and poisonous gas consisting of one carbon and one oxygen atom, connected by a triple bond.

Partial oxidation of carbon-containing compounds leads to production of CO, majorly from exhausts of internal combustion engines, especially by motor vehicles with petrol engines. About 60% of the carbon Monoxide is attributed by human activities whereas natural processes account for the remaining 40%.

CO is absorbed through the lungs into the blood and combines with hemoglobin to form carboxyhemoglobin (COHb). CO binds to hemoglobin more strongly than oxygen. COHb cannot transport oxygen, thus depriving tissues and organs of oxygen which can be fatal. CO also reacts with other compounds in the atmosphere thus converting to carbon dioxide.

### Sources:

- Natural: Volcanoes and forest fires
- Anthropogenic: Emissions from automobiles, coal- gas or oil-fired heating or power generating plants, combustion of waste in municipal and other incinerators, burning of forest and agricultural materials, smoldering coal refuse material.

### Effects:

Dizziness, nausea (feeling sick) and vomiting, tiredness and confusion, stomach pain, shortness of breath and difficulty in breathing, blue baby syndrome.

Reference:

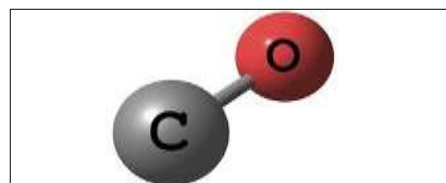
U.S. Department of Health And Human Services Public Health Service Agency for Toxic Substances and Disease Registry, [Toxicological Profile For Carbon Monoxide](#), Page 2

WHO [Environmental Health Criteria 213: Carbon Monoxide \(second edition\)](#), Sources of carbon monoxide. Page 38

T. Greiner, Department of Agricultural and Biosystems Engineering, Iowa State University, [Carbon Monoxide Poisoning: Dangers, Detection, Response, and Poisoning \(AEN-193\)](#)

M. Fierro, The University of Arizona, College of Public Health, [Adverse Health Effects Of Exposure To Ambient Carbon Monoxide](#) (September 2001), Page 4

<https://www.des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-ehp-20.pdf>



**Common Name:** Carbon Monoxide  
**Molecular Formula:** CO  
**Life span in air:** 2 months  
**Nature:** Polar

**Effects of COHb levels in blood of healthy subjects [Adapted from WHO,(1999)]**

COHb (%)	Effect
<2	Small Decreases in work Capacity
5	Decrease of Oxygen uptake and exercise performance ;decrements in neurobehavioral function
10	Shortness of breath on vigorous exertion; possible tightness across the forehead; dilation of cutaneous blood vessel
20	Shortness of breath on moderate exertion ;occasional headache with throbbing in temples
30	Decided headache; irritable ;easily fatigued; judgment disturbed; possible dizziness ;dimness of vision
40-50	Headache ;confusion; collapse; Fainting on exertion
60-70	Unconsciousness ; intermittent convulsion ;respiratory failure; death if

Data Source:

([http://www.scielo.br/scielo.php?script=sci\\_ar\\_text&nid=51678-58782008000300011](http://www.scielo.br/scielo.php?script=sci_ar_text&nid=51678-58782008000300011))

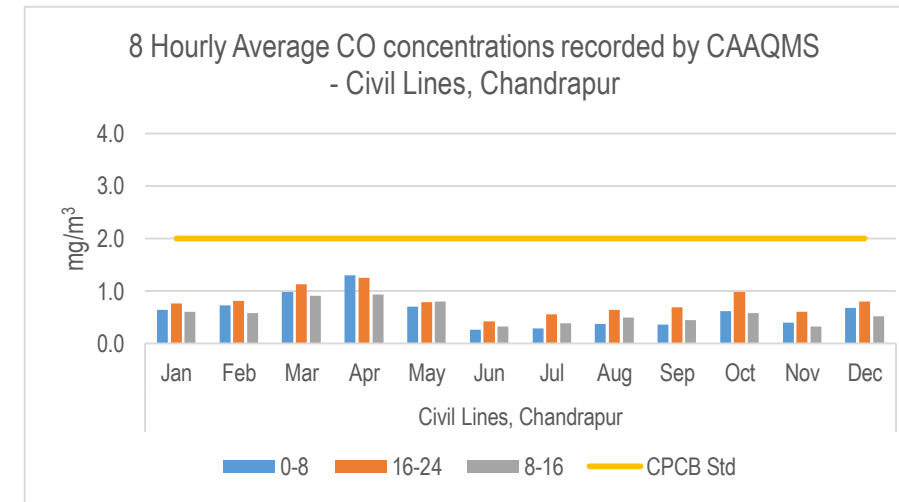
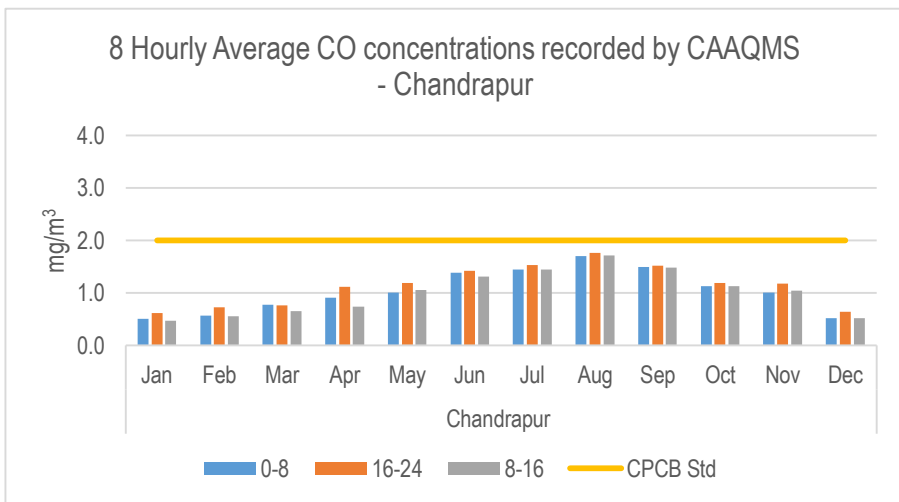
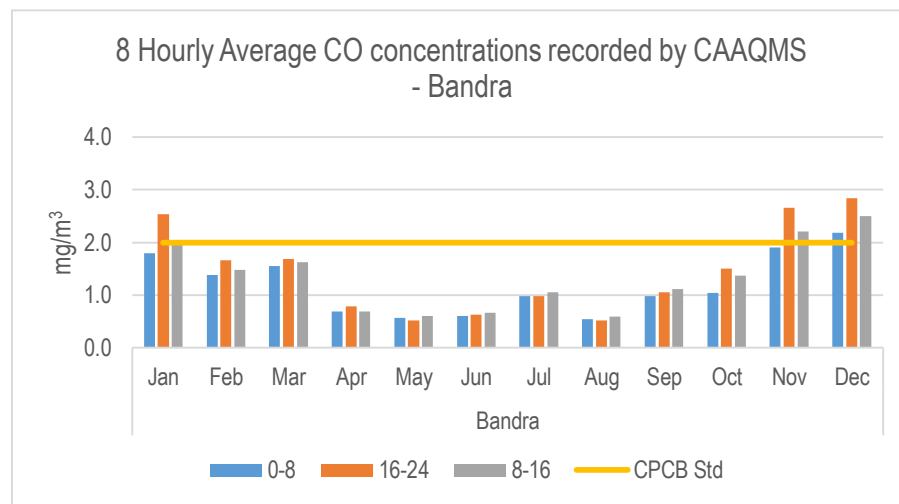
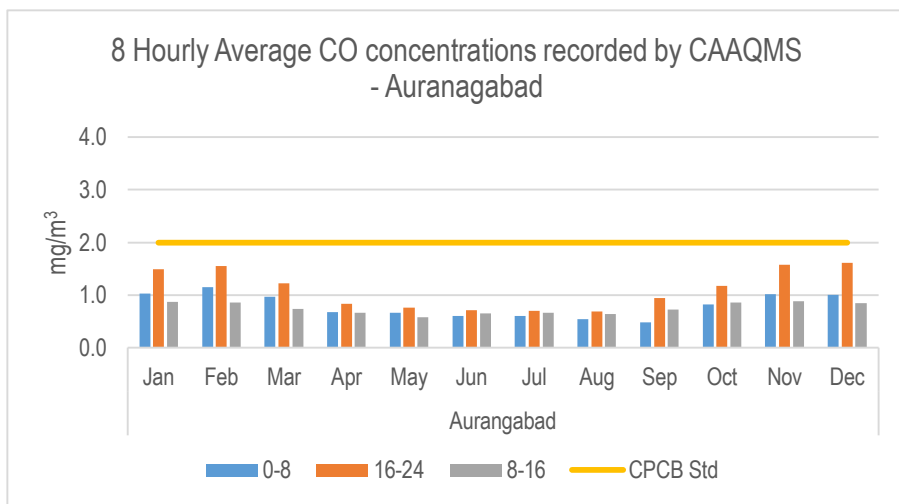


Figure No. 13: 8- hourly average CO concentrations recorded by CAAQMS at Aurangabad, Bandra, Chandrapur and Civil Lines, Chandrapur

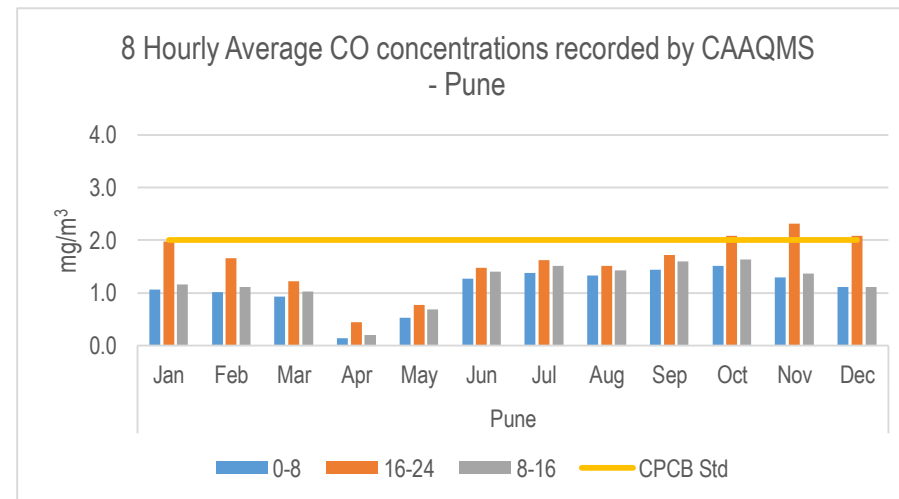
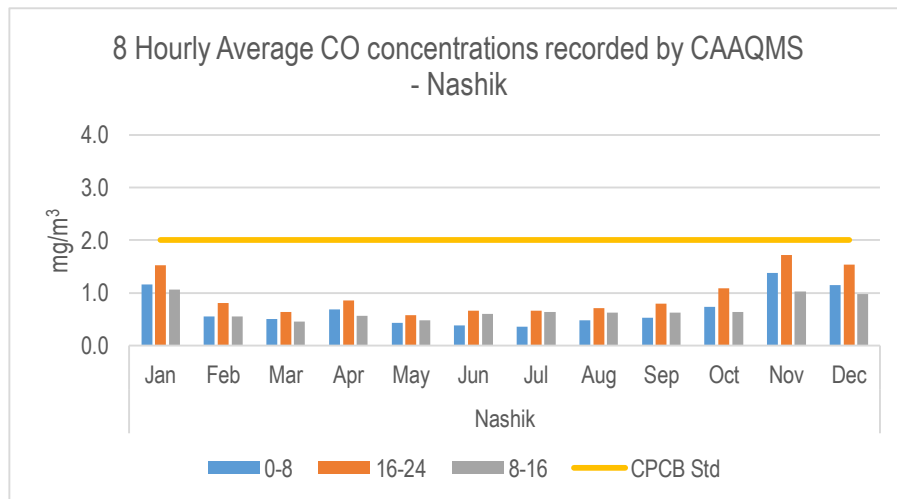
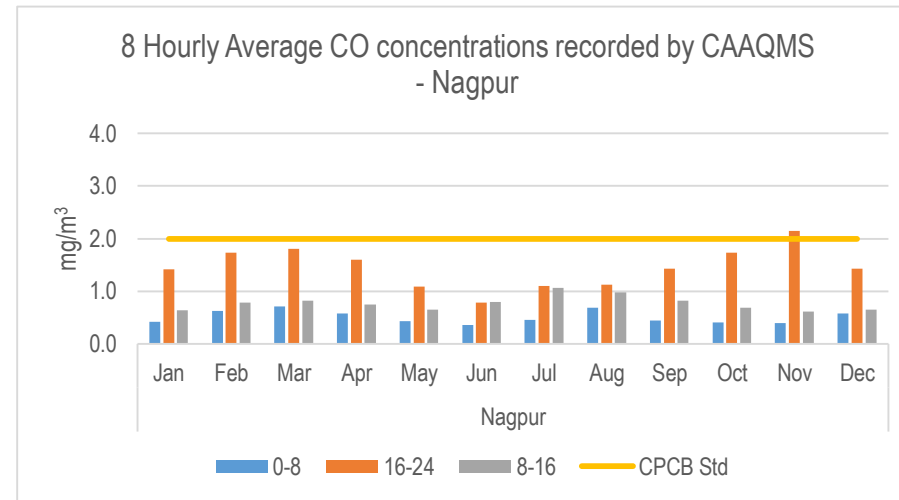
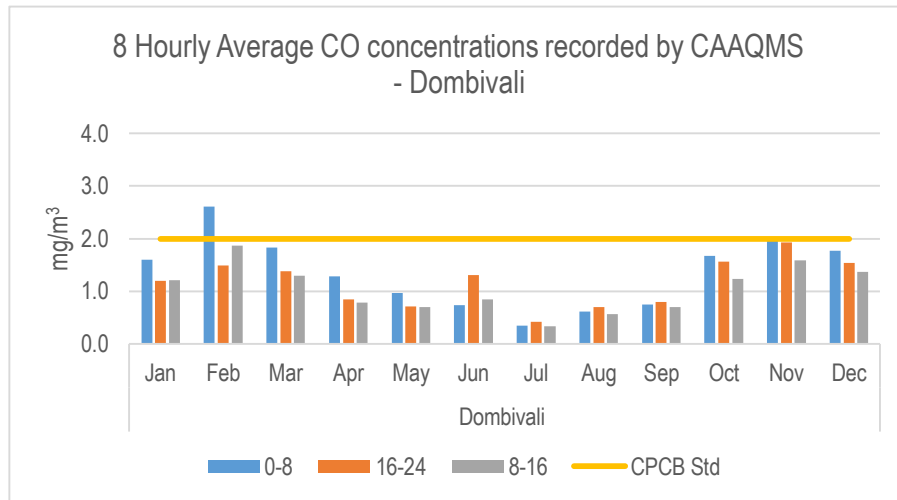
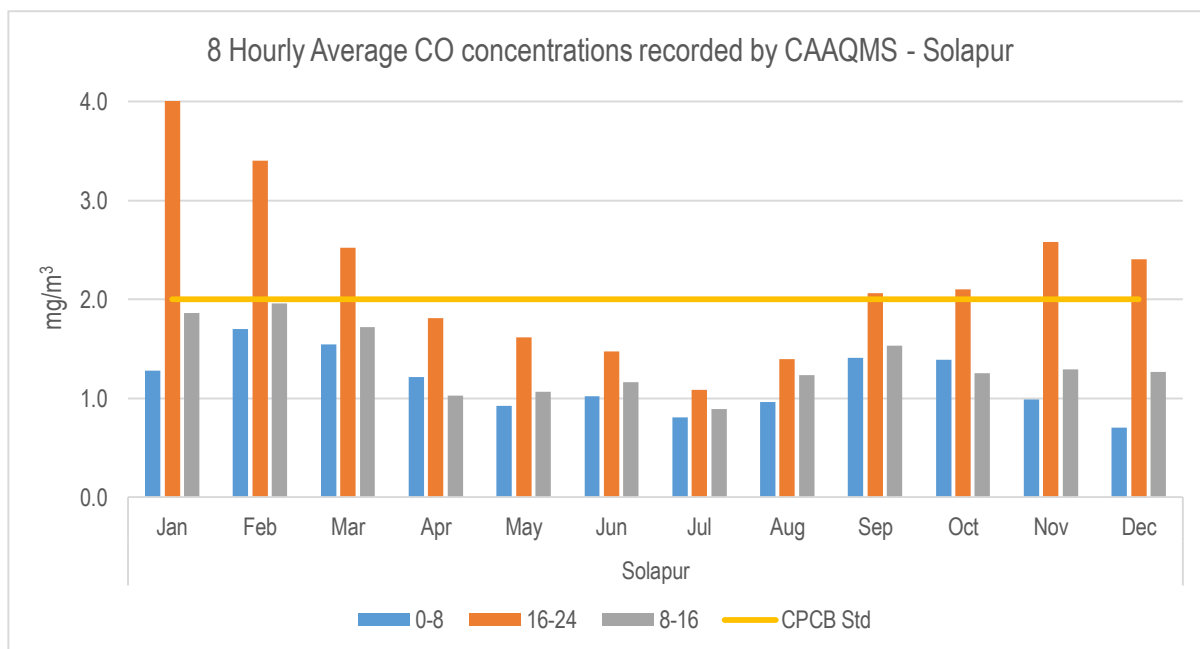


Figure No. 14: 8- hourly average CO concentrations recorded by CAAQMS at Dombivali, Nagpur, Nashik and pune



**Figure No. 15: 8- hourly average CO concentrations recorded by CAAQMS at Solapur**

Carbon Monoxide concentrations were recorded at 9 CAAQMS as enlisted in and graphically depicted in Figure No. 13, Figure No. 14 and Figure No. 15. From the figures, it is clear that Bandra, Dombivali, Nagpur, Pune and Solapur violated 8 hourly concentration standards of 2 mg/m<sup>3</sup>.

Bandra CAAQMS recorded CO concentration which was more than 25% of the prescribed standard of 2 mg/m<sup>3</sup> in January and during the winter months of November and December whereas Dombivali CAAQMS recorded higher CO only in the month of February but in November the concentration touched the standard mark of 2 mg/m<sup>3</sup>.

The CO concentration was well within the standard limit in Nagpur for the whole year except in the month of November when it increased slightly and reached to 2.1 mg/m<sup>3</sup>. Similarly, Pune CAAQMS recorded a slightly higher concentration in the winter months of October (2.1 mg/m<sup>3</sup>), November (2.3 mg/m<sup>3</sup>), December (2.1 mg/m<sup>3</sup>) and January when it touched the standard limit of 2 mg/m<sup>3</sup>

Among all locations, CAAQMS at Solapur recorded the highest concentration of CO in the month of January with nearly double the amount of CO (4 mg/m<sup>3</sup>) than the standard level. The CO concentration was high from January to March and from September to December. Thus, Solapur recorded a higher CO level in 7 months out of 12. The problem needs to be addressed and the CO concentration level brought down.

The CAAQMS installed at Aurangabad, Chandrapur, Civil lines - Chandrapur and Nashik recorded CO concentrations that were within the prescribed standard limit of 2 mg/m<sup>3</sup>.

Thus, in terms of carbon monoxide pollution, the cities of Bandra, Dombivali, Nagpur, Pune and Solapur need to implement strategies to reduce the carbon monoxide pollution.



## Benzene

Benzene belongs to the family of aromatic hydrocarbons which are nonpolar molecules and are usually colorless liquids or solids with a characteristic aroma.

It is a colorless sweet smelling liquid and is generated whenever carbon-rich materials undergo incomplete combustion. It is highly toxic and is a known carcinogen; exposure to it may cause leukemia.

### Sources:

Natural: Volcanoes and Forest fires.

Anthropogenic: Combustion of aromatic compounds, evaporation during fuelling, tobacco smoke, furniture wax and glue paints are some of the major sources of benzene pollution.

### Effects

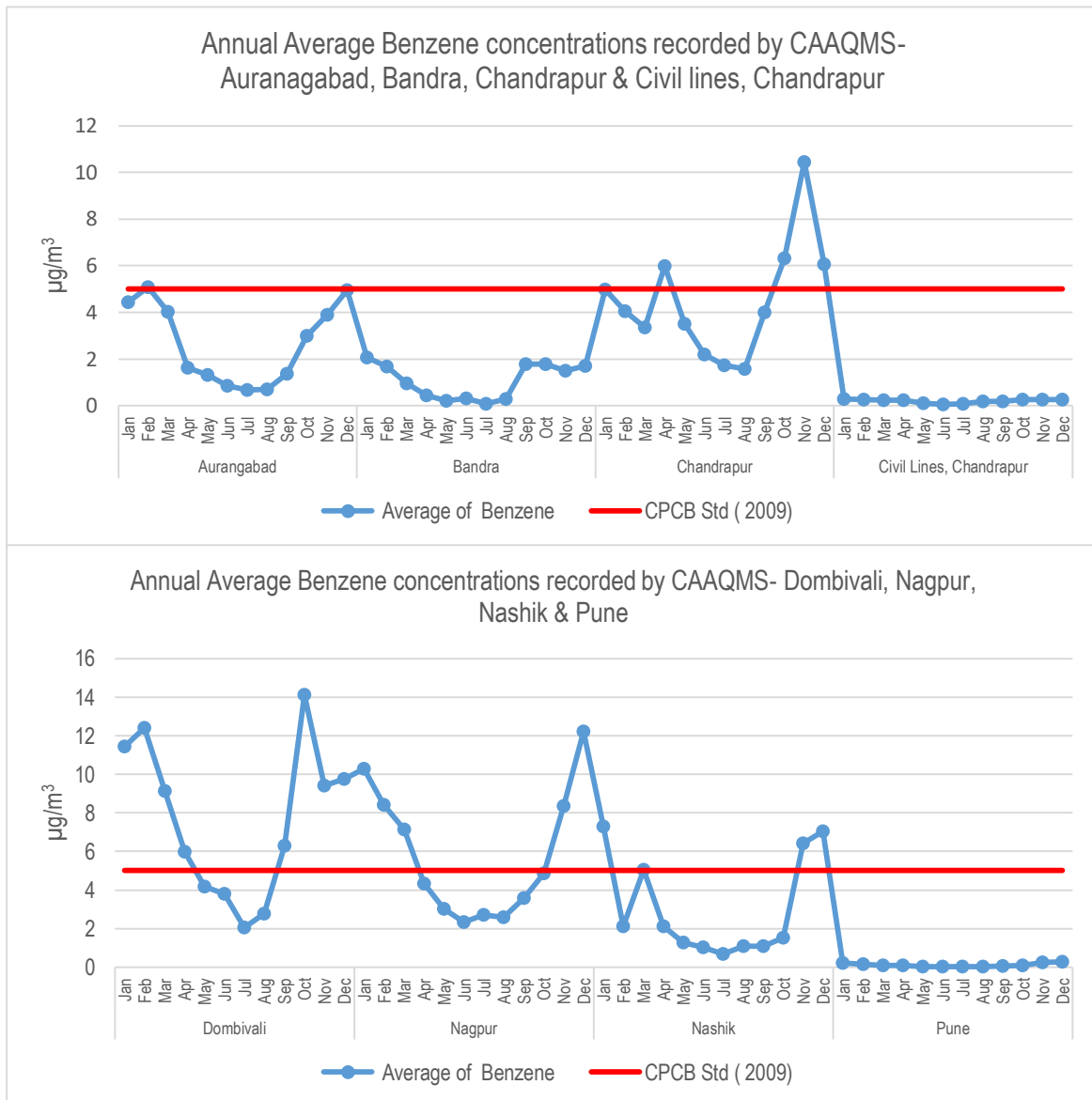
Benzene increases the risk of cancer and other illnesses. Benzene is a notorious cause of bone marrow failure.

Substantial quantities of epidemiologic, clinical, and laboratory data link benzene to aplastic anaemia, acute leukaemia, and bone marrow abnormalities.

Benzene targets liver, kidney, lung, heart and the brain and can cause strand breaks of the DNA (Deoxyribonucleic acid), ultimately leading to chromosomal damage



Common Name: Benzene  
Molecular Formula:  $C_6H_6$   
Nature: Non-polar in water but readily miscible in organic solvents



**Figure No. 16: Annual Average trend of Benzene concentration recorded at Aurangabad, Bandra, Chandrapur and Civil lines, Chandrapur, CAAQMS**

The annual average standard for benzene has been set as 5µg/m<sup>3</sup> by CPCB. Out of 8 CAAQMS which recorded Benzene concentration, Dombivali CAAQMS recorded highest concentration of 14µg/m<sup>3</sup> in the month of October which is nearly 3 times the permissible limit. It recorded high concentration during the period of summer and winter season. Similar situation was observed at Nagpur CAAQMS where the concentration reached at 12µg/m<sup>3</sup> in December. Chandrapur CAAQMS recorded concentration which exceeded the standard Annual average during the month of April (6µg/m<sup>3</sup>), October (6µg/m<sup>3</sup>), November (10µg/m<sup>3</sup>) and December (6µg/m<sup>3</sup>). At Aurangabad CAAQMS, The concentration of Benzene reached the annual standard value of 5µg/m<sup>3</sup> during the months of February and December. Bandra, Civil lines Chandrapur and Pune CAAQMS were found to be relatively clean in case of Benzene pollution throughout the year of 2017-18.



## Air Quality Index

It is a tool based on numerical scale which can be used for depicting status of day to day air quality with respect to human health and the environment. AQI transforms complex air quality data of various pollutants into a single index value which makes it easy to understand. Extent of air pollution and its severity can be mapped by calculating AQI for the respective air pollutants. Increase in AQI indicates increased air pollution and increased chances of threats associated with pollutants to human health. Thus, it makes AQI an effective communication tool for addressing air quality status to people. The status of air quality is expressed as Good, Satisfactory, Moderate, Poor, Very Poor and Severe based on recorded concentrations of various pollutants and their health impacts at various concentrations Table No. 8. To make it easy to understand, color codes has been assigned for different categories. Various international environmental agencies such as US-EPA have developed their own set of mathematical algorithms to determine AQI, which are based on human exposure dose of air pollutants. CPCB in consultation with IIT (Indian Institute of Technology) Kanpur, devised an AQI system after conducting a literature review, understanding the air quality monitoring procedures and protocols, INAQs (Indian National Air Quality Standards), and dose-response relationships of pollutants.

**Table No. 8: Health advisories for various range of Air Quality Indices and respective colour codes**

AQI	AQI Associated Health Impacts
Good (0–50)	Minimal Impact.
Satisfactory (51–100)	Minor breathing discomfort to sensitive people.
Moderate (101–200)	Breathing discomfort to the people with lung disease such as asthma and discomfort to people with heart disease, children and older adults.
Poor (201–300)	Breathing discomfort to people on prolonged exposure and discomfort to people with heart disease.
Very Poor (301–400)	Respiratory illness to the people on prolonged exposure specially in people with lung and heart diseases.
Severe (401-500)	Respiratory effects even on healthy people and serious health impacts on people with lung/heart diseases. The health impacts may be experienced even during light physical activity.

## Calculation of AQI

AQI is calculated using the AQ subindex and the health breakpoints which are evolved for eight pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, NH<sub>3</sub>, and Pb) for which short-term (upto 24-hours) are prescribed by NAAQS. Based on the measured ambient concentrations of a pollutant, sub-index is calculated, which is a linear function of concentration (e.g. the sub-index for PM<sub>2.5</sub> will be 51 at concentration 31µg/m<sup>3</sup>, 100 at concentration 60µg/m<sup>3</sup>, and 75 at concentration of 45µg/m<sup>3</sup>). The worst sub-index determines the overall AQI. The sub-indices for individual pollutants at a monitoring location are calculated using its 24-hourly average concentration value (8-hourly in case of CO and O<sub>3</sub>) and health breakpoint concentration range (Table No. 9).

Overall AQI is calculated only if data are available for minimum three pollutants out of which one should necessarily be either PM<sub>2.5</sub> or PM<sub>10</sub>. Else, data are considered insufficient for calculating AQI. Similarly, a minimum of 16 hours' data is considered necessary for calculating sub index. The sub-indices for monitored pollutants are calculated and disseminated, even if data are inadequate for determining AQI. The Individual pollutant-wise sub-index will provide air quality status for that pollutant. The worst sub-index is the AQI for that location.

**Table No. 9: Sub-index and breakpoint pollutant concentration for Indian Air Quality Index**

AQI Category (Range)	PM10 24-hr	PM2.5 24-hr	NO2 24-hr	O3 8-hr	CO 8-hr (mg/m <sup>3</sup> )	SO2 24-hr	NH3 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5-1.0
Moderate (101-200)	101-250	61-90	81-180	101-168	2.1-10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430+	250+	400+	748+*	34+	1600+	1800+	3.5+

$$I = \frac{(I_{High} - I_{low})}{(C_{high} - C_{low})} * (C - C_{low}) + I_{low}$$

where:  $I$  = the (Air Quality) index  
 $C$  = the pollutant concentration  
 $C_{low}$  = the concentration breakpoint that is  $\leq C$   
 $C_{high}$  = the concentration breakpoint that is  $\geq C$   
 $I_{low}$  = the index breakpoint corresponding to  $C_{low}$   
 $I_{High}$  = the index breakpoint corresponding to  $C_{high}$

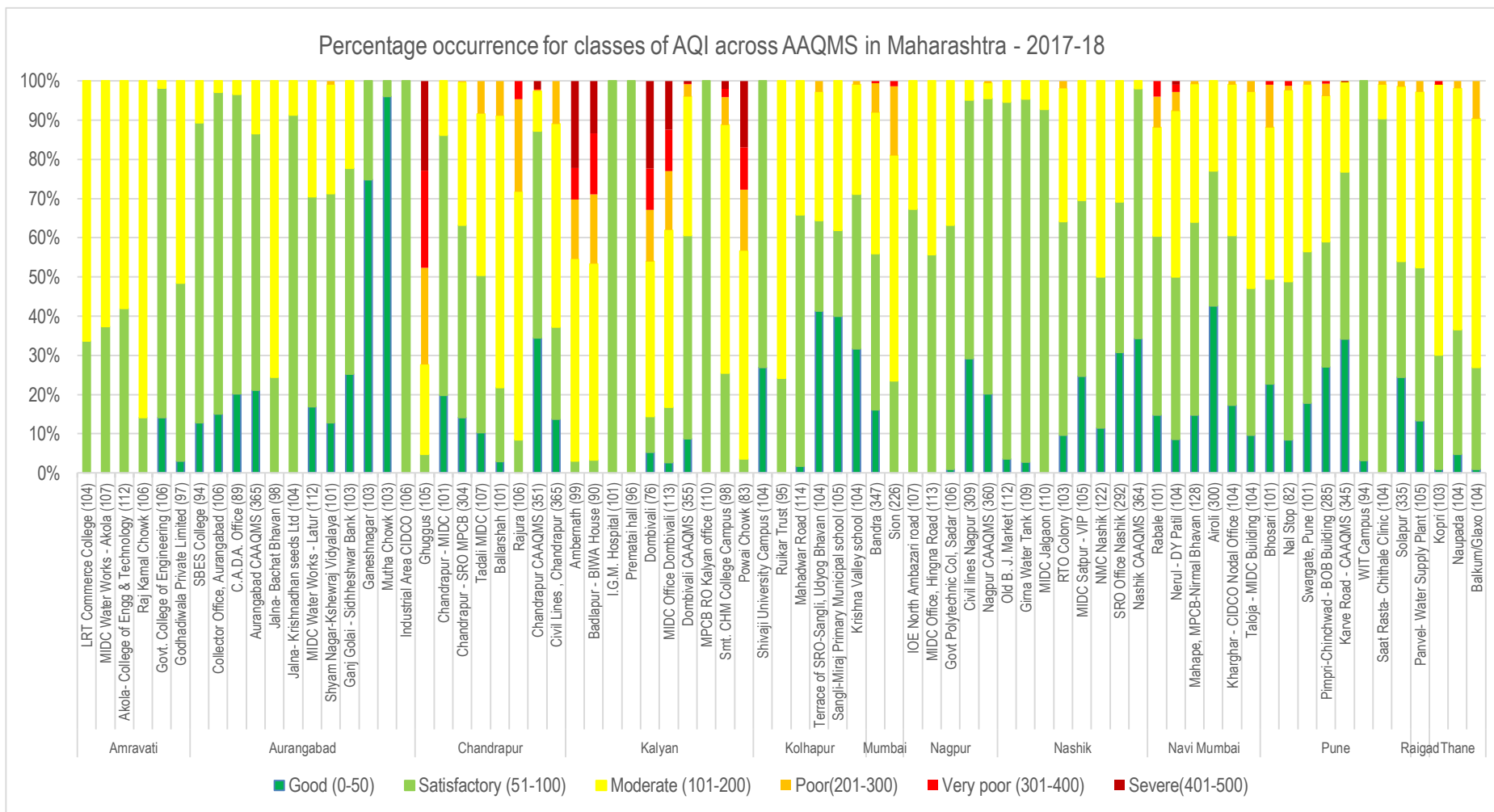
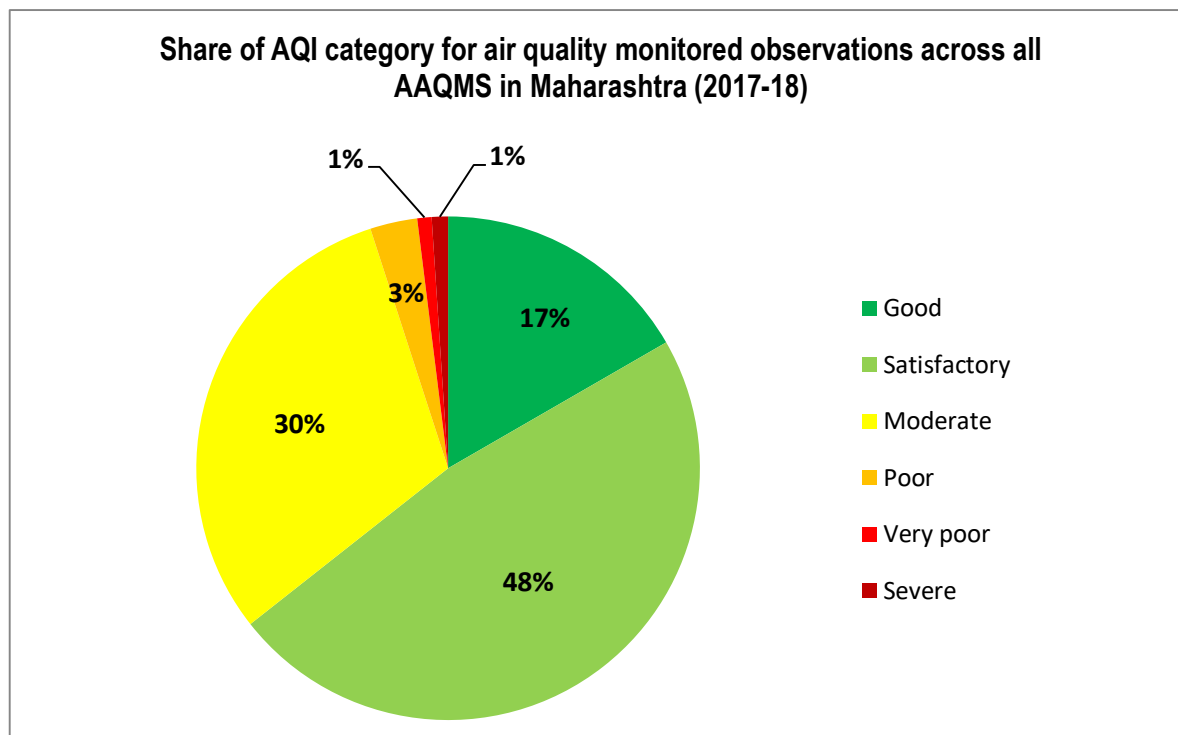


Figure No.17: Percentage occurrence for the classes of AQI across AAQMS in Maharashtra – 2017-18

An overview of the AQI for the reading recorded by the AAQMS in Maharashtra has been calculated using three parameters viz, SO<sub>2</sub>, NO<sub>x</sub> and RSPM as per the calculation and AQI categories released by CPCB and IIT Kanpur in October 2014. After determining the sub-indices for a region the highest sub-index from that AAQMS has been considered as the AQI for the area represented by that AAQMS. [Annex-3](#) presents the occurrence of a respective category of AQI out of the total observations recorded at that AAQMS in 2017-18.



**Figure No.18: Share of AQI category for air quality for monitored observations across all AAQMS in Maharashtra (2017-18)<sup>7</sup>**

In the year 2017-18, air quality was monitored across 75 active AAQMS in Maharashtra representing 25 cities. As shown in Figure No.18, it is interesting to note that around 7141 daily observations were in ‘Good’ and ‘Satisfactory’ category which accounted for more than 65% of total observations. Thus recording an improvement of non-polluted days by almost 5% than previous year (60%) in 2016-17. Similarly, the share of Moderate recorded decrease of almost 5% from 35% to 30% in 2017-18. The decreasing trend was observed in ‘Poor’ category from 4% in 2016-17 to 3% in 2017-18. Less than 2% of the observations days were categorised as ‘Very Poor’ and ‘Severe’.

In the Amravati region, observations recorded at all locations were found to be within the category from ‘Good’ to ‘Satisfactory’ and ‘Moderate’. More than 98% of the observations recorded at AAQMS at Govt. College of Engineering in Amravati city were found to in ‘Good’ and ‘Satisfactory’ category while only about 2% were found to be in ‘Moderate’ category, while Godhadiwala Private Limited AAQMS recorded nearly 49% observations in ‘Good and Satisfactory’ with around 51% in ‘Moderate category Majority of the Kamal Chowk AAQMS observations were found to be in Moderate category (85%) with only around 15% of the observations were found to be in ‘Satisfactory’ category.

<sup>7</sup>Note: Since the values have been rounded up, some values may appear as zero.



In Aurangabad city, all 4 AAQMS namely, SBES college, Collector office, C.A.D.A. office and Aurangabad CAAQMS recorded more than 85% of the total observations having 'Good' and 'Satisfactory' category of air quality. Similar pattern was observed in Krishnandan seeds ltd site in Jalna having more than 90% of the total observations under 'Satisfactory' category. Only AAQMS located at Bachat Bhavan, Jalna representing residential area recorded less than 25% of observations under Satisfactory and majorly reported AQI in 'Moderate' category.

Latur city registered more than 70% of the observation days as non-polluted compared to 80% in 2016-17. Both Ganesh Nagar and Mutha Chowk recorded similar number of observations (103), all of which came under 'Good' and 'Satisfactory' range giving 100% non-polluted days.

In Chandrapur Area, 2 out of 7 AAQMS - Chandrapur MIDC and Chandrapur CAAQMS reported more than 80% of the observations from 'Good' to 'Satisfactory' category. Major concern in Chandrapur area is Ghuggus site where around 48% of the observations were recorded in 'Very Poor' and 'Severe' category with only around 5% of the observations were reported as non-polluted. Rajura AAQMS recorded around 24% of the observations in 'Poor' category. Majority of the days around this site had an AQI of 'Moderate' air quality (63%).

In the Kalyan region, Ambernath, Badlapur, Dombivali and Ulhasnagar areas recorded more than 70% of the observation days in 'Moderate', 'Poor' and 'Very Poor' category .with Ambernath (96.9%) ranking highest followed by Badlapur-BIWA house (96.6%) and Powai Chowk (96.4%). MPCB RO Kalyan Office recorded 100% observations having 'Satisfactory' air quality whereas Dombivali CAAQMS site recorded more than 60% of the total observation days as "Good' and 'Satisfactory'.

In Kolhapur, out of 6 AAQMS locations, only 1 AAQMS located at Shivaji University, recorded all the observation days in 'Good' and 'Satisfactory' categories .Except for Ruikar Trust AAQMS, remaining 4 AAQMS recorded more than 60% of the observation days in 'Good' and 'Satisfactory' range. Ruikar Trust AAQMS recorded higher percent of observation days in 'Moderate' category which accounted for more than 75% of the total observation days. Compared to previous year's observation (70%), Sangli town of Kolhapur RO recorded a drop of almost 8% in 'Good' and 'Satisfactory' range days to around 62% in 2017-18.

In the Nagpur and Nashik regions, the AQI recorded was majoritily in the 'Good' and 'Satisfactory' category and all the stations recorded more than 50% of the observation days in either of these categories. Nagpur CAAQMS and Civil lines Nagpur showed highest percentage of non-polluted days with 95.5% and 95.1% of the observations respectively falling in Good to Satisfactory category of air quality while as far as Nashik region is concerned, 4 locations namely Old B.J.Market, Girna Water Tank, MIDC Jalgaon and Nashik CAAQMS recorded more than 90% of the observation days as non-polluted days.

Majority of the observation days at Bandra AAQMS were recorded within non-polluted days (56%). Around 36% and 58% of the observations of Bandra and Sion AAQMS respectively were observed under 'Moderate' category whereas observations under 'Poor' category had a share of around 7.5% and 17.7% in Bandra and Sion site respectively. As against this, neighbouring Navi Mumbai recorded AQI in 'Good and 'Satisfactory' in the range of 40% to 60% of the observation days across all the AAQMS. Compared to 95% in 2016-17, more than 77% of the observations from the Airoli AAQMS of Navi Mumbai region registered under the 'Good' and 'Satisfactory' category.



Cities of Pune, Pimpri-Chinchwad and Solapur comes under Pune Regional office. There are 8 AAQMS installed in these cities. Out of 5 AAQMS installed in Pune, 3 sites namely Bhosari and Nal stop recorded less than 50% of non-polluted days while Pimpri-Chinchwad BOB building and Karve road CAAQMS recorded around 59% and 77% non-polluted days respectively. 'Moderate' category air quality was observed at Nal stop (48.8%) and Swargate (42.6) whereas Bhosari recorded more than 10% of days in 'Poor' category, which is highest among stations in Pune region. All 86 observation days of WIT campus AAQMS in Solapur showed 100% observation days as non-polluted days followed by Saat rasta AAQMS with 90% non-polluted days. Solapur CAAQMS recorded only 54% as non-polluted days with 44.5% as 'Moderate' and 1.5% in 'Poor' category.

Water Supply plant AAQMS at Panvel recorded 52.4% of observation days as Non-polluted days with 44.8% of observation in 'Moderate' category.

All 3 AAQMS in Thane namely, Kopri, Naupada and Balkum/Glaxo, reported more than 60% of observations under in 'Moderate' category.

## Conclusion

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Air pollution is a modern day curse, a by-product of heavy industrialization and urbanization. In the quest of developing our economy, we are deteriorating the quality of the very air we breathe. Today, ambient air pollution is one of the top risk factors causing millions of deaths worldwide while harming our environment. It is thus, necessary to continuously monitor air quality and take decisive preventive measures that can lead to sustainable development.

MPCB continuously monitors air quality through the installed network of AAQMS across Maharashtra. In the year 2017-18, RSPM was found to be a point of concern in a majority of areas in Maharashtra as only 3 AAQMS out of 75, namely Ganeshnagar, Mutha chowk (Aurangabad) and Shivaji University Campus (Kolhapur) recorded levels lower than the annual prescribed standards set by CPCB in 2009. Airoli (Navi Mumbai) recorded levels of  $61 \mu\text{g}/\text{m}^3$  which is near to a set standard value while in neighbouring Mumbai region, both Bandra and Sion AAQMS recorded slight improvement in RSPM concentrations as compared to previous year. RSPM pollution is a point of concern because these particles are capable of penetrating deep into the lungs during respiration and can enter the bloodstream. It can cause several cardiovascular and respiratory illnesses which can sometimes prove fatal to a human being. The high concentration is attributed to high levels of emissions from industries, quarrying and mining activities in the region. Appropriate operation and maintenance practices at mines and quarry sites like use of water mists, wind screens, low dump sites, Construction of even and smooth roads, appropriate sweeping of roads and strict norms for the construction sector should be regulated to minimize the dispersion of RSPM into the air.

The NO<sub>x</sub> concentration was observed to have exceeded at around 29 out of the 75 AAQMS, primarily in the areas of Kalyan, Mumbai, Dombivali, Pune and Thane. Anthropogenic activities like direct and indirect agricultural emissions and industrial emissions like combustion of fossil fuels and biomass leads to NO<sub>x</sub> emissions. High concentrations affect human health and also affect the environment by playing a major role in the processes of acidification and eutrophication. Sustainable climate smart agricultural practices and promotion and use of renewable energy alternatives are required to curb NO<sub>x</sub> pollution.

The state of Maharashtra was found to be relatively clean for SO<sub>2</sub> pollution. All AAQMS recorded SO<sub>2</sub> concentrations well within daily as well as annual standards. The AAQMS at Industrial area, CIDCO recorded highest SO<sub>2</sub> concentration of  $47 \mu\text{g}/\text{m}^3$  which is under the prescribed annual standard value of  $50 \mu\text{g}/\text{m}^3$ . It is worth noting that compared to previous year, the station recorded less concentration of SO<sub>2</sub> from  $78 \mu\text{g}/\text{m}^3$  in 2016-17 to  $47 \mu\text{g}/\text{m}^3$  in 2017-18. The cities of Nagpur, Nashik, Amravati, Aurangabad and Chandrapur recorded annual SO<sub>2</sub> concentrations less than  $20 \mu\text{g}/\text{m}^3$  and were relatively clean with respect to SO<sub>2</sub> pollution.

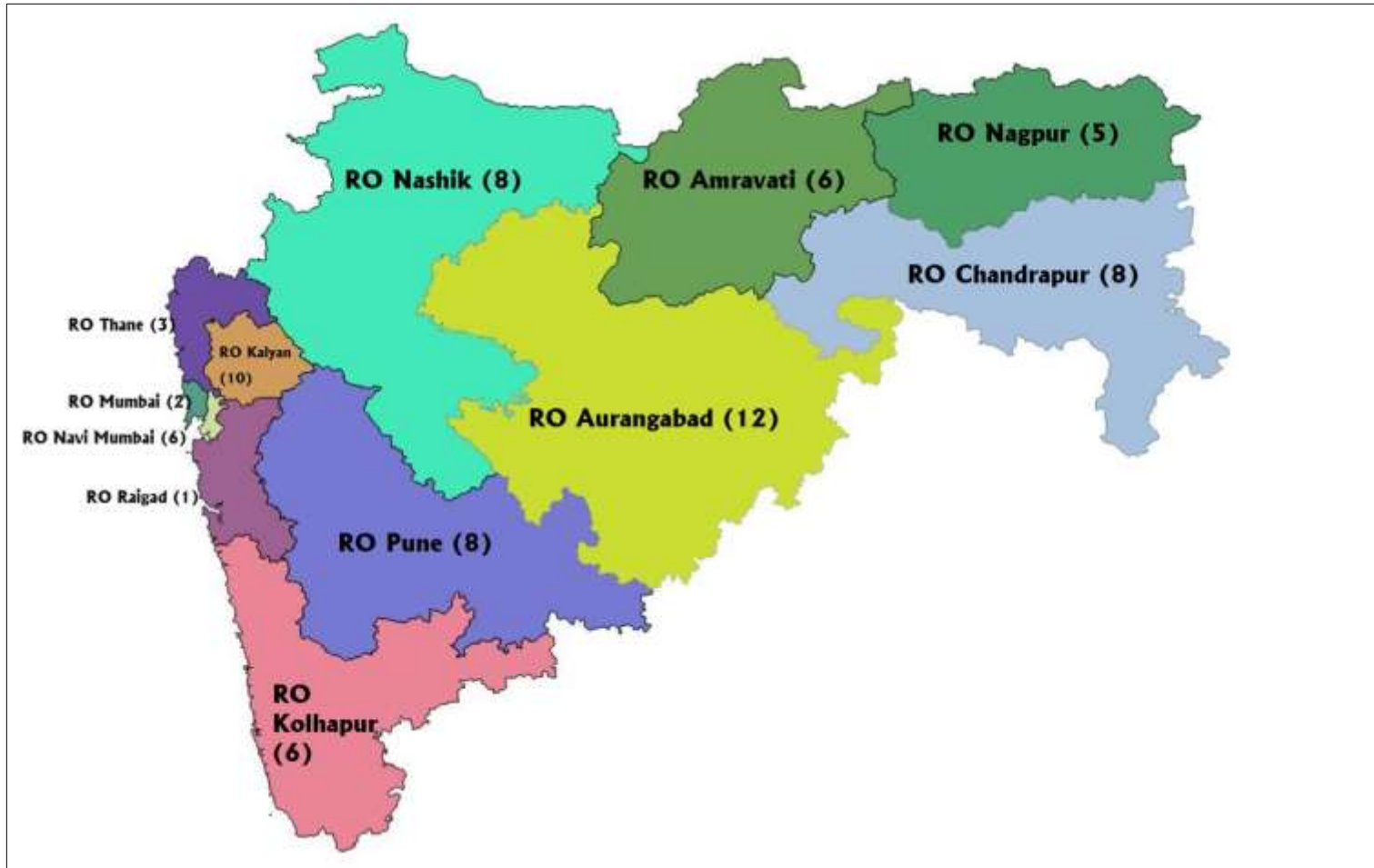
Breathing high concentrations of CO leads to reduced ability of oxygen transport by haemoglobin in the body and may lead to other health issues like headache, high chances of chest pain. In 2017-18, Solapur recorded higher CO concentrations, where 8 hourly concentrations crossed standard levels ( $2 \text{ mg}/\text{m}^3$ ) in 7 out of the 12 months observed, followed by the cities of Bandra, Dombivali, Nagpur and Pune which recorded high concentration during a particular period of time. Main source of CO is vehicular emission therefore particularly these regions must take preventive steps like traffic management and periodic emission exhaust testing of vehicles. Public participation in reducing the impact

due to increased pollution loads is very much necessary and can participate in Government clean air mission by regularly servicing of their vehicles, not burning fossil fuels on open spaces, investigating carpooling options etc.

In terms of ozone pollution, the cities of Nashik, Solapur and Aurangabad need to implement strategies to reduce the ozone pollution.

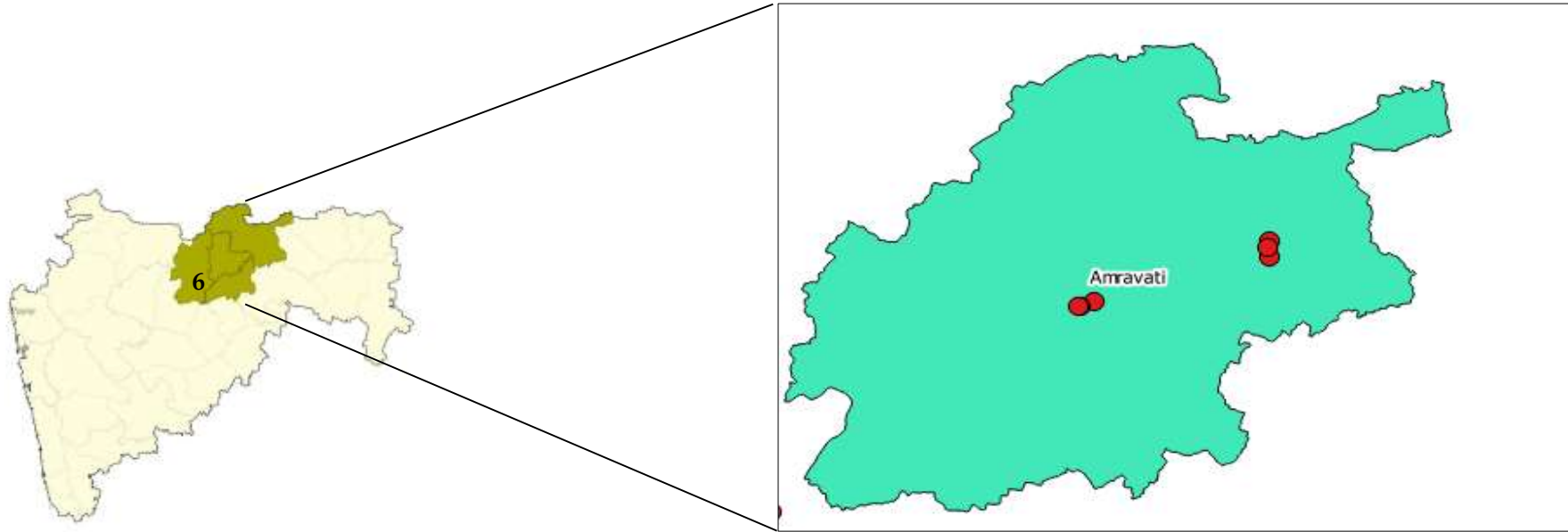
Benzene concentration was found to be high especially during summer and winter season. Dombivali CAAQMS recorded highest concentration of  $14\mu\text{g}/\text{m}^3$  in the month of October which is nearly 3 times the permissible limit. Similar trend was observed at Nagpur and Chandrapur CAAQMS whereas Bandra, Civil lines Chandrapur and Pune CAAQMS were found to be relatively clean in case of Benzene pollution throughout the year of 2017-18.

## Data recorded by AAQMS across Maharashtra 2017-18





## RO – Amravati



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Amravati	Akola	700	LRT Commerce College	Residential	20° 41' 01.2" N	77° 02' 43.5" E
	Akola	701	MIDC Water Works - Akola	Industrial	20° 41' 12.1" N	77° 02' 20.1" E
	Akola	702	Akola- College of Engg & Technology	Commercial	20° 42' 16.6" N	77° 05' 35.9" E
	Amravati	547	Raj Kamal Chowk	Rural and other areas	20° 55' 42.4" N	77° 45' 14.2" E
	Amravati	548	Govt. College of Engineering	Residential	20° 57' 14.8" N	77° 45' 35.3" E
	Amravati	549	Godhadiwala Private Limited	Industrial	20° 53' 20.9" N	77° 45' 32.0" E

## Akola – LRT Commerce College

Table No. 10: Data for Monthly average reading recorded at LRT Commerce College. - Akola

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
LRT Commerce College	2017	Apr	10	10	130
		May	10	10	127
		Jun	8	10	123
		Jul	7	10	120
		Aug	7	9	129
		Sep	7	10	122
		Oct	8	10	132
		Nov	12	12	121
		Dec	10	10	77
	2018	Jan	10	10	70
		Feb	10	11	67
		Mar	10	11	66

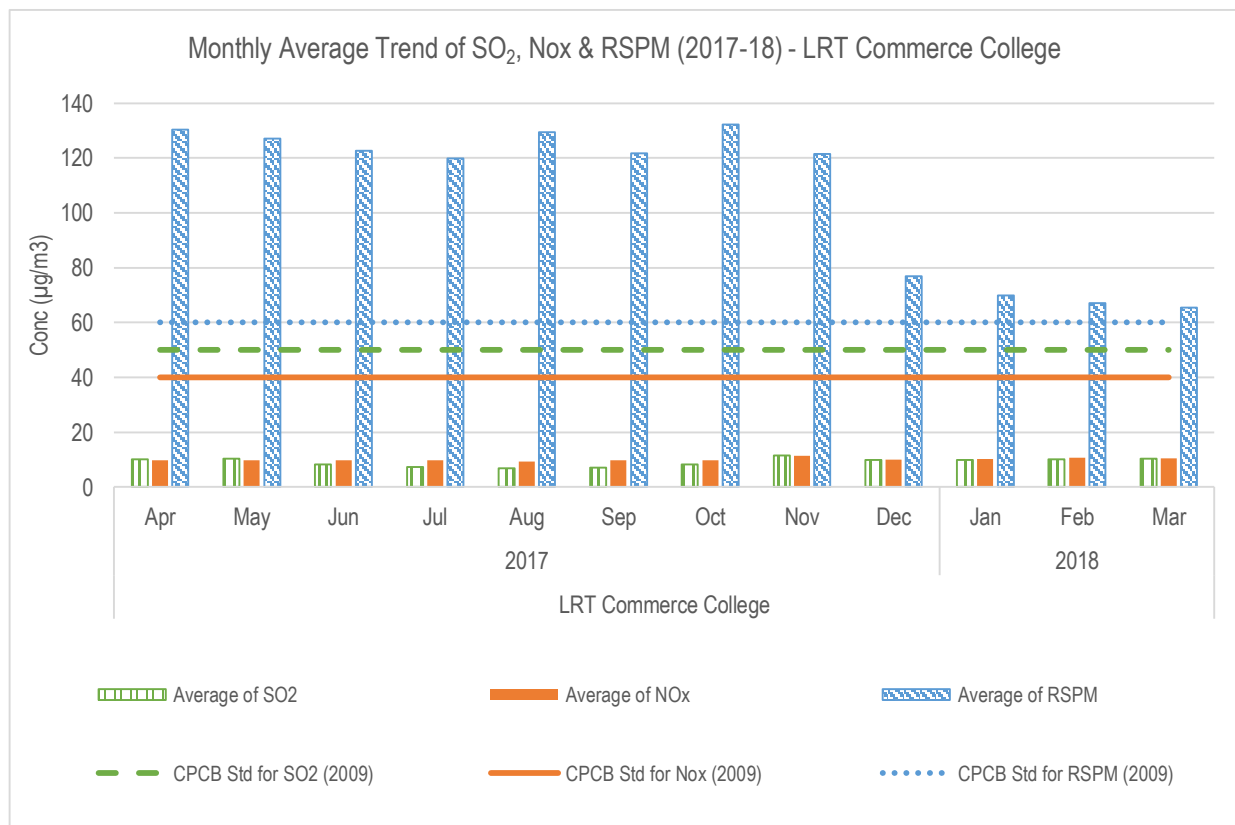


Figure No. 19: Monthly average reading recorded at LRT Commerce College. – Akola

Table No. 11: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at LRT Commerce College. – Akola

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
LRT Commerce College	09-10	6	2	87
	10-11	6	3	107
	11-12	7	7	125
	12-13	8	8	126
	13-14	7	3	122
	14-15	7	3	117
	15-16	7	7	115
	16-17	8	9	109
	17-18	9	10	107

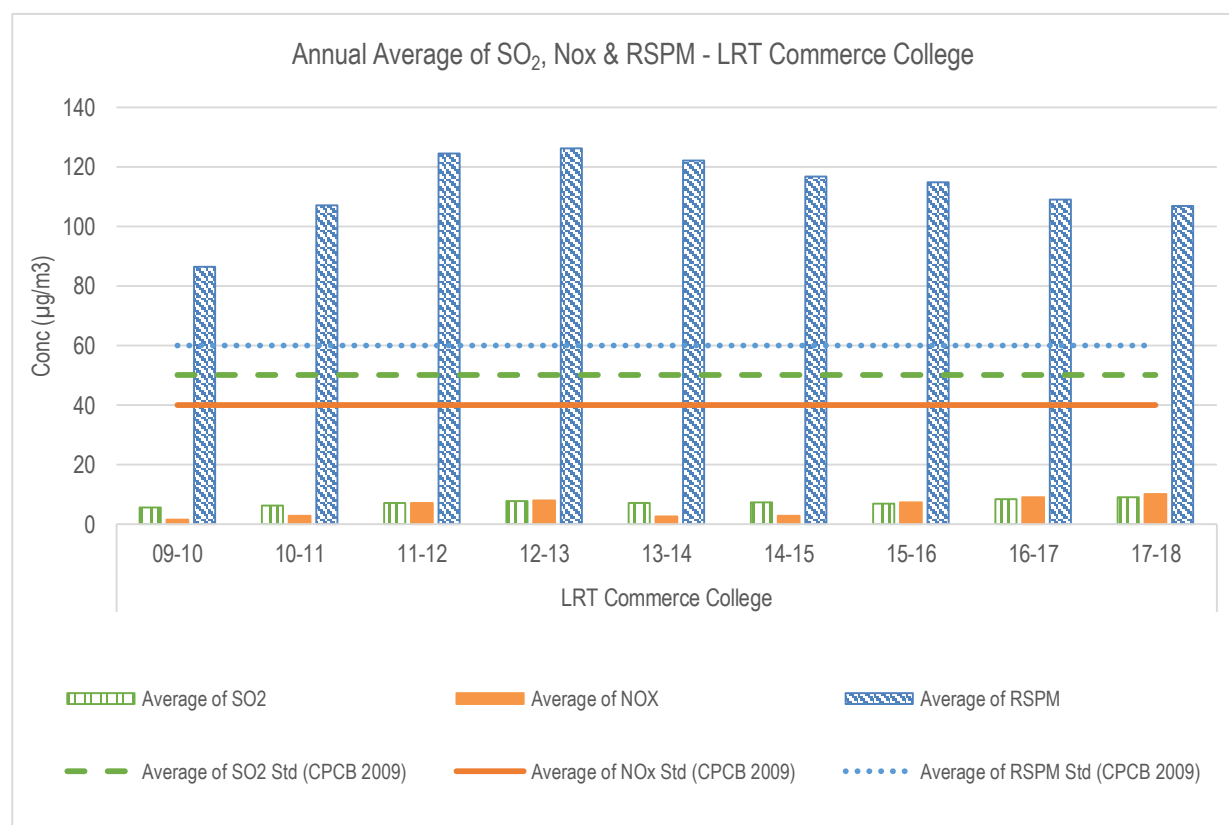


Figure No. 20: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at LRT Commerce College. – Akola



## Akola -MIDC Water Works

Table No. 12: Data for Monthly average reading recorded at MIDC Water works.-Akola

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM	
			50	40	60	
MIDC Water Works - Akola	2017	Apr	10	11	139	
		May	12	12	141	
		Jun	10	11	133	
		Jul	9	10	119	
		Aug	10	10	128	
		Sep	9	10	131	
		Oct	10	11	138	
		Nov	10	10	110	
		Dec	12	12	90	
		2018	Jan	12	12	89
			Feb	12	12	87
			Mar	12	13	82

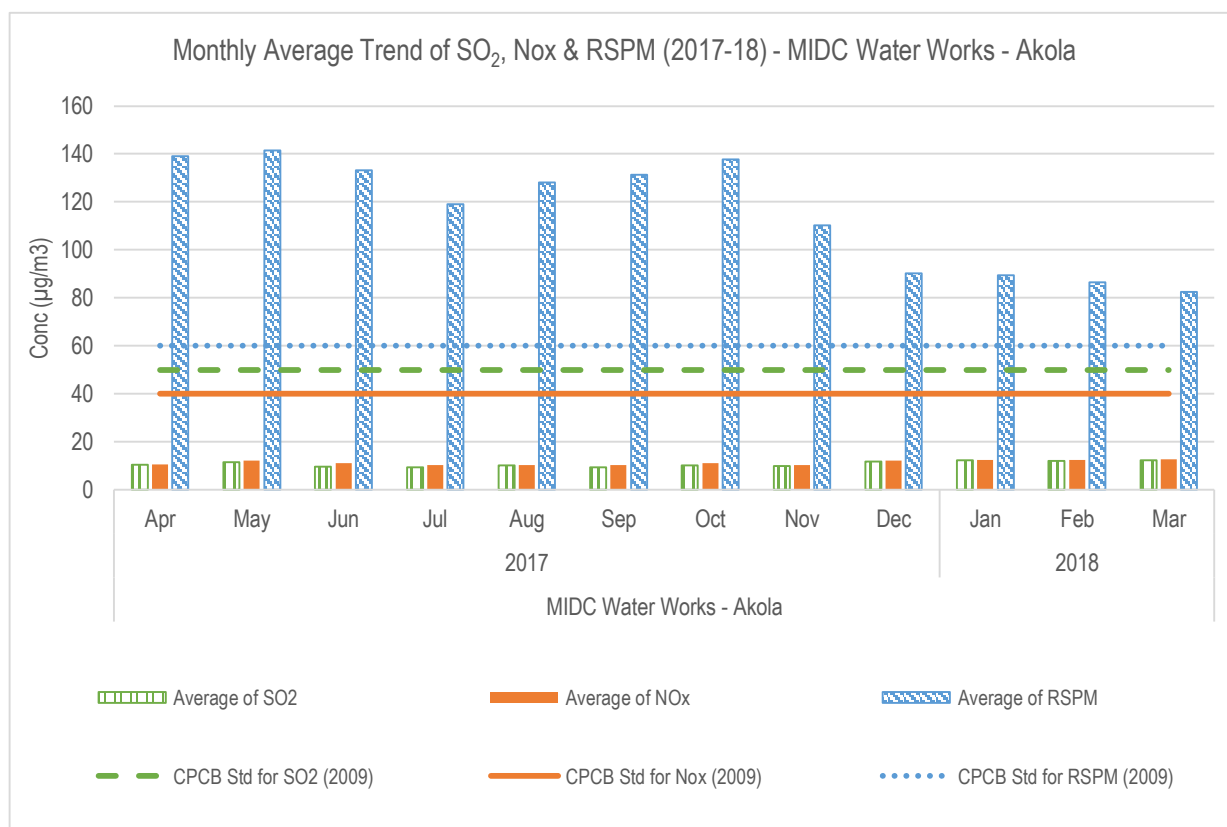


Figure No. 21: Monthly average reading recorded at MIDC Water works.-Akola

Table No. 13: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Water works.-Akola

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
MIDC Water Works - Akola	09-10	8	10	88
	10-11	9	7	131
	11-12	10	11	141
	12-13	10	11	142
	13-14	9	7	136
	14-15	9	9	129
	15-16	7	12	106
	16-17	9	10	128
	17-18	11	11	116

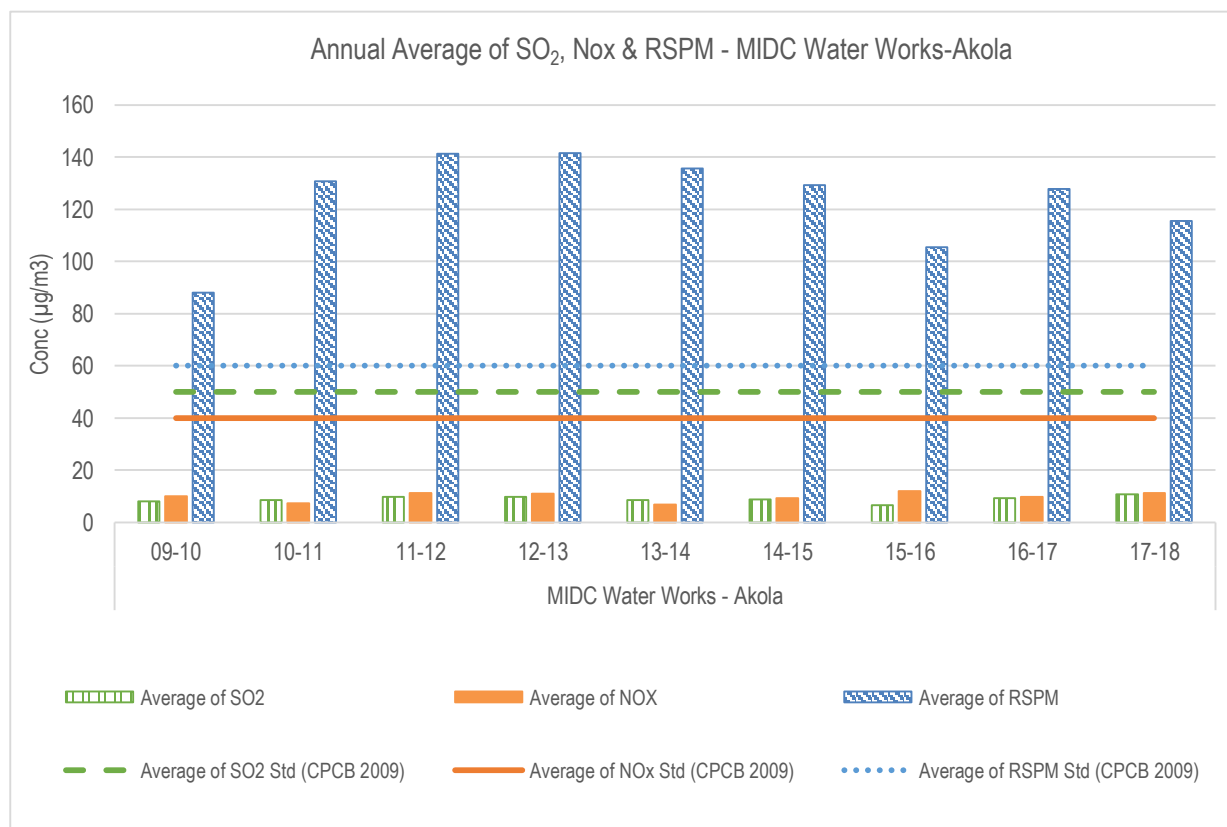


Figure No. 22: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Water works.-Akola

## Akola - College of Engg & Technology

Table No. 14: Data for Monthly average reading recorded at College of Engg & Technology Akola (Architecture Branch)-Akola

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Akola- College of Engg & Technology	2017	Apr	10	10	145
		May	9	10	145
		Jun	9	10	137
		Jul	7	9	124
		Aug	8	10	139
		Sep	9	10	138
		Oct	9	10	136
		Nov	10	10	95
		Dec	10	10	74
	2018	Jan	10	11	79
		Feb	11	11	73
		Mar	11	11	71

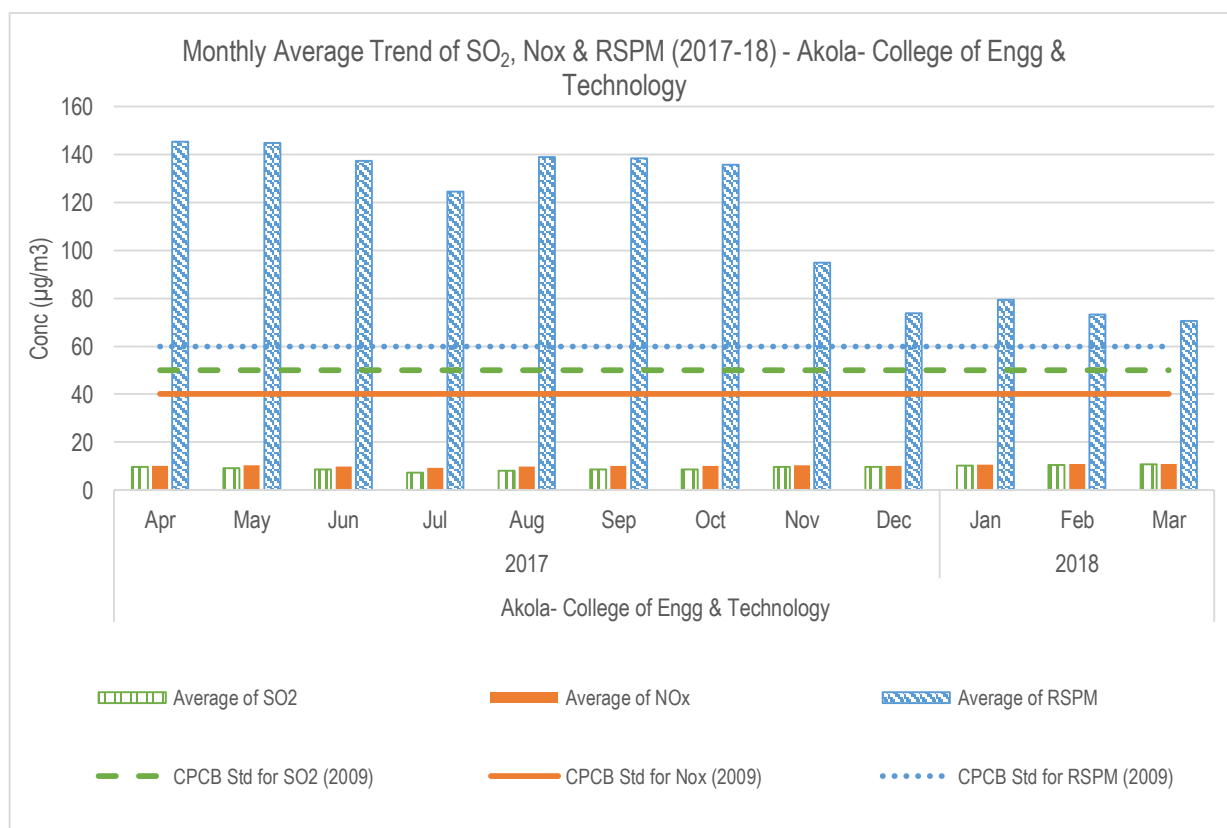
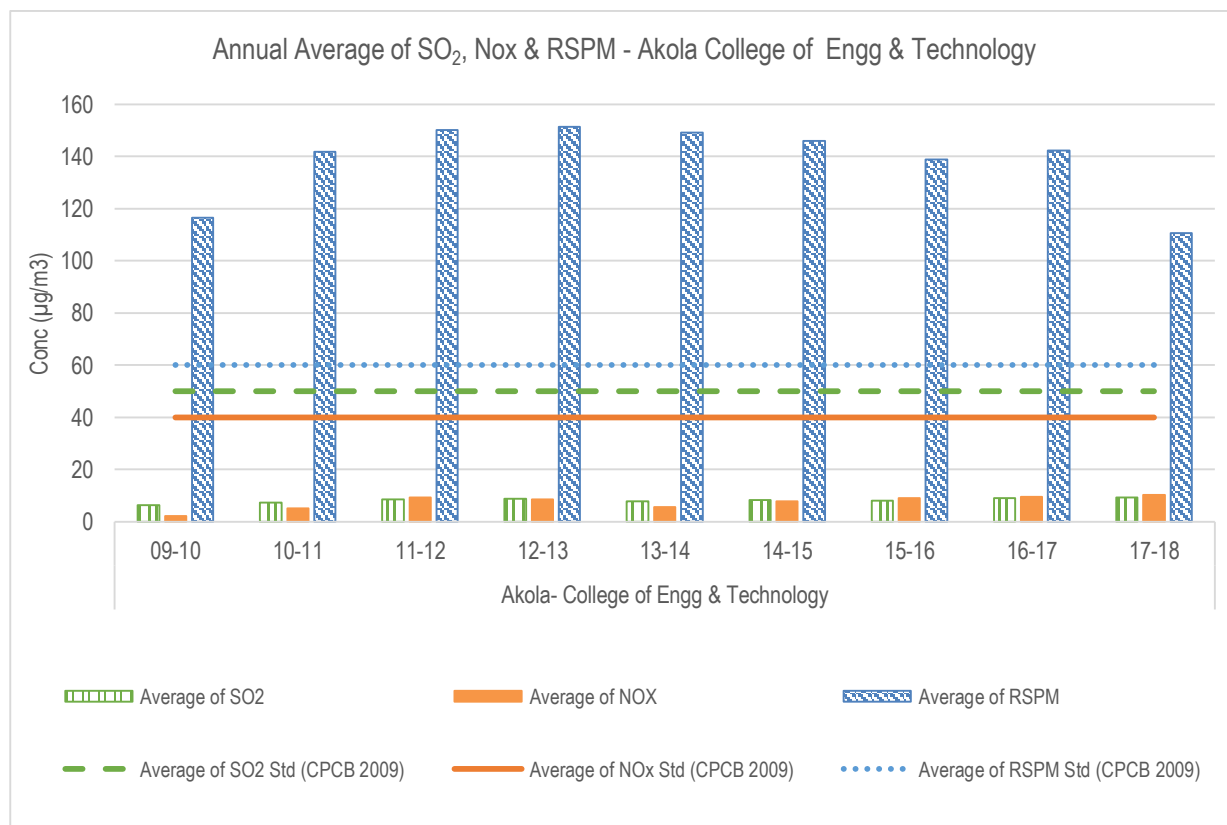


Figure No. 23: Monthly average reading recorded at College of Engg & Technology Akola (Architecture Branch)-Akola

**Table No. 15: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at College of Engg & Technology Akola (Architecture Branch)-Akola**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Akola- College of Engg & Technology	09-10	6	2	117
	10-11	7	5	142
	11-12	9	9	150
	12-13	9	8	151
	13-14	8	6	149
	14-15	8	8	146
	15-16	8	9	139
	16-17	9	9	142
	17-18	9	10	111



**Figure No. 24: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at College of Engg & Technology Akola (Architecture Branch)-Akola**

## Amravati - Raj Kamal Chowk

Table No. 16: Data for Monthly average reading recorded at Raj Kamal Chowk. -Amravati

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Raj Kamal Chowk	2017	Apr	15	16	147
		May	13	14	138
		Jun	13	15	119
		Jul	10	16	110
		Aug	11	14	108
		Sep	13	14	119
		Oct	12	13	122
		Nov	12	13	107
		Dec	14	15	115
	2018	Jan	14	15	121
		Feb	13	14	116
		Mar	13	117	122

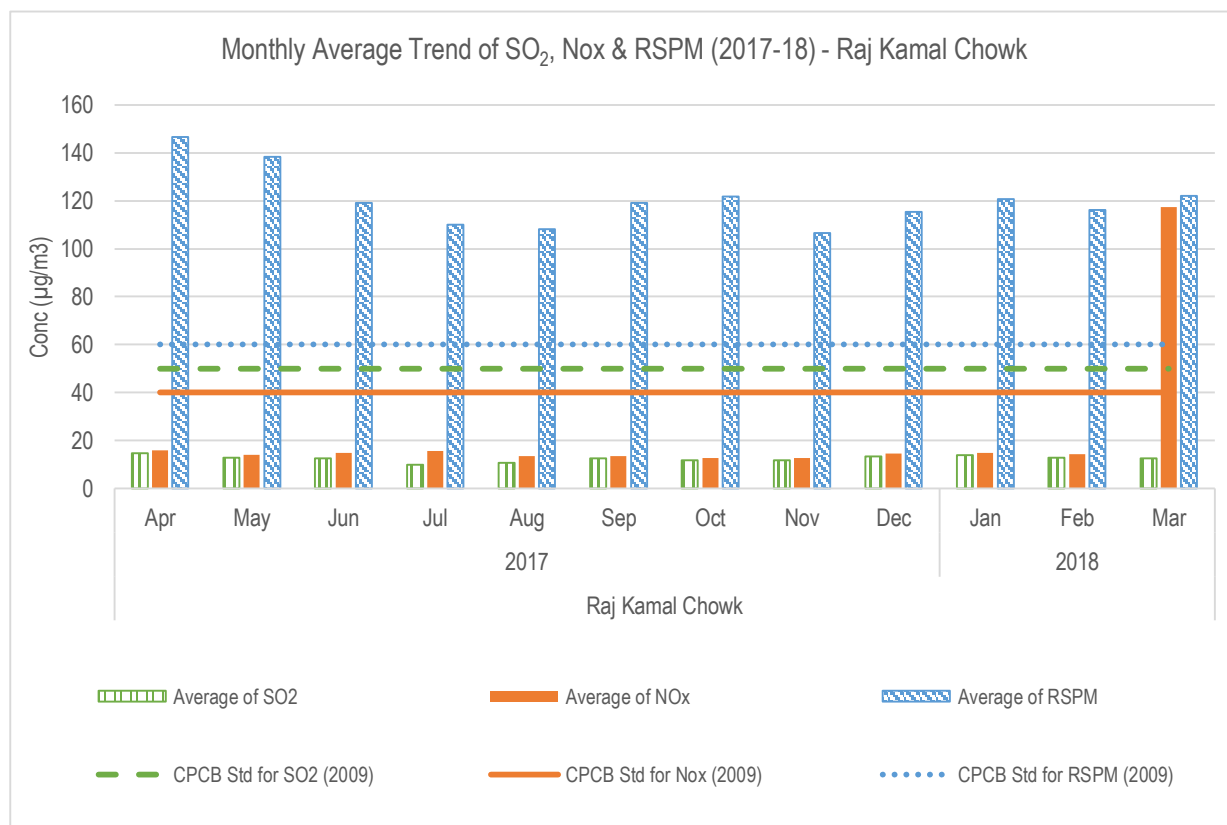


Figure No. 25: Monthly average reading recorded at Raj Kamal Chowk. -Amravati

Table No. 17: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Raj Kamal Chowk. - Amravati

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Raj Kamal Chowk	06-07	13	19	79
	07-08	11	16	78
	08-09	12	15	100
	09-10	14	16	125
	10-11	13	15	146
	11-12	15	18	108
	12-13	12	13	109
	13-14	12	13	128
	14-15	12	14	133
	15-16	12	14	135
	16-17	13	14	141
	17-18	13	23	120

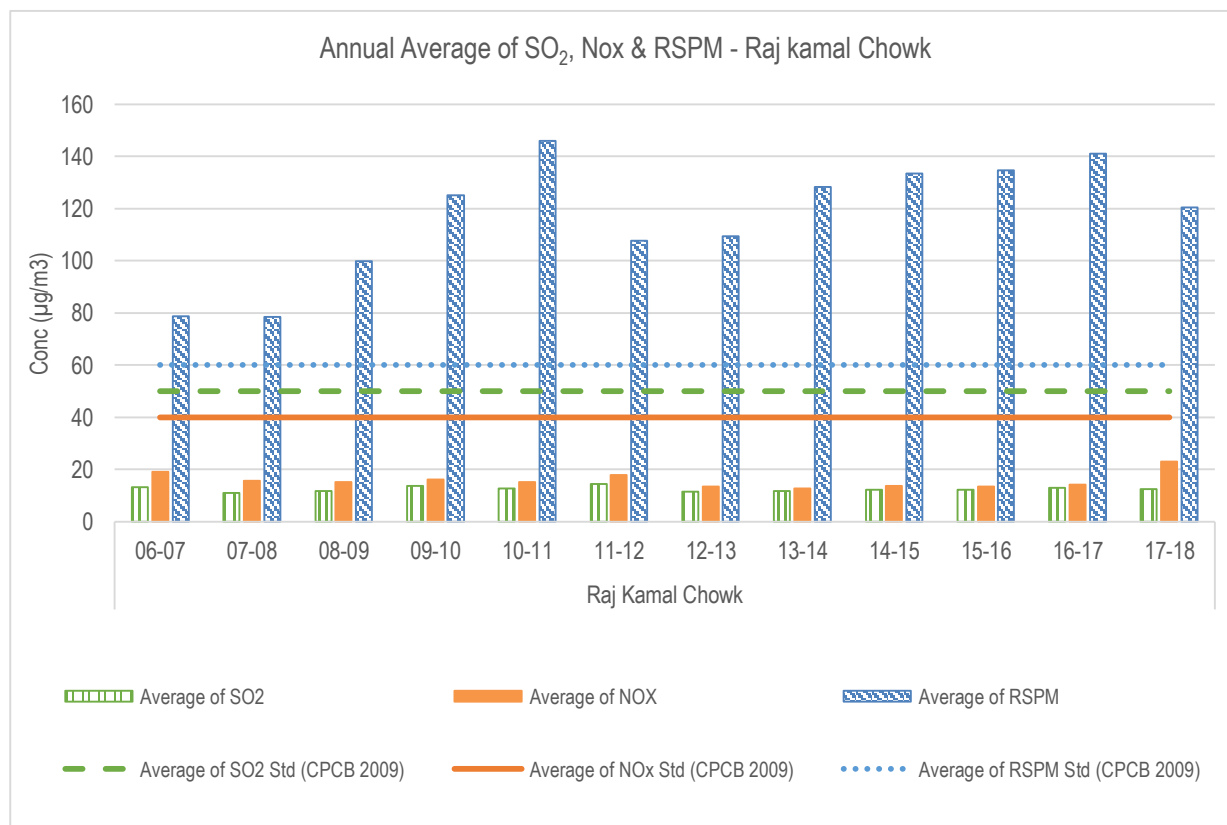


Figure No. 26: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Raj Kamal Chowk. -Amravati

### Amravati - Govt. college of Engineering

Table No. 18: Data for Monthly average reading recorded at Govt. college of Engineering - Amravati

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Govt. College of Engineering	2017	Apr	13	15	79
		May	13	14	82
		Jun	10	11	62
		Jul	9	10	52
		Aug	9	14	65
		Sep	11	12	64
		Oct	11	14	75
		Nov	12	13	70
		Dec	12	13	71
	2018	Jan	12	13	75
		Feb	11	13	70
		Mar	12	61	73

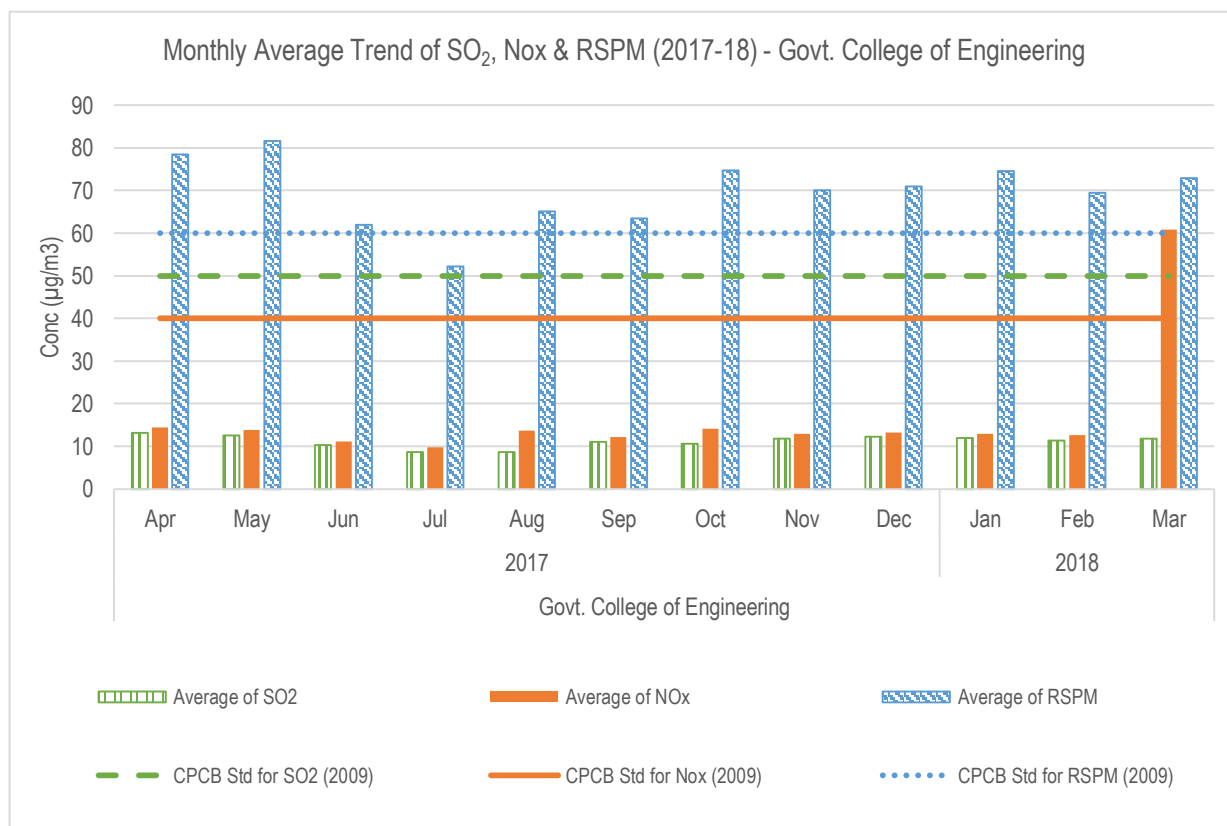


Figure No. 27: Monthly average reading recorded at Govt. college of Engineering - Amravati

Table No. 19: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Govt. college of Engineering - Amravati

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Govt. College of Engineering	06-07	10	12	50
	07-08	8	8	40
	08-09	8	10	47
	09-10	10	12	78
	10-11	10	13	79
	11-12	10	12	79
	12-13	11	12	80
	13-14	10	12	80
	14-15	11	12	75
	15-16	11	12	73
	16-17	11	13	73
	17-18	11	16	69

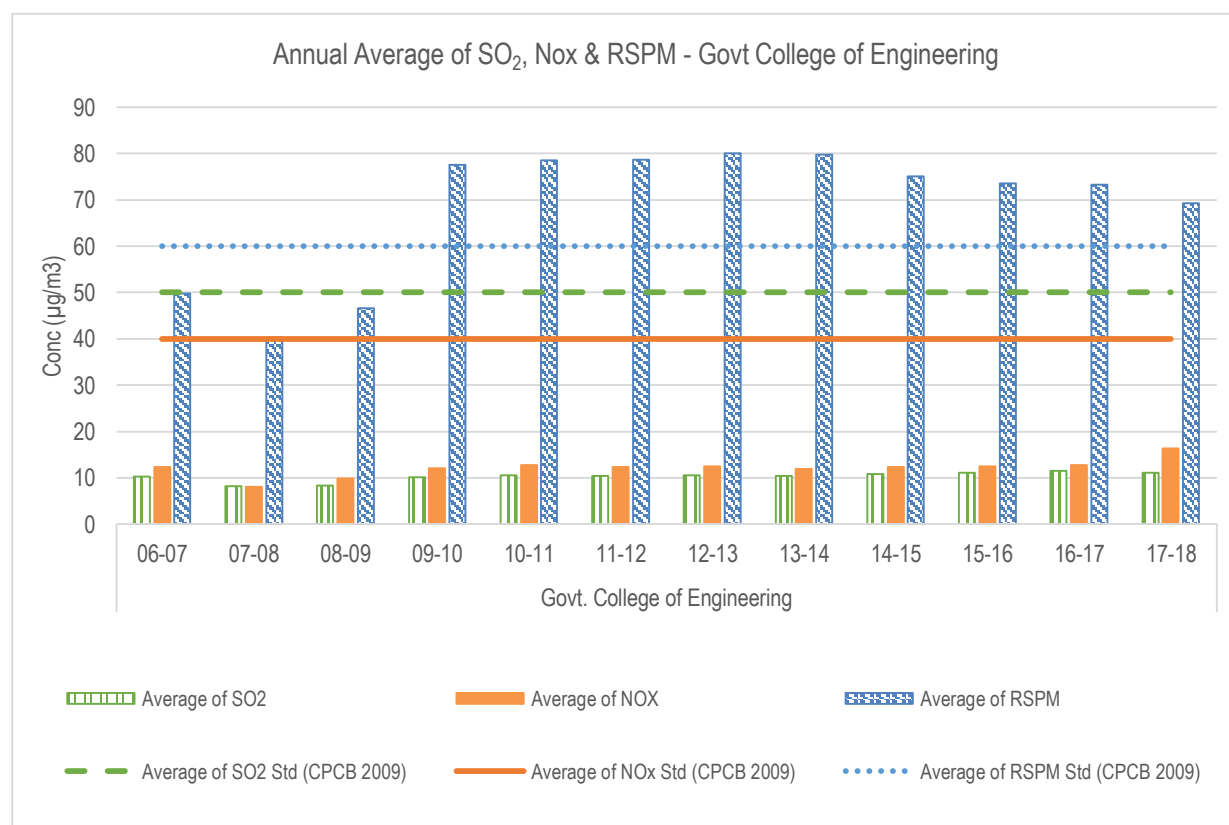


Figure No. 28: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Govt. college of Engineering - Amravati



## Amravati - Godhadiwala Private Limited

Table No. 20: Data for Monthly average reading recorded at Godhadiwala Private Limited - Amravati

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Godhadiwala Private Limited	2017	Apr	12	13	120
		May	11	12	105
		Jun	9	11	85
		Jul	10	11	82
		Aug	10	14	87
		Sep	10	11	98
		Oct	11	12	103
		Nov	12	13	105
		Dec	12	13	100
	2018	Jan	13	14	101
		Feb	12	13	89
		Mar	12	100	101

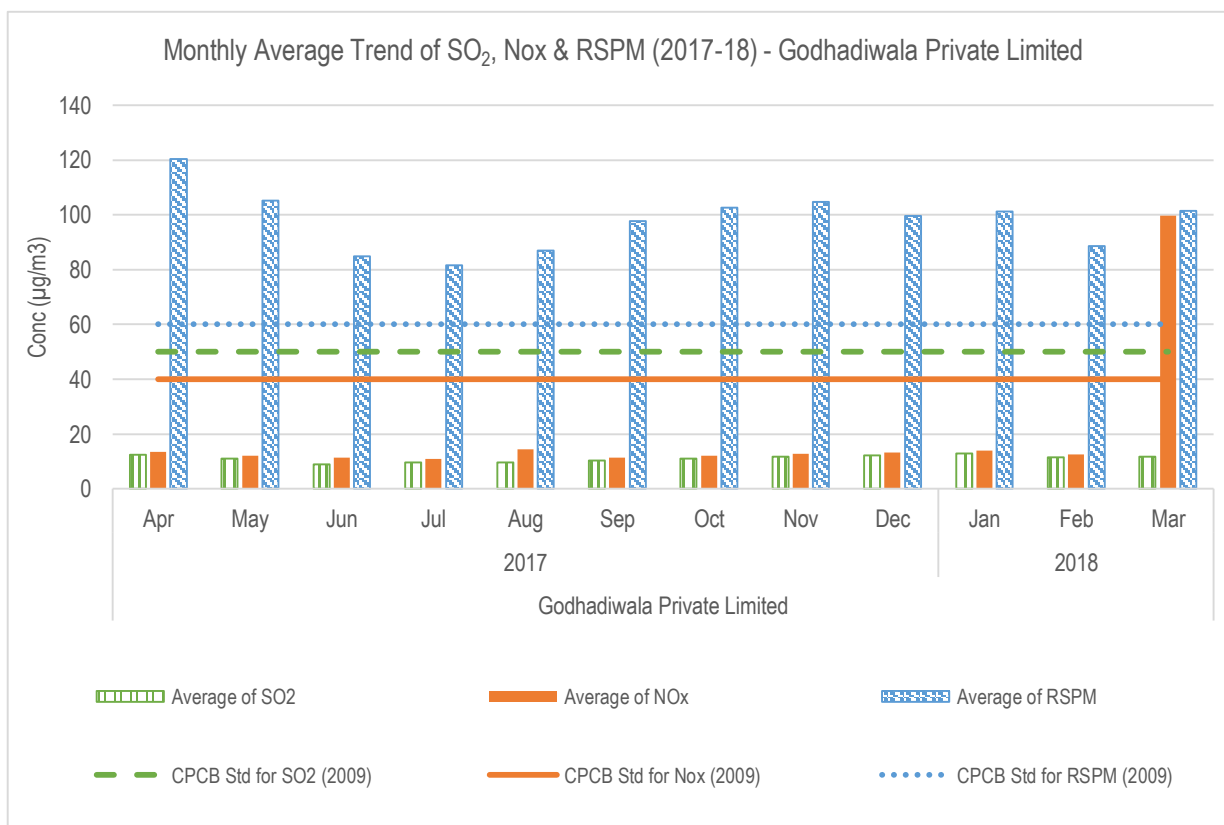
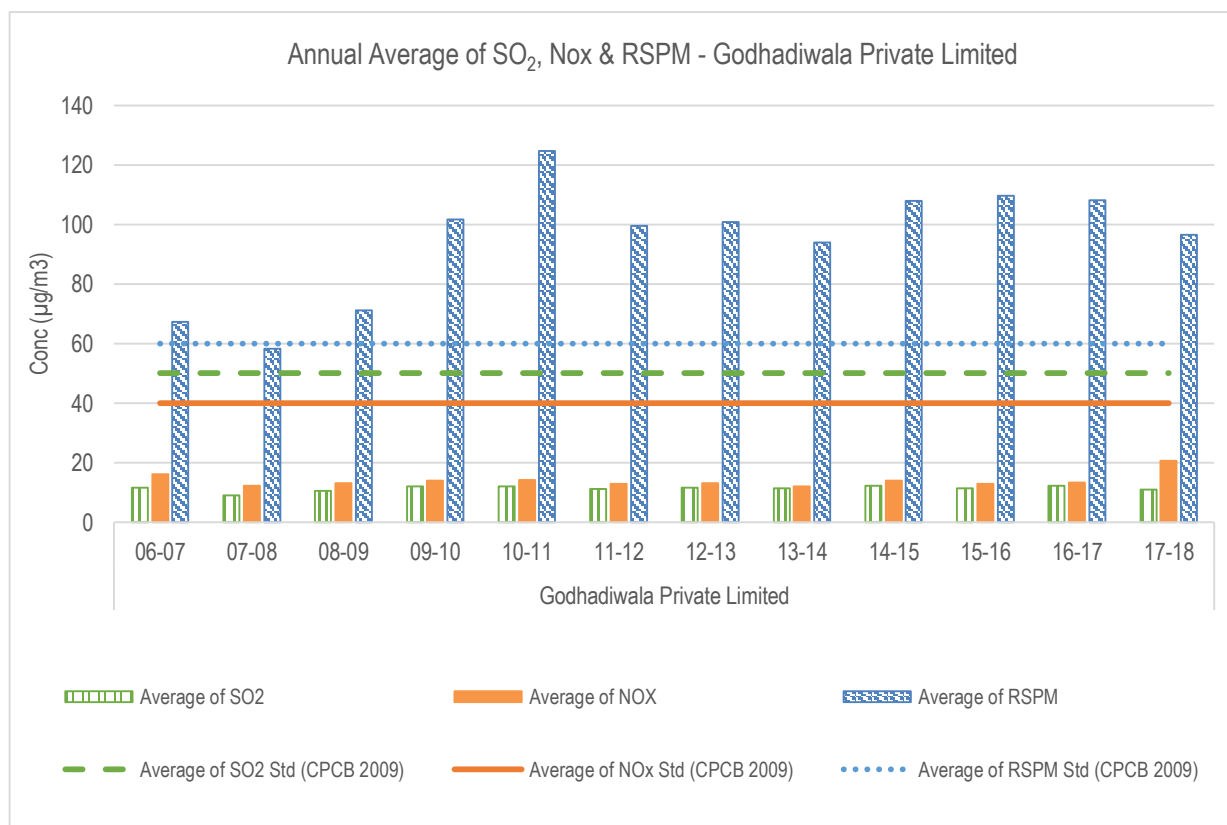


Figure No. 29: Monthly average reading recorded at Godhadiwala Private Limited - Amravati

**Table No. 21: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Godhadiwala Private Limited - Amravati**

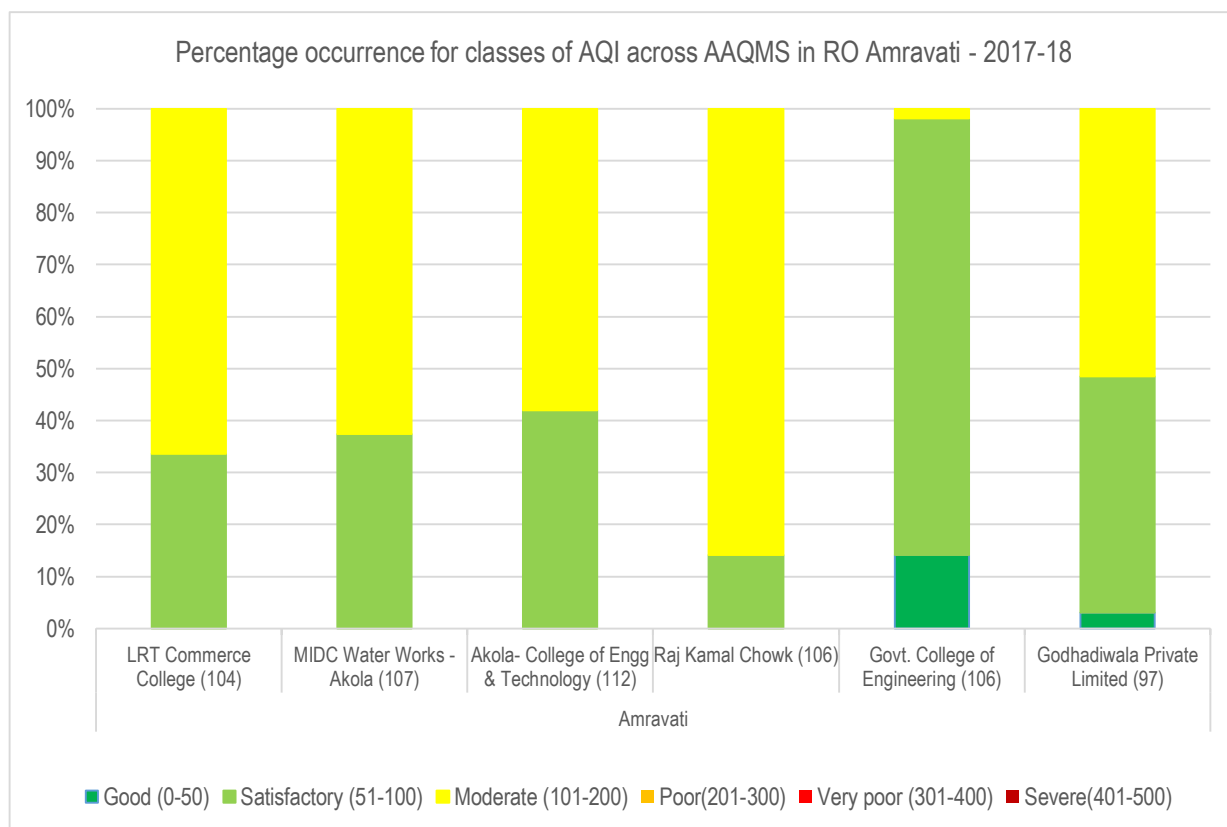
Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Godhadiwala Private Limited	06-07	12	16	67
	07-08	9	12	58
	08-09	10	13	71
	09-10	12	14	102
	10-11	12	14	125
	11-12	11	13	100
	12-13	12	13	101
	13-14	11	12	94
	14-15	12	14	108
	15-16	11	13	110
	16-17	12	13	108
	17-18	11	21	97



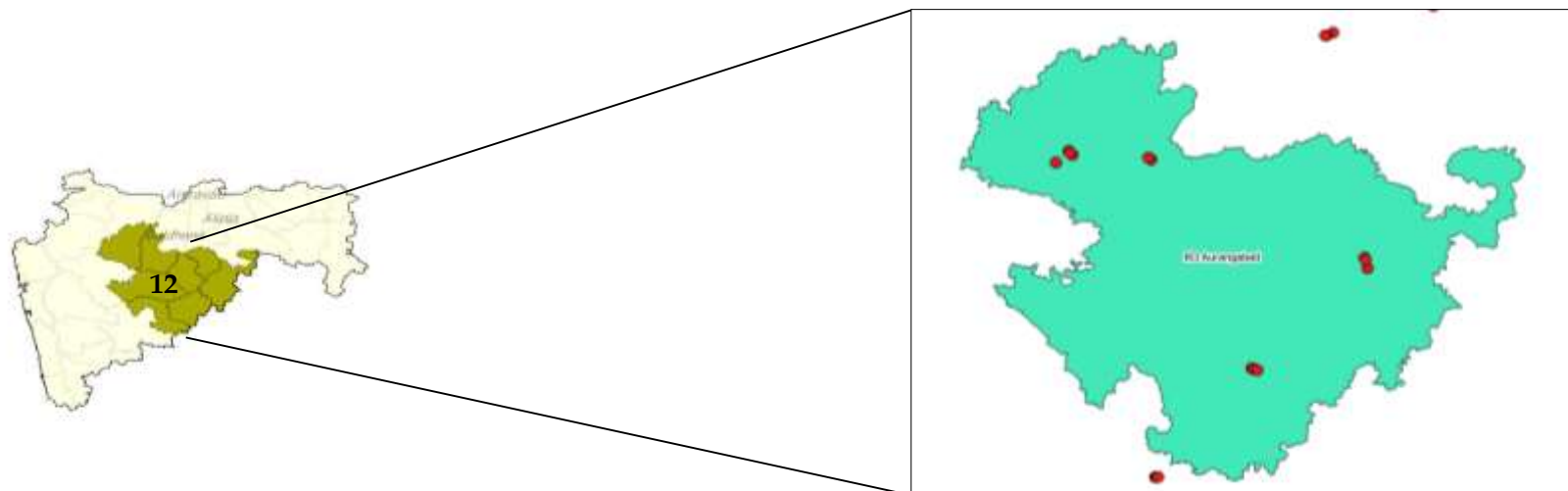
**Figure No. 30: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Godhadiwala Private Limited - Amravati**

**Table No. 22: Percentage exceedance of pollutants at Amravati RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
LRT Commerce College	104	0	0	69	0	0	66
MIDC Water Works - Akola	107	0	0	67	0	0	63
Akola- College of Engg & Technology	112	0	0	65	0	0	58
Raj Kamal Chowk	106	0	9	91	0	8	86
Govt. College of Engineering	106	0	0	2	0	0	2
Godhadiwala Private Limited	97	0	8	50	0	8	52



## RO – Aurangabad



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Aurangabad	Aurangabad	511	SBES College	Residential	19° 52' 54.9" N	75° 19' 33.7" E
	Aurangabad	512	Collector Office, Aurangabad	Residential	19° 53' 58.4" N	75° 19' 14.2" E
	Aurangabad	513	C.A.D.A. Office	Residential	19° 52' 14.3" N	75° 21' 03.5" E
	Jalna	706	Jalna- Bachat Bhavan	Residential	19° 50' 26.4" N	75° 52' 17.4" E
	Jalna	707	Jalna- Krishnadhan seeds Ltd	Industrial	19° 51' 04.3" N	75° 51' 14.4" E
	Latur	641	MIDC Water Works - Latur	Industrial	18° 24' 53.0" N	76° 32' 49.4" E
	Latur	642	Shyam Nagar-Kshewraj Vidyalaya	Residential	18° 24' 21.6" N	76° 33' 50.2" E
	Latur	643	Ganj Golai - Sidhshwar Bank	Rural and other areas	18° 23' 58.0" N	76° 35' 02.6" E
	Nanded	703	Ganeshnagar	Residential	19° 10' 16.3" N	77° 17' 56.3" E
	Nanded	704	Mutha Chowk	Commercial	19° 09' 16.8" N	77° 18' 34.9" E
	Nanded	705	Industrial Area CIDCO	Industrial	19° 05' 48.2" N	77° 19' 17.9" E
	Aurangabad			Aurangabad CAAQMS	Industrial	19° 48' 59.11"N

## Aurangabad - SBES College

Table No. 23: Data for Monthly average reading recorded at SBES College - Aurangabad

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
SBES College	2017	Apr	10	35	88
		May	9	31	104
		Jun	8	29	94
		Jul	8	29	70
		Aug	8	29	60
		Sep	7	26	42
		Oct	12	34	67
		Nov	10	32	75
		Dec	16	41	82
	2018	Jan	15	40	83
		Feb	14	39	87
		Mar	14	40	83

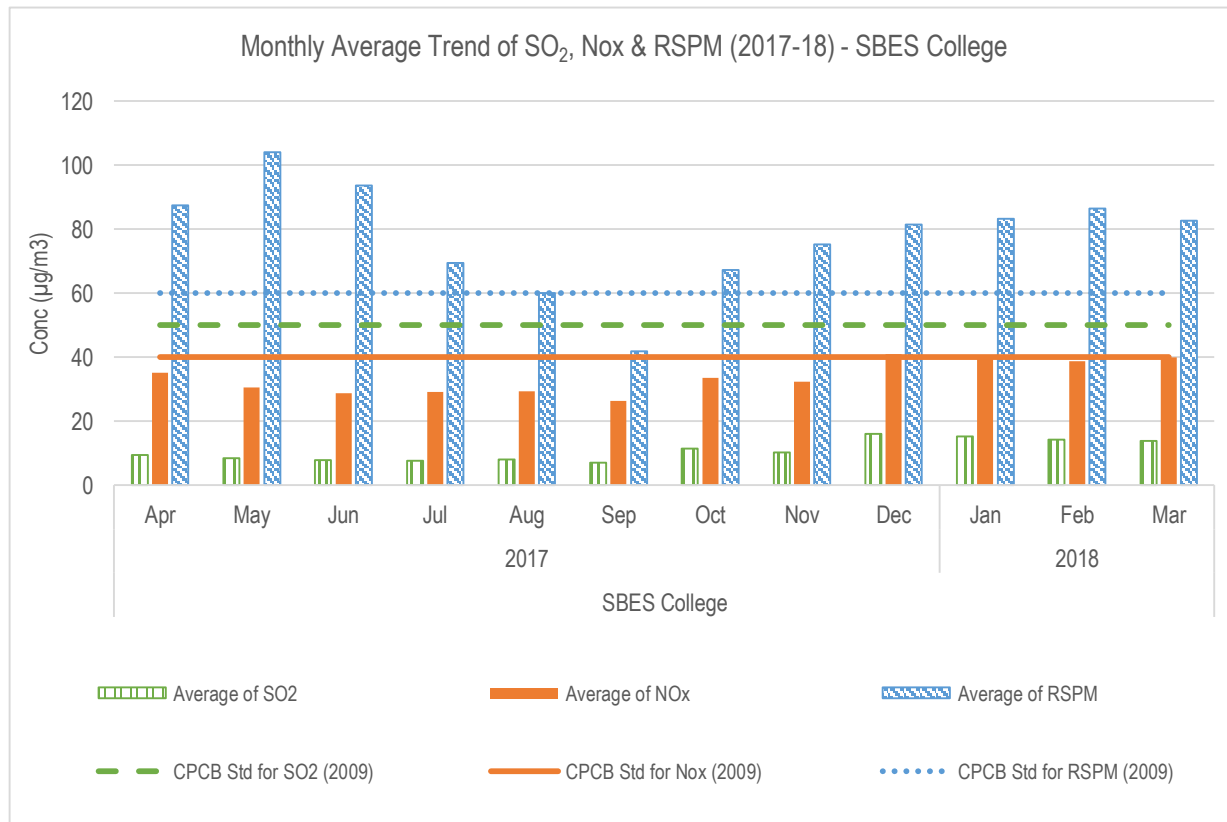


Figure No. 31: Monthly average reading recorded at SBES College - Aurangabad

Table No. 24: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at SBES College - Aurangabad

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
SBES College	05-06	7	30	166
	06-07	6	18	85
	07-08	6	22	79
	08-09	9	22	94
	09-10	7	25	98
	10-11	7	23	94
	11-12	9	33	90
	12-13	10	33	93
	13-14	11	39	102
	14-15	13	43	97
	15-16	16	44	111
	16-17	14	41	108
	17-18	11	33	78

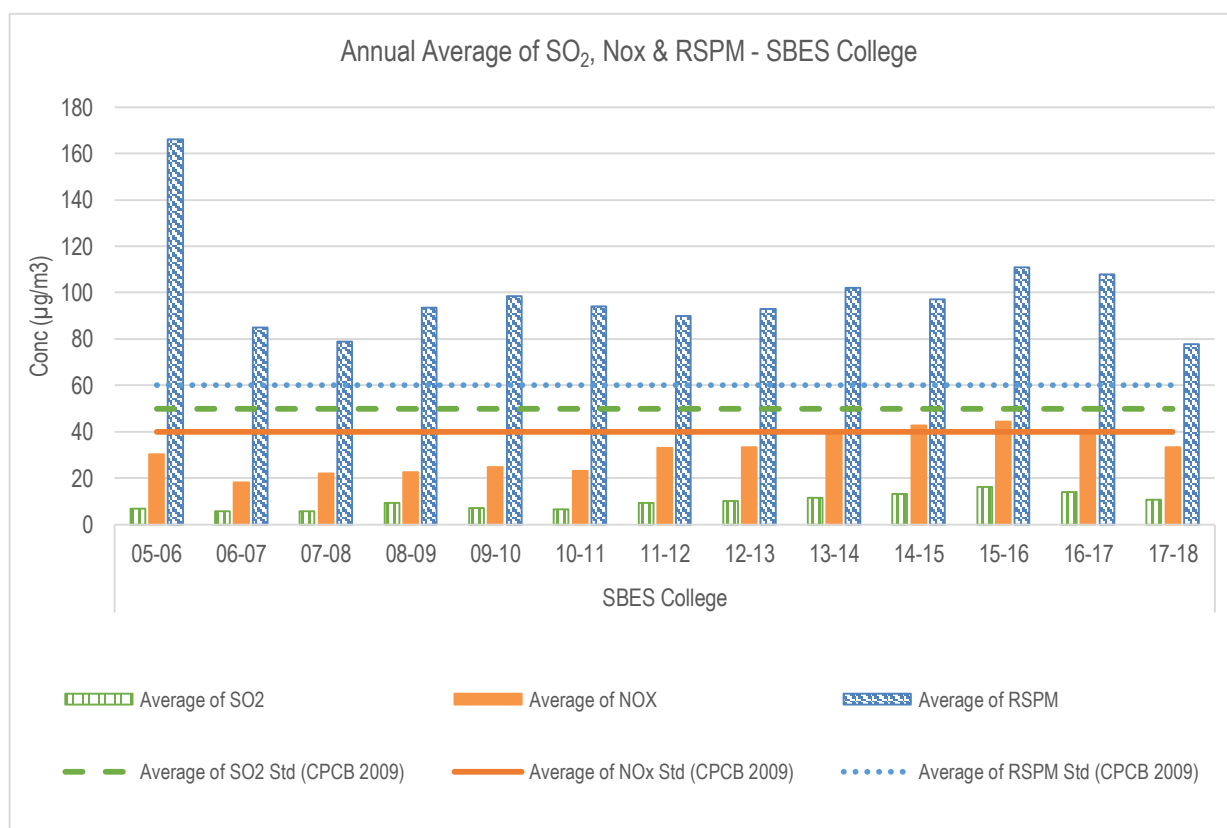


Figure No. 32: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at SBES College – Aurangabad

## Aurangabad - Collector Office

Table No. 25: Data for Monthly average reading recorded at Collector Office, Aurangabad

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Collector Office, Aurangabad	2017	Apr	8	30	89
		May	7	27	95
		Jun	7	27	85
		Jul	7	27	77
		Aug	6	24	48
		Sep	7	26	42
		Oct	9	30	63
		Nov	9	30	51
		Dec	13	37	80
	2018	Jan	13	36	83
		Feb	11	35	86
		Mar	11	36	85

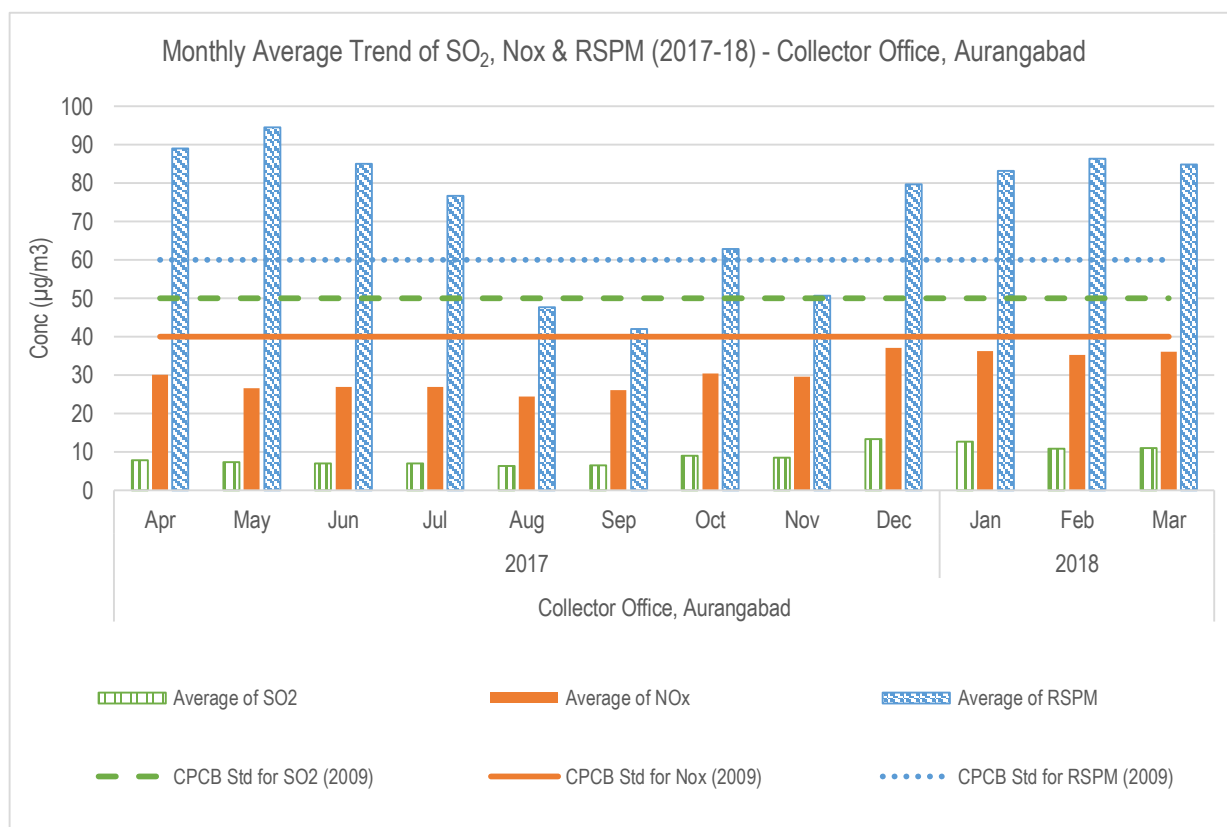
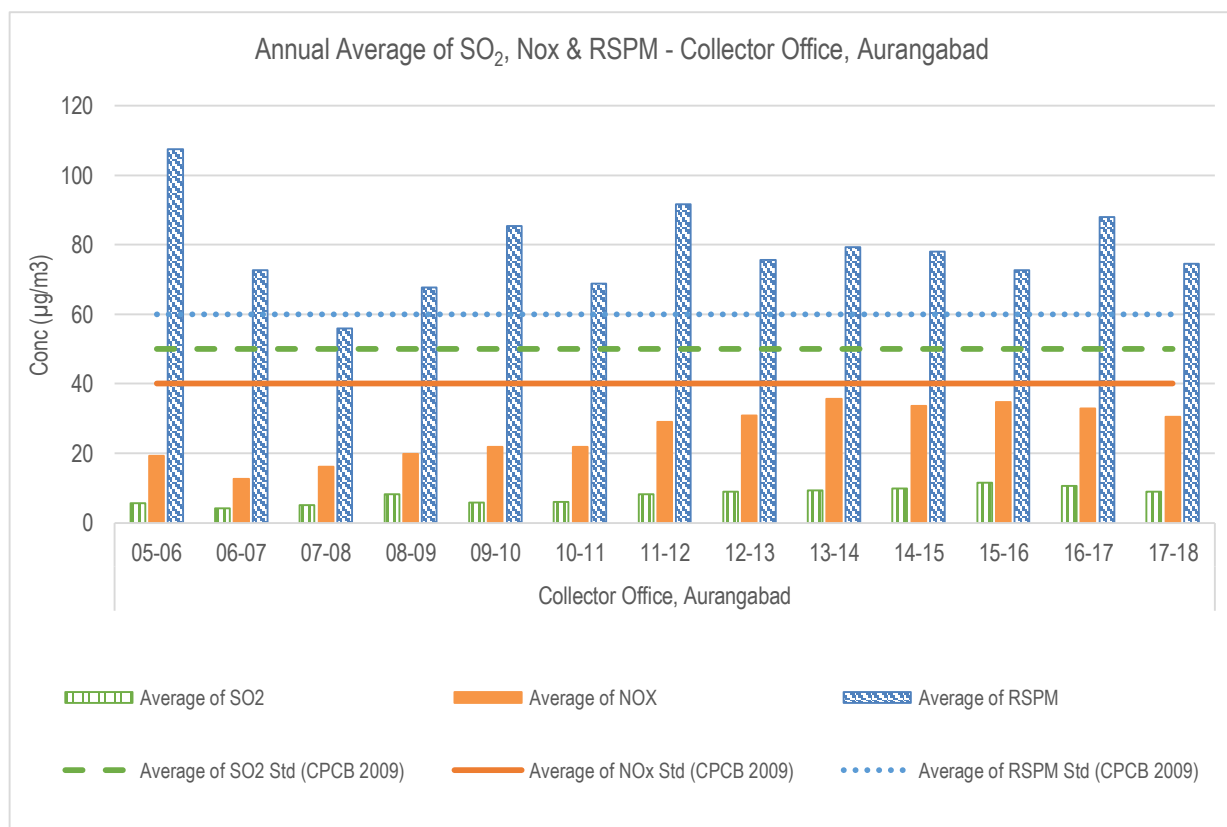


Figure No. 33: Monthly average reading recorded at Collector Office, Aurangabad

**Table No. 26: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Collector Office, Aurangabad**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Collector Office, Aurangabad	05-06	6	19	108
	06-07	4	13	73
	07-08	5	16	56
	08-09	8	20	68
	09-10	6	22	85
	10-11	6	22	69
	11-12	8	29	92
	12-13	9	31	76
	13-14	9	36	79
	14-15	10	34	78
	15-16	12	35	73
	16-17	11	33	88
	17-18	9	30	74



**Figure No. 34: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Collector Office, Aurangabad**



## Aurangabad - C.A.D.A. Office

Table No. 27: Data for Monthly average reading recorded at C.A.D.A. Office - Aurangabad

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
C.A.D.A. Office	2017	Apr	9	34	95
		May	8	29	99
		Jun	8	29	92
		Jul	8	28	75
		Aug	7	28	58
		Sep	7	27	42
		Oct	10	32	63
		Nov	10	31	74
		Dec	15	40	84
	2018	Jan	14	38	93
		Feb	12	37	88
		Mar	13	39	85

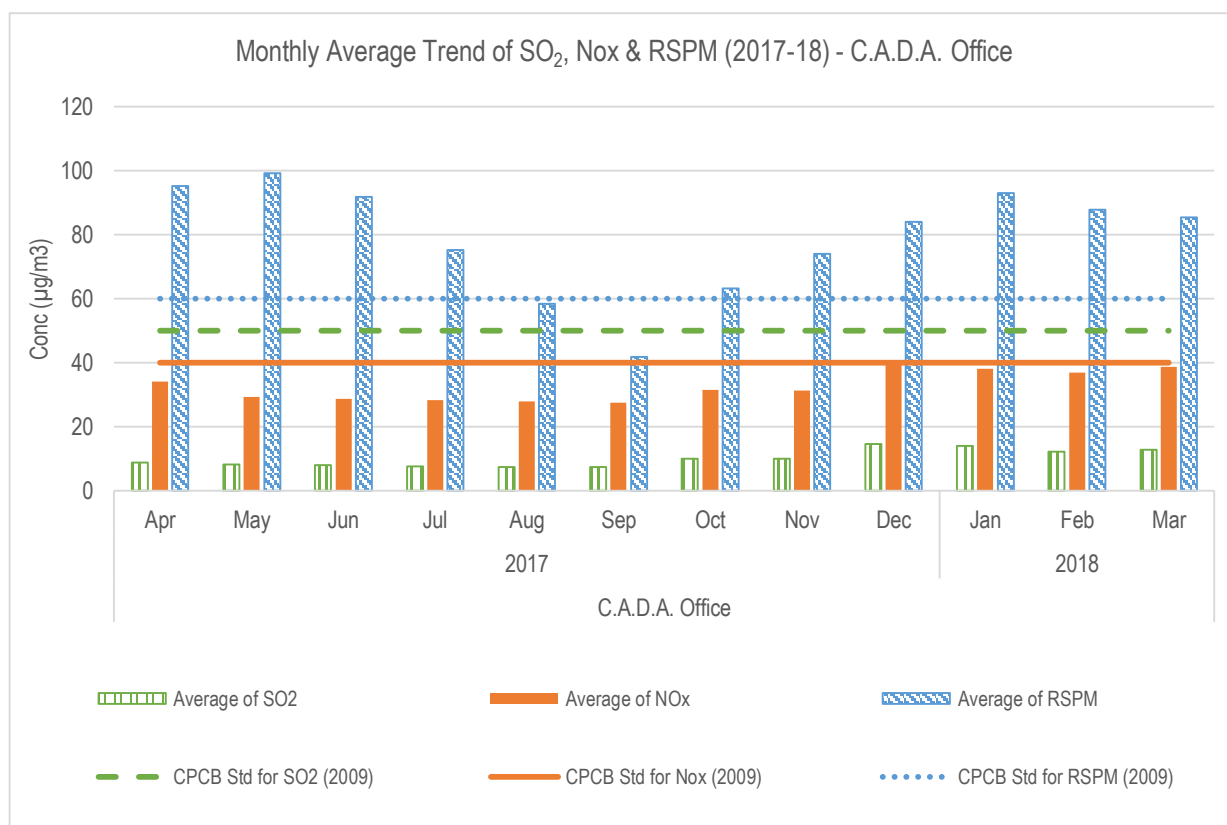


Figure No. 35: Monthly average reading recorded at C.A.D.A. Office - Aurangabad

Table No. 28: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at C.A.D.A. Office - Aurangabad

Station Name	year	Average of SO2	Average of NOX	Average of RSPM
		50	40	60
C.A.D.A. Office	05-06	7	23	119
	06-07	5	19	79
	07-08	5	23	79
	08-09	9	21	63
	09-10	6	22	66
	10-11	6	22	69
	11-12	10	34	75
	12-13	11	35	68
	13-14	10	38	74
	14-15	12	40	79
	15-16	15	43	75
	16-17	13	39	82
	17-18	9	31	76

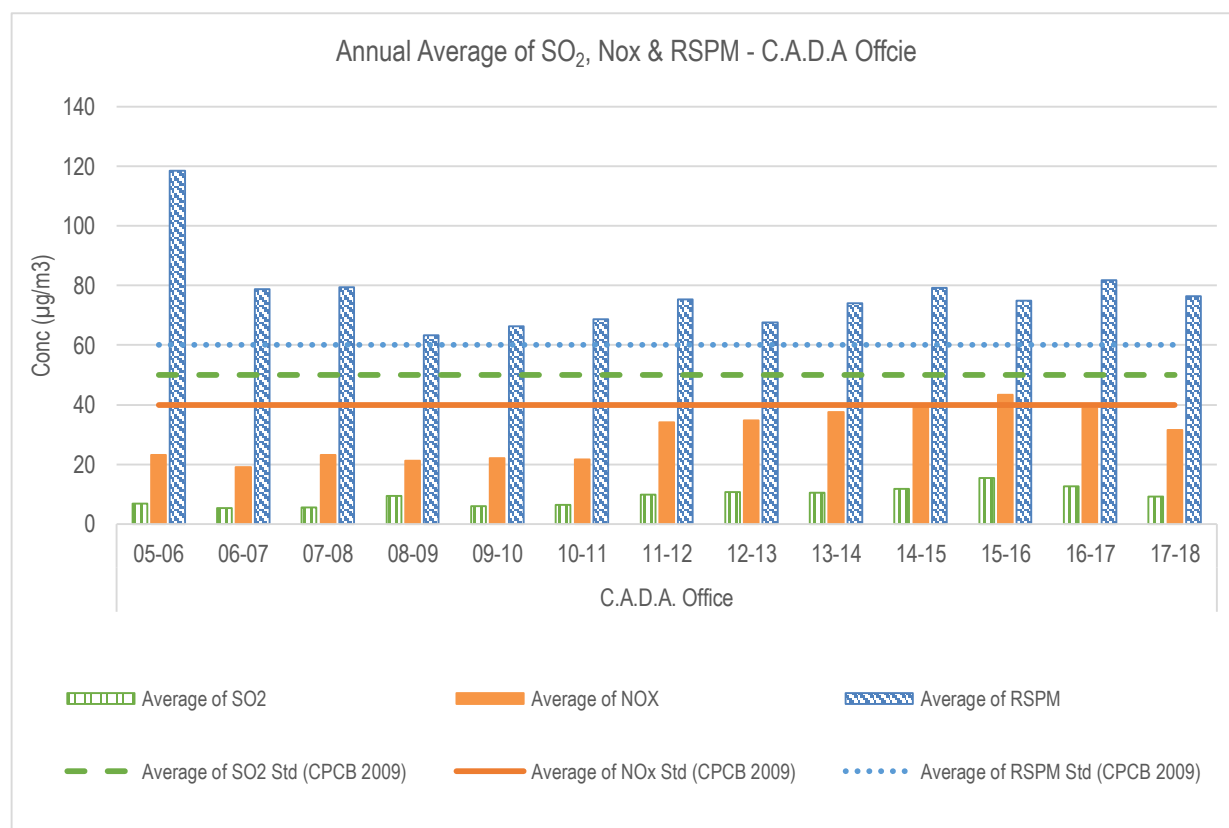


Figure No. 36: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at C.A.D.A. Office – Aurangabad

## Jalna - Bachat Bhavan

Table No. 29: Data for Monthly average reading recorded at Jalna - Bachat Bhavan

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Jalna- Bachat Bhavan	2017	Apr	11	49	119
		May	8	38	121
		Jun	9	37	117
		Jul	7	33	104
		Aug	8	32	95
		Sep	7	32	89
		Oct	8	33	90
		Nov	11	47	112
		Dec	11	43	116
	2018	Jan	10	43	124
		Feb	11	48	116

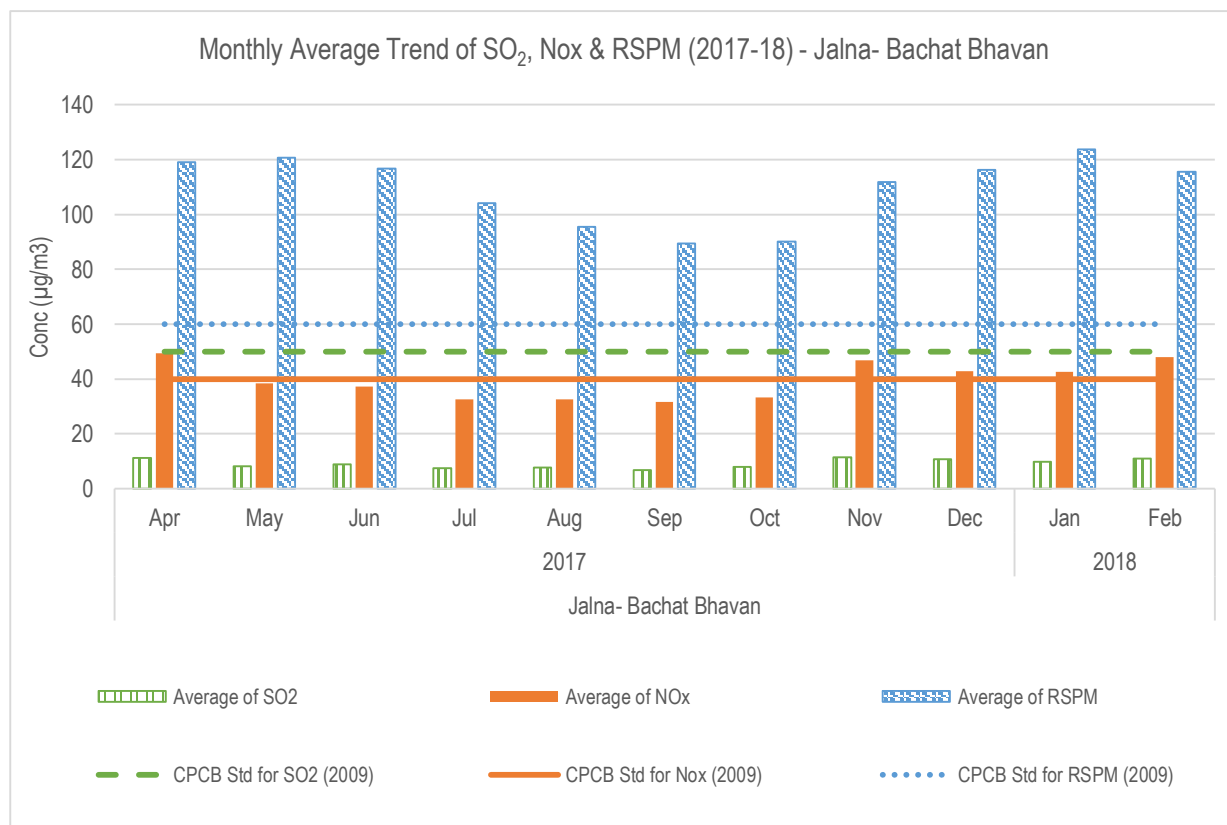


Figure No. 37: Monthly average reading recorded at Jalna-Bachat Bhavan

Table No. 30: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Jalna-Bachat Bhavan

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Jalna- Bachat Bhavan	06-07	13	22	53
	07-08	17	28	87
	08-09	17	32	66
	09-10	5	28	84
	10-11	5	26	73
	11-12	6	25	89
	12-13	10	30	97
	13-14	10	30	100
	14-15	9	29	94
	15-16	11	29	111
	16-17	10	33	128
	17-18	9	40	110

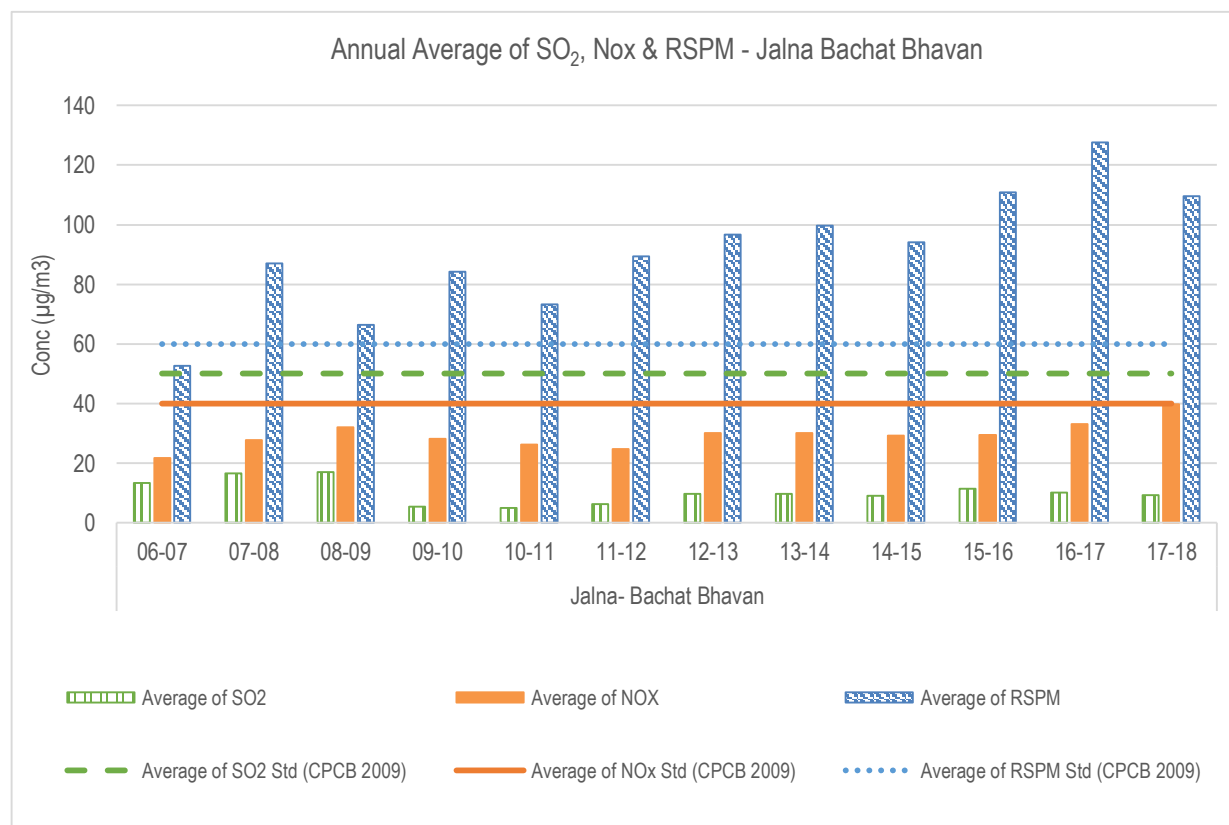


Figure No. 38: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Jalna-Bachat Bhavan

### Jalna - Krishnadhan Seeds Ltd.

Table No. 31: Data for Monthly average reading recorded at Jalna-Krishnadhan Seeds Ltd.

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Jalna- Krishnadhan seeds Ltd	2017	Apr	11	42	80
		May	10	37	78
		Jun	9	39	87
		Jul	7	32	85
		Aug	9	36	79
		Sep	7	32	71
		Oct	8	32	82
		Nov	11	43	97
	Dec	11	38	98	
	2018	Jan	10	45	96
		Feb	10	49	97
Mar		12	48	98	

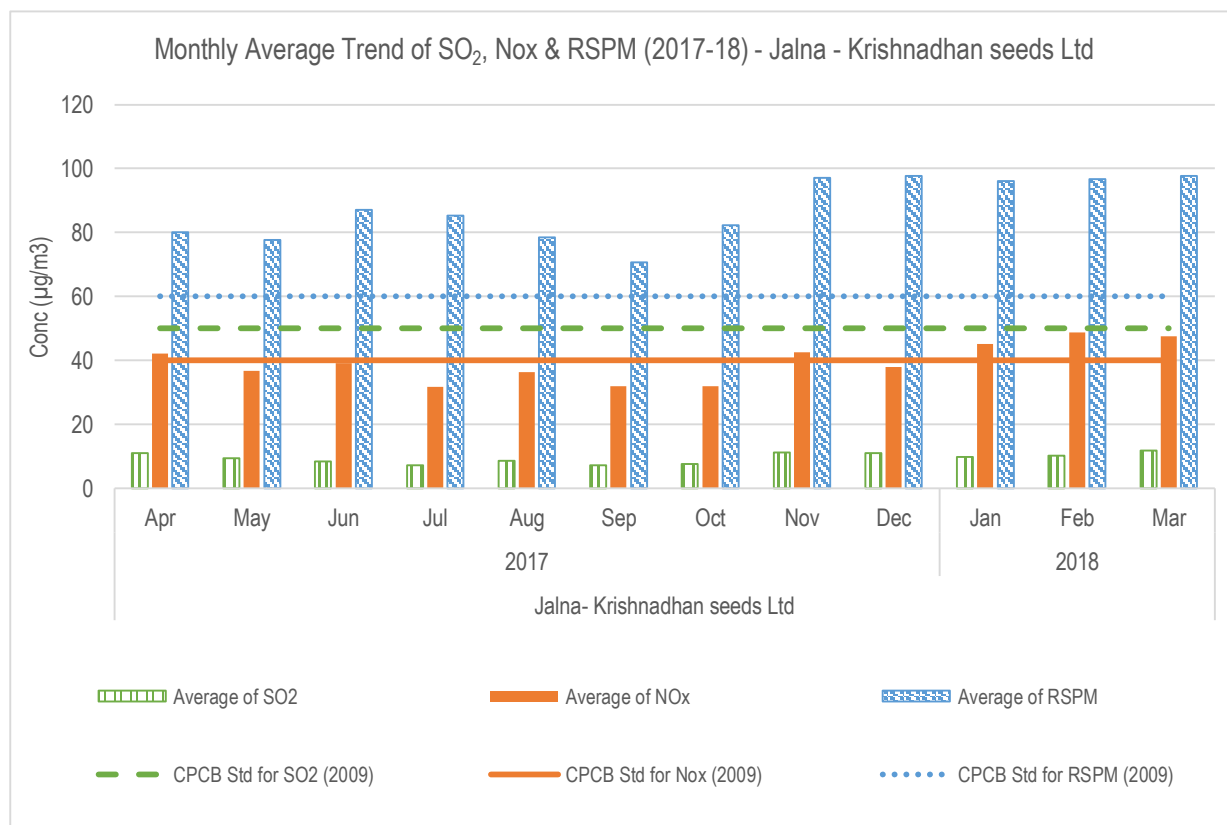


Figure No. 39: Monthly average reading recorded at Jalna-Krishnadhan Seeds Ltd.

Table No. 32: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Jalna - Krishnadhan Seeds Ltd.

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Jalna- Krishnadhan seeds Ltd	06-07	17	29	125
	07-08	28	44	140
	08-09	30	45	182
	09-10	13	37	111
	10-11	7	33	139
	11-12	8	26	140
	12-13	11	32	143
	13-14	11	31	150
	14-15	11	31	180
	15-16	12	30	103
	16-17	12	31	83
	17-18	9	39	87

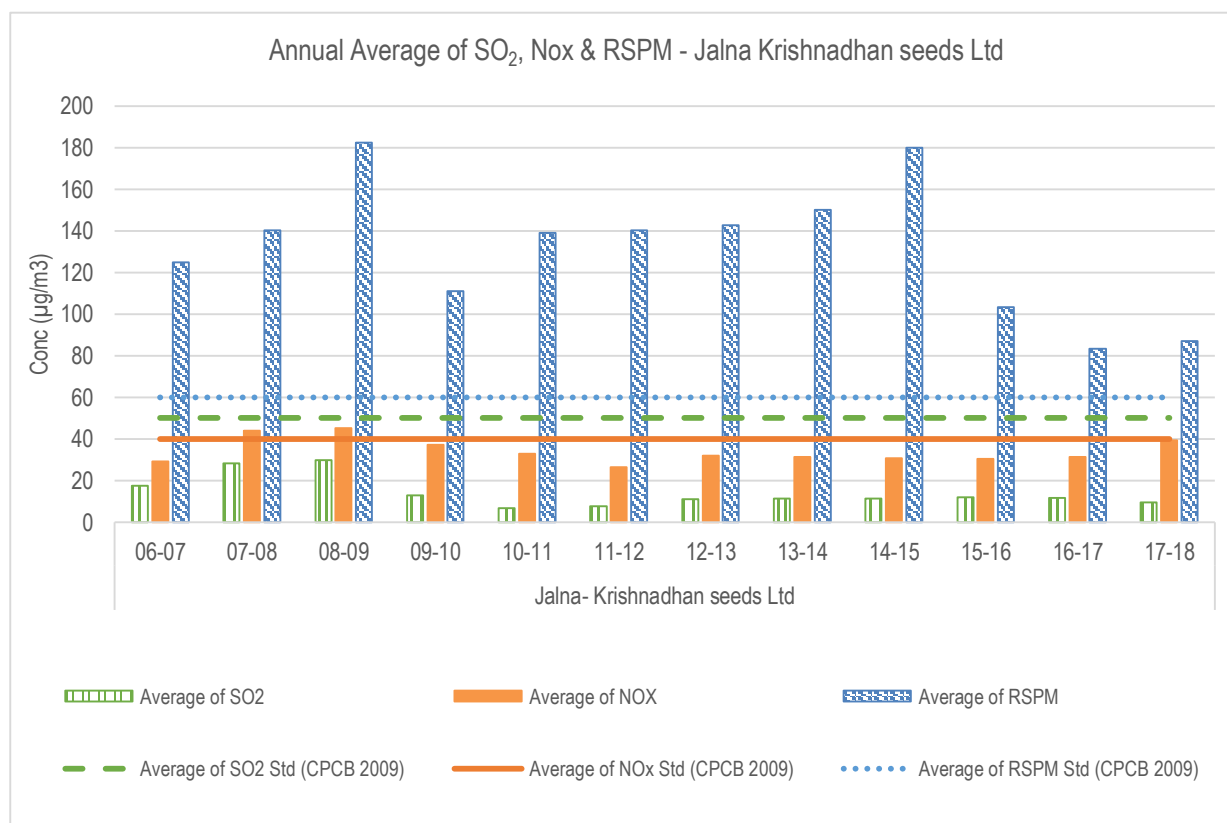


Figure No. 40: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Jalna-Krishnadhan Seeds Ltd.

## Latur - MIDC Water Works

Table No. 33: Data for Monthly average reading recorded at MIDC Water Works - Latur

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
MIDC Water Works - Latur	2017	Apr	6	19	119
		May	6	19	81
		Jun	5	16	42
		Jul	5	16	43
		Aug	5	19	69
		Sep	5	19	64
		Oct	6	24	66
		Nov	6	21	76
		Dec	6	22	100
	2018	Jan	6	25	107
		Feb	6	23	110
		Mar	6	25	116

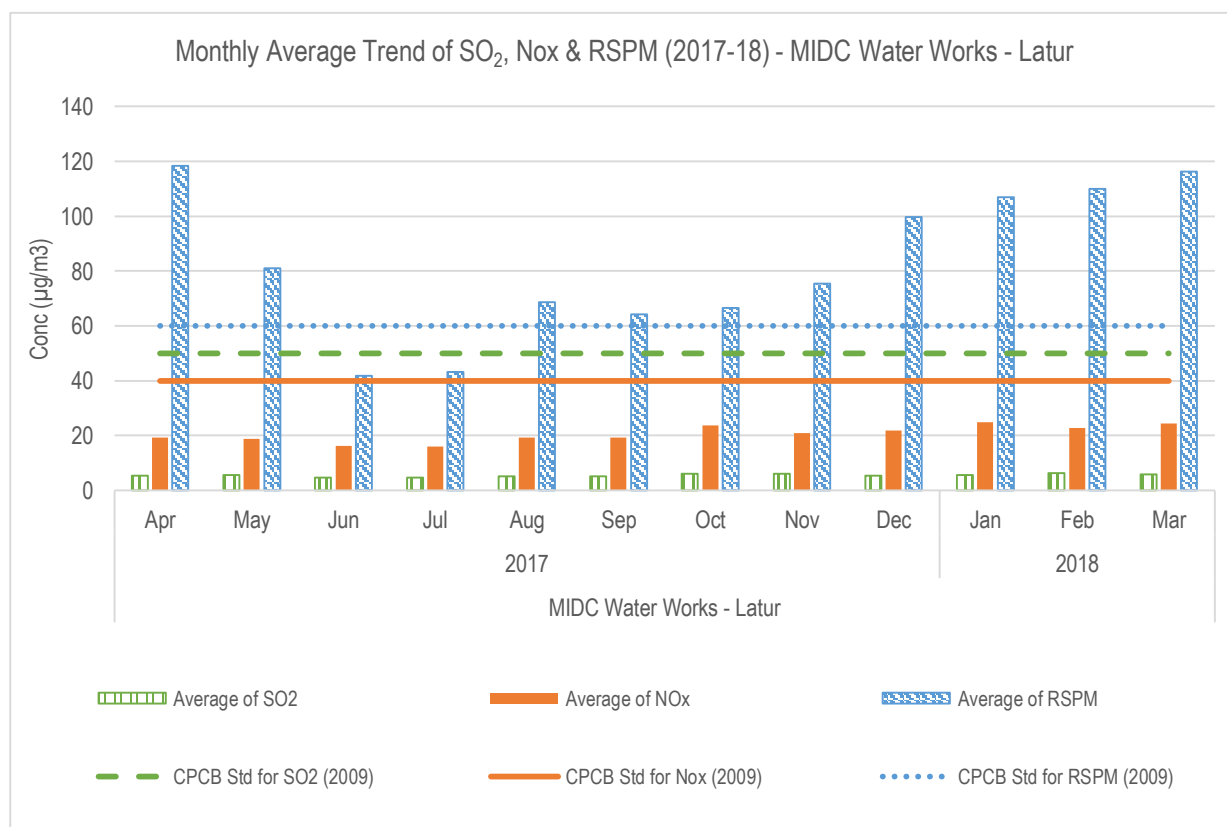
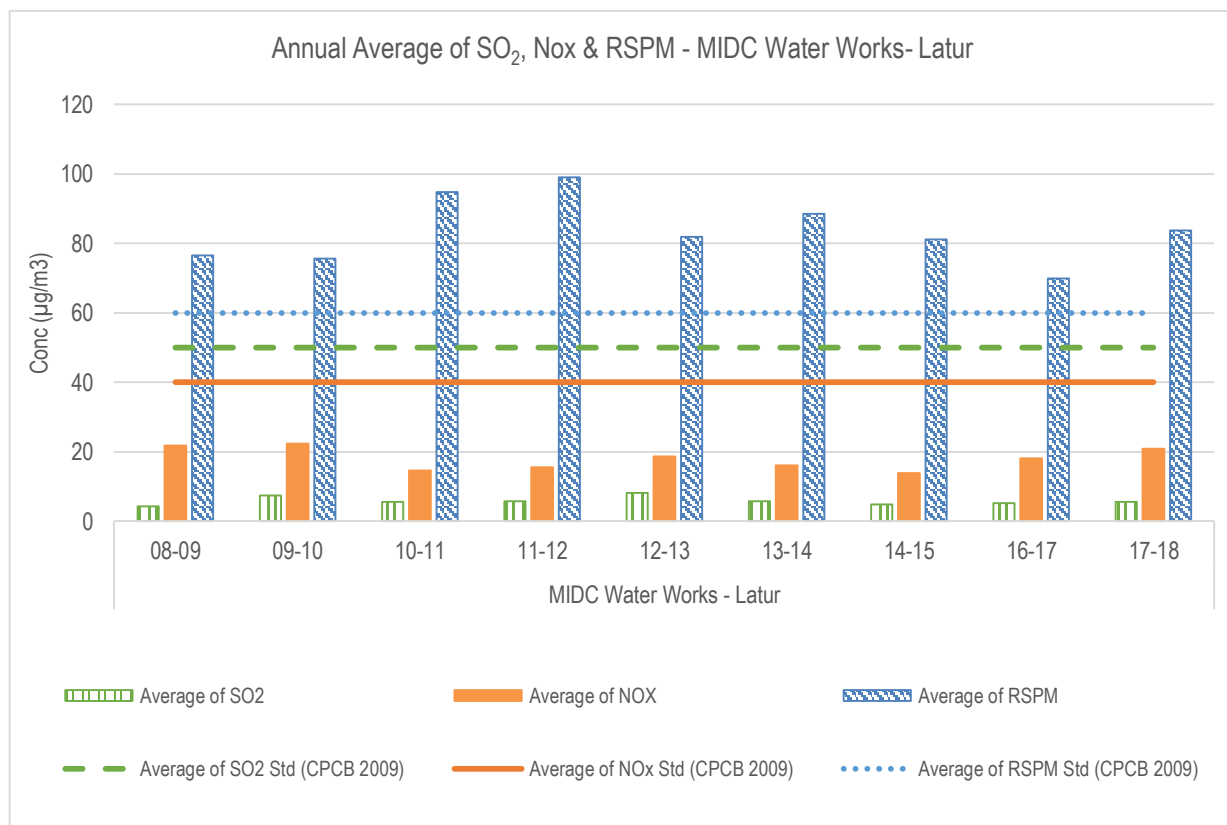


Figure No. 41: Monthly average reading recorded at MIDC Water Works – Latur

**Table No. 34: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Water Works - Latur**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
MIDC Water Works - Latur	08-09	4	22	77
	09-10	7	22	76
	10-11	6	15	95
	11-12	6	16	99
	12-13	8	19	82
	13-14	6	16	88
	14-15	5	14	81
	16-17	5	18	70
	17-18	6	21	84



**Figure No. 42: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Water Works - Latur**



## Latur - Shyam Nagar - Kshewraj Vidyalaya

Table No. 35: Data for Monthly average reading recorded at Shyam Nagar-Kshewraj Vidyalaya

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Shyam Nagar-Kshewraj Vidyalaya	2017	Apr	6	20	98
		May	6	19	75
		Jun	5	17	47
		Jul	5	17	55
		Aug	5	20	74
		Sep	5	20	53
		Oct	6	23	92
		Nov	6	21	88
		Dec	6	23	98
	2018	Jan	6	24	94
		Feb	6	23	121
		Mar	5	24	114

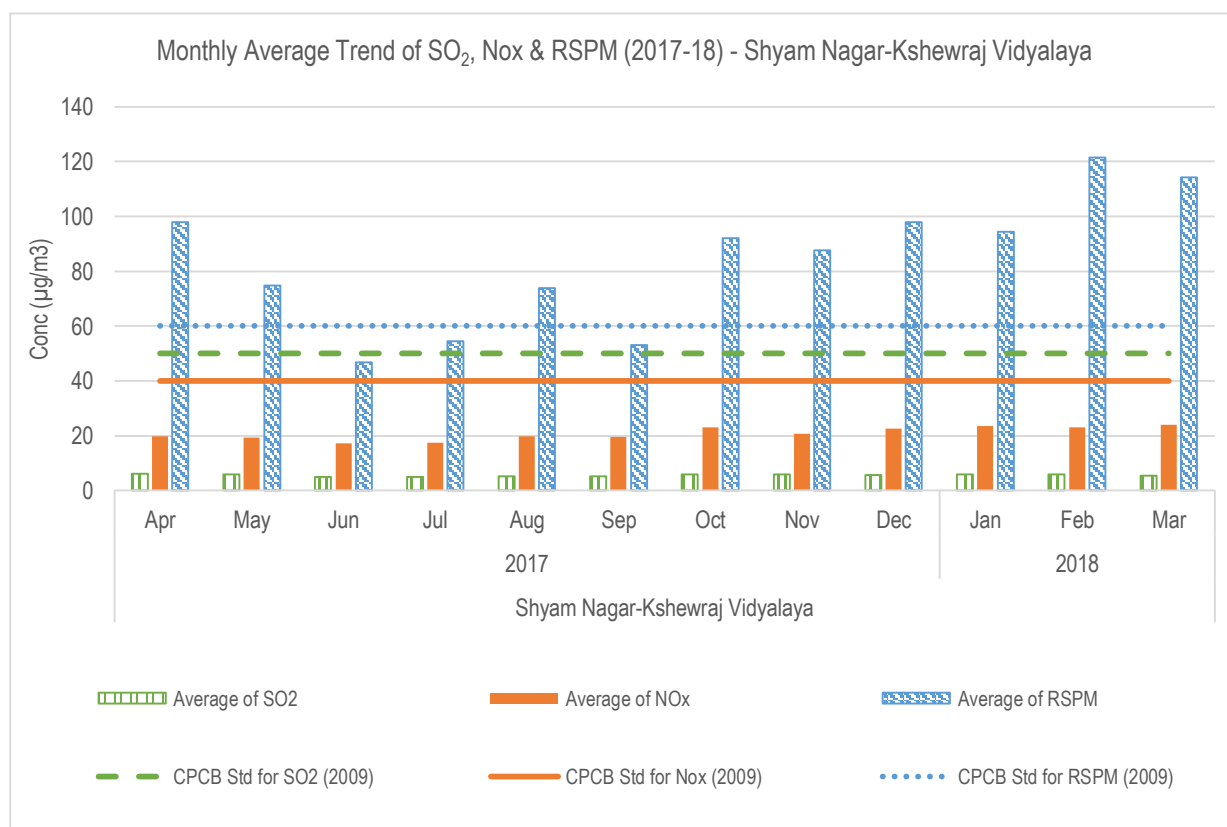


Figure No. 43: Monthly average reading recorded at Shyam Nagar-Kshewraj Vidyalaya

Table No. 36: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Shyam Nagar-Kshewraj Vidyalaya

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Shyam Nagar-Kshewraj Vidyalaya	08-09	3	16	99
	09-10	6	19	123
	10-11	6	13	139
	11-12	6	14	124
	12-13	7	19	105
	13-14	7	17	95
	14-15	5	14	89
	15-16	5	15	85
	16-17	5	18	72
	17-18	6	21	84

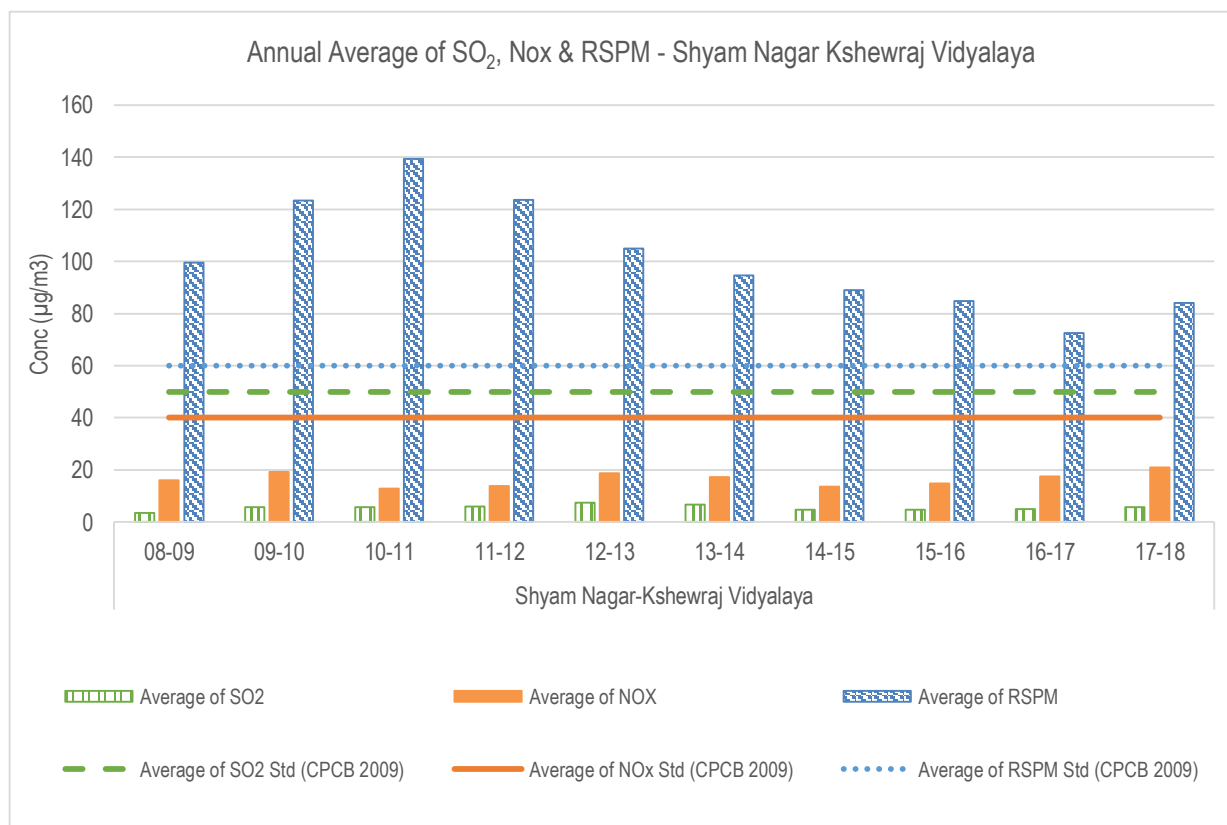


Figure No. 44: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Shyam Nagar-Kshewraj Vidyalaya

## Latur - Ganj Golai - Sidhsheshwar Bank

Table No. 37: Data for Monthly average reading recorded at Ganj Golai- Sidhsheshwar Bank

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Ganj Golai - Sidhsheshwar Bank	2017	Apr	6	20	98
		May	6	20	94
		Jun	5	17	57
		Jul	5	18	53
		Aug	5	20	44
		Sep	5	20	43
		Oct	6	25	51
		Nov	6	22	85
		Dec	6	22	92
	2018	Jan	6	25	96
		Feb	6	23	122
		Mar	6	25	106

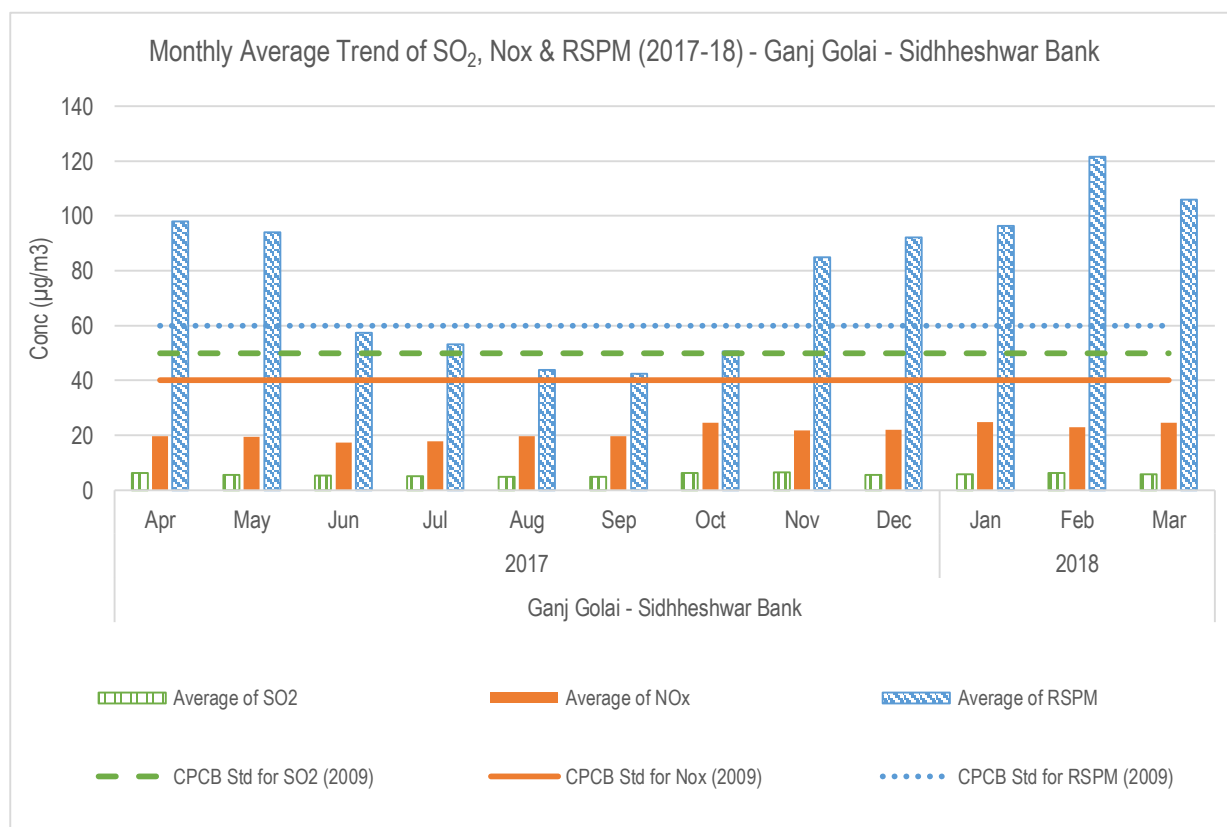


Figure No. 45: Monthly average reading recorded at Ganj Golai- Sidhsheshwar Bank

Table No. 38: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ganj Golai- Sidhsheshwar Bank

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Ganj Golai - Sidhsheshwar Bank	08-09	4	22	122
	09-10	6	26	144
	10-11	6	16	124
	11-12	6	17	140
	12-13	8	20	132
	13-14	7	18	107
	14-15	5	14	73
	15-16	5	17	80
	16-17	6	18	65
	17-18	6	21	78

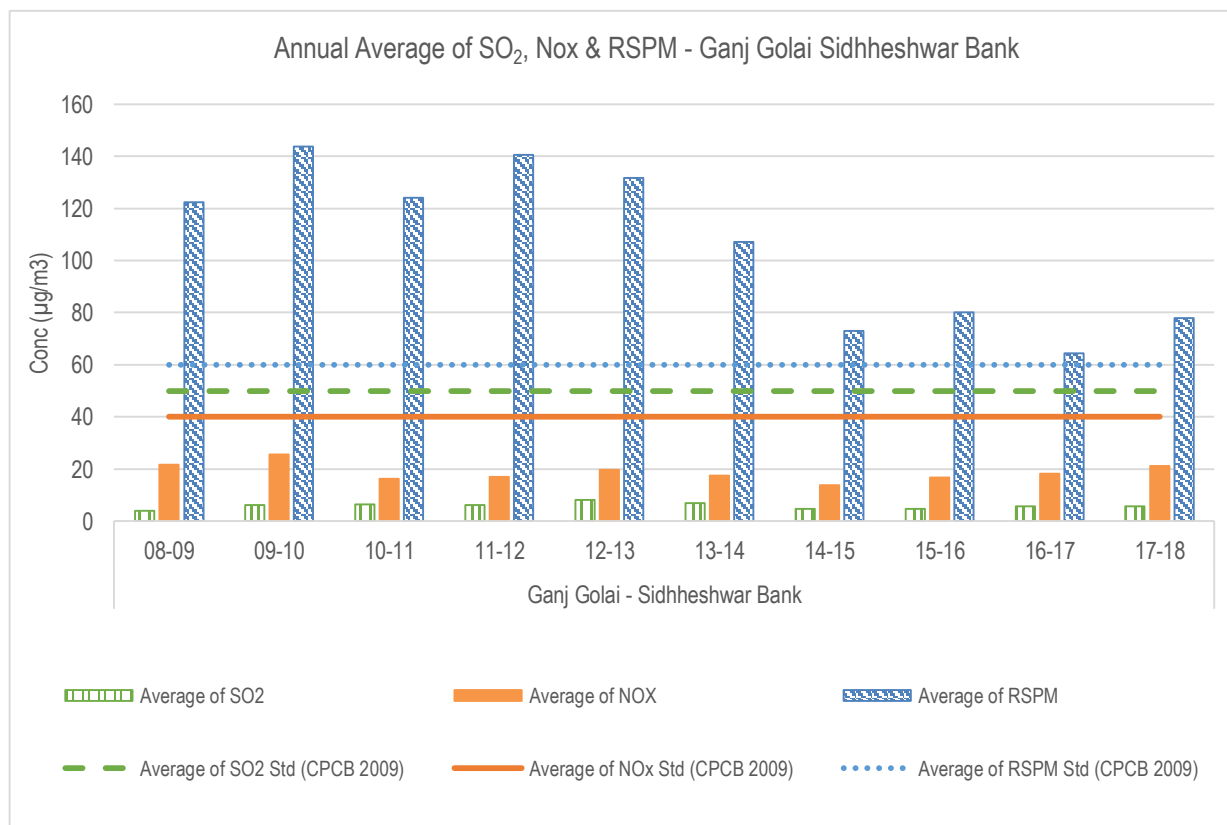


Figure No. 46: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ganj Golai- Sidhsheshwar Bank

## Nanded - Ganeshnagar

Table No. 39: Data for Monthly average reading recorded at Ganeshnagar

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Ganeshnagar	2017	Apr	25	28	20
		May	14	13	25
		Jun	26	27	26
		Jul	28	28	25
		Aug	22	26	22
		Sep	22	26	20
		Oct	21	26	21
		Nov	27	34	46
		Dec	29	36	49
	2018	Jan	27	28	59
		Feb	18	30	53
		Mar	18	30	57

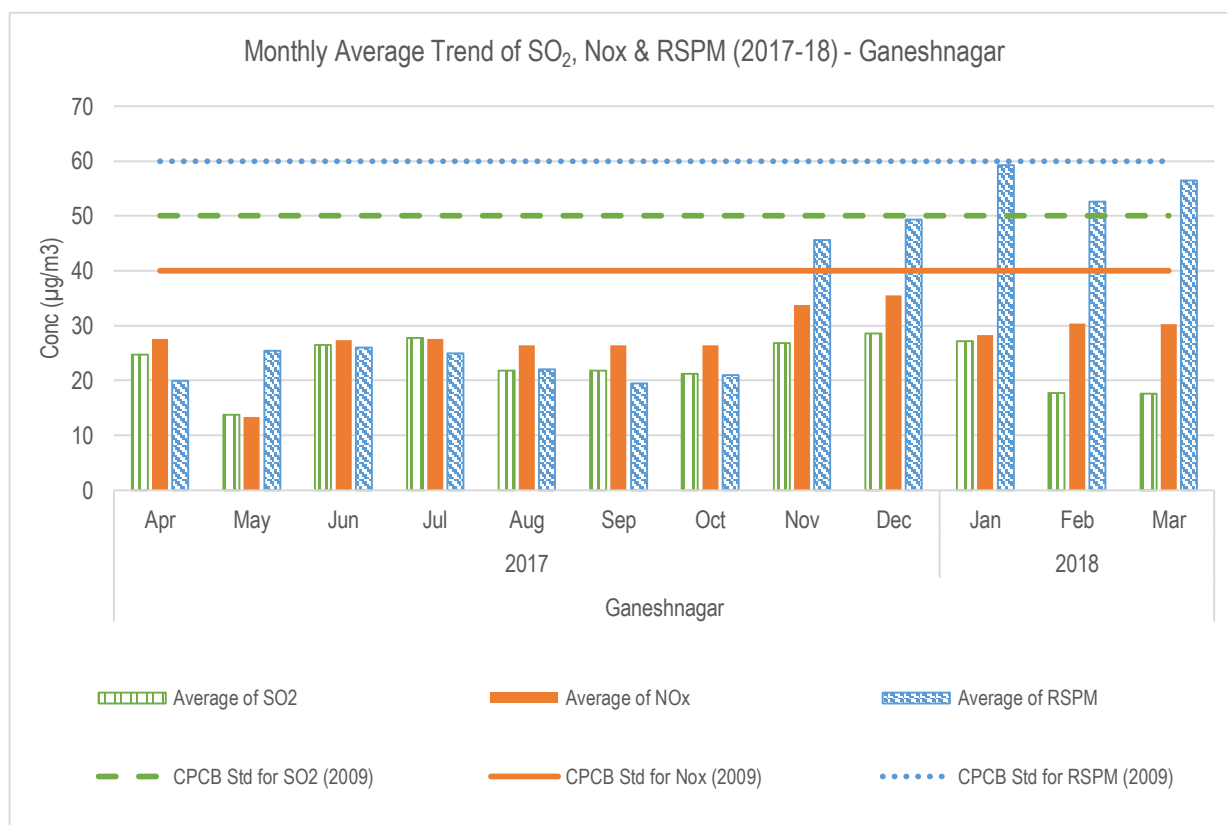


Figure No. 47: Monthly average reading recorded at Ganeshnagar

Table No. 40: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ganeshnagar

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Ganeshnagar	10-11	28	29	47
	11-12	18	19	26
	12-13	22	21	36
	13-14	17	16	29
	14-15	28	28	89
	15-16	27	28	117
	16-17	25	26	79
	17-18	23	28	35

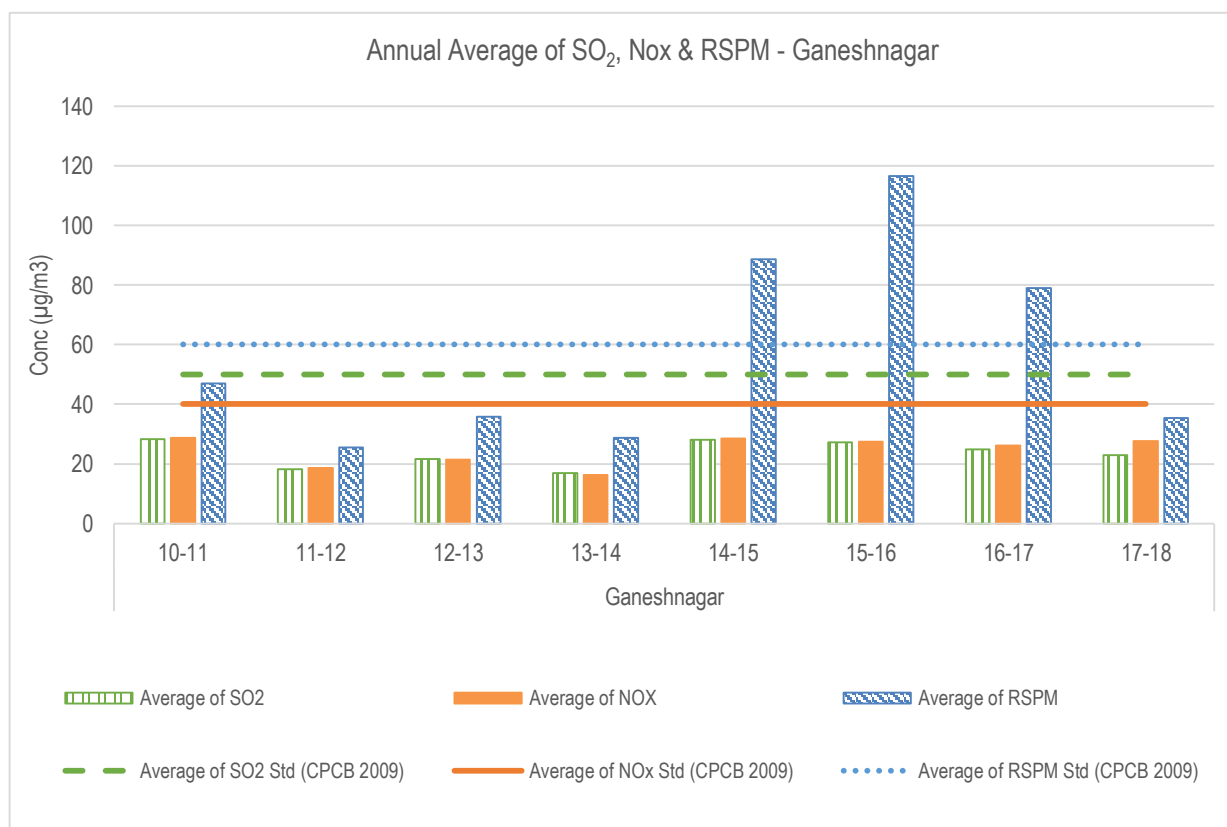


Figure No. 48: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ganeshnagar

## Nanded - Mutha Chowk

Table No. 41: Data for Monthly average reading recorded at Mutha Chowk

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Mutha Chowk	2017	Apr	36	32	39
		May	39	32	41
		Jun	37	32	41
		Jul	39	32	41
		Aug	33	31	40
		Sep	32	30	39
		Oct	31	30	39
		Nov	37	38	41
		Dec	39	43	41
	2018	Jan	33	37	40
		Feb	32	35	39
		Mar	31	31	39

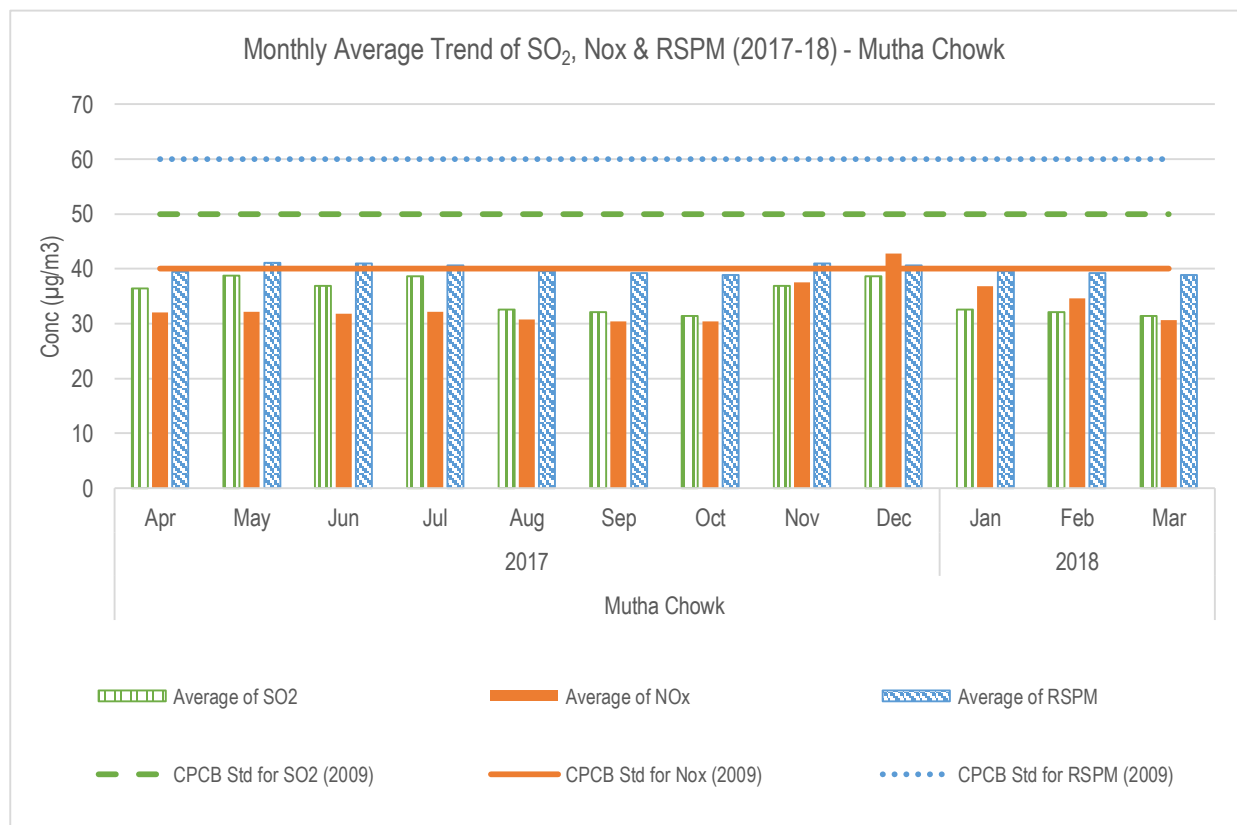


Figure No. 49: Monthly average reading recorded at Mutha Chowk

Table No. 42: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Mutha Chowk

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Mutha Chowk	11-12	28	28	44
	12-13	27	25	53
	13-14	25	21	62
	14-15	39	33	124
	15-16	38	32	173
	16-17	36	31	113
	17-18	35	34	40

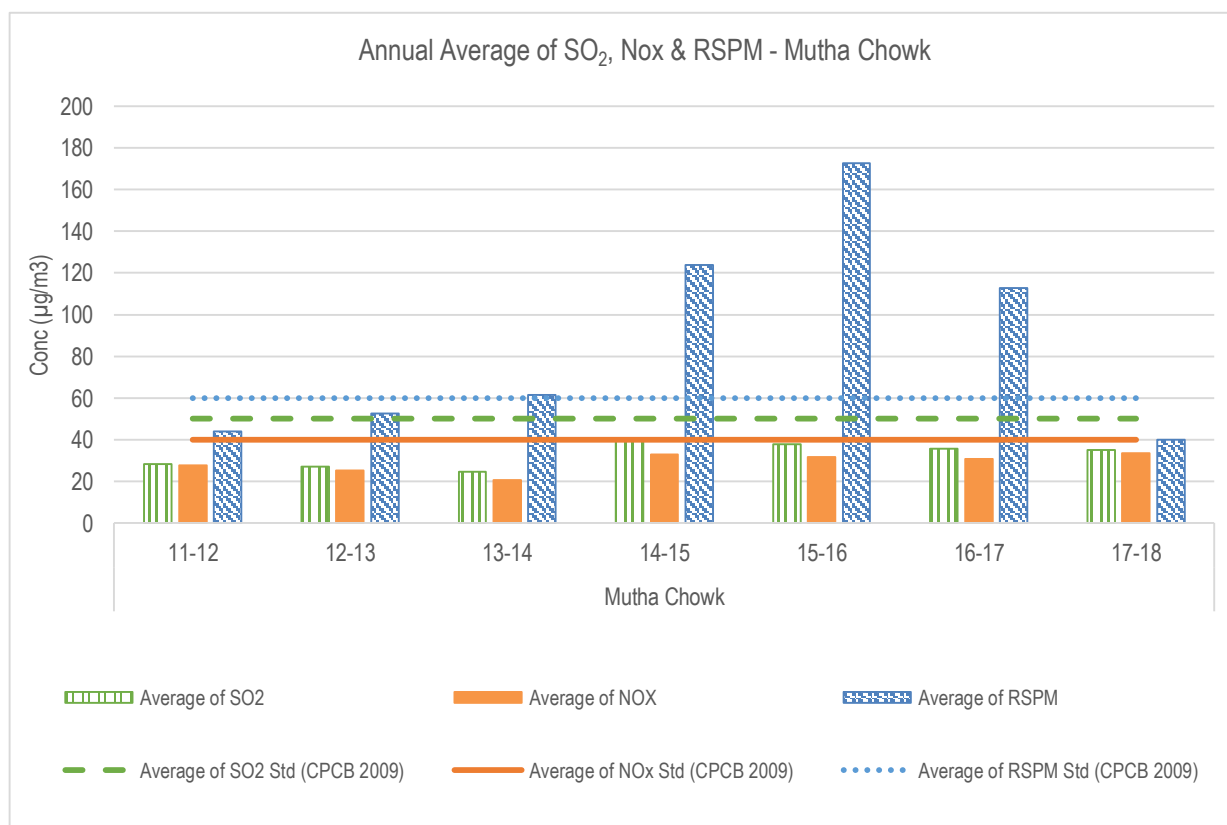


Figure No. 50: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Mutha Chowk



## Nanded - Industrial Area CIDCO

Table No. 43: Data for Monthly average reading recorded at Industrial Area CIDCO

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Industrial Area CIDCO	2017	Apr	81	87	63
		May	45	48	66
		Jun	59	60	64
		Jul	66	66	64
		Aug	52	57	62
		Sep	54	59	62
		Oct	54	60	63
		Nov	22	42	64
		Dec	29	49	64
	2018	Jan	31	34	62
		Feb	37	36	62
		Mar	35	41	63

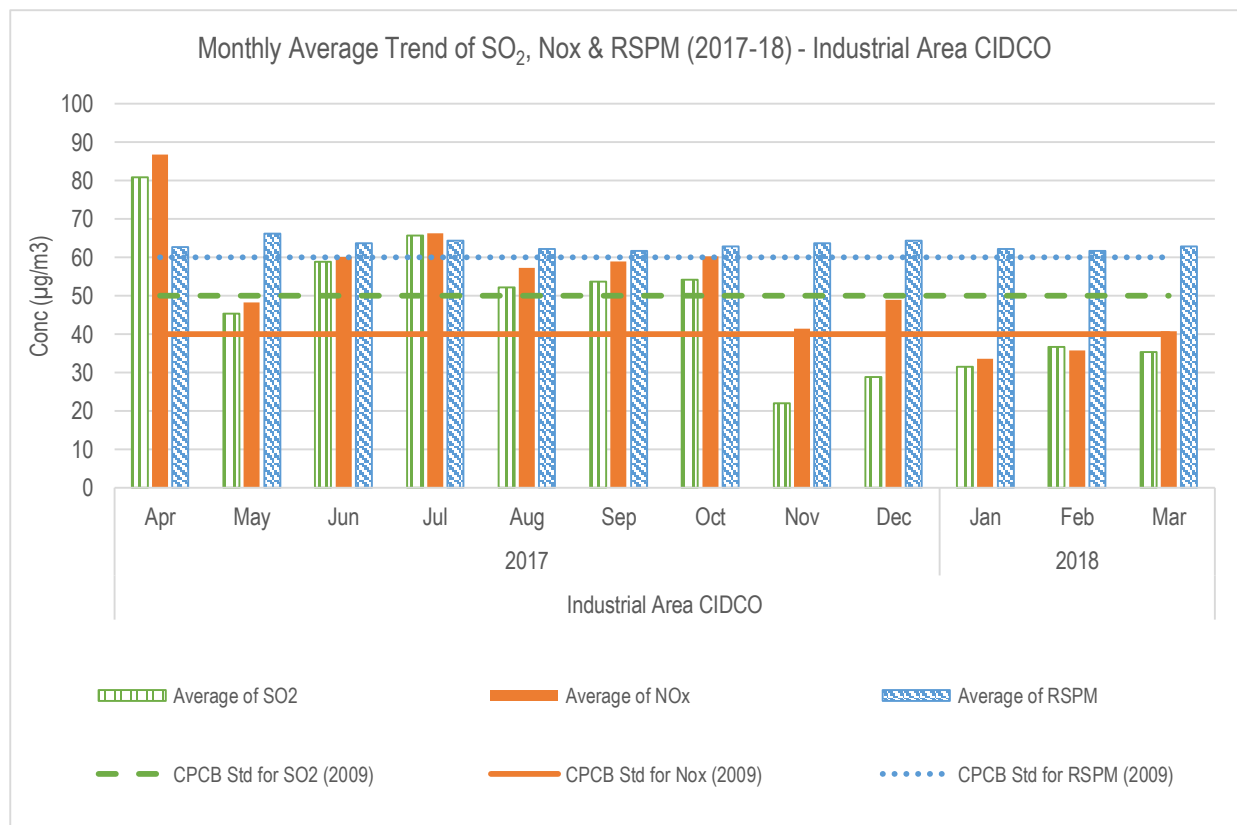
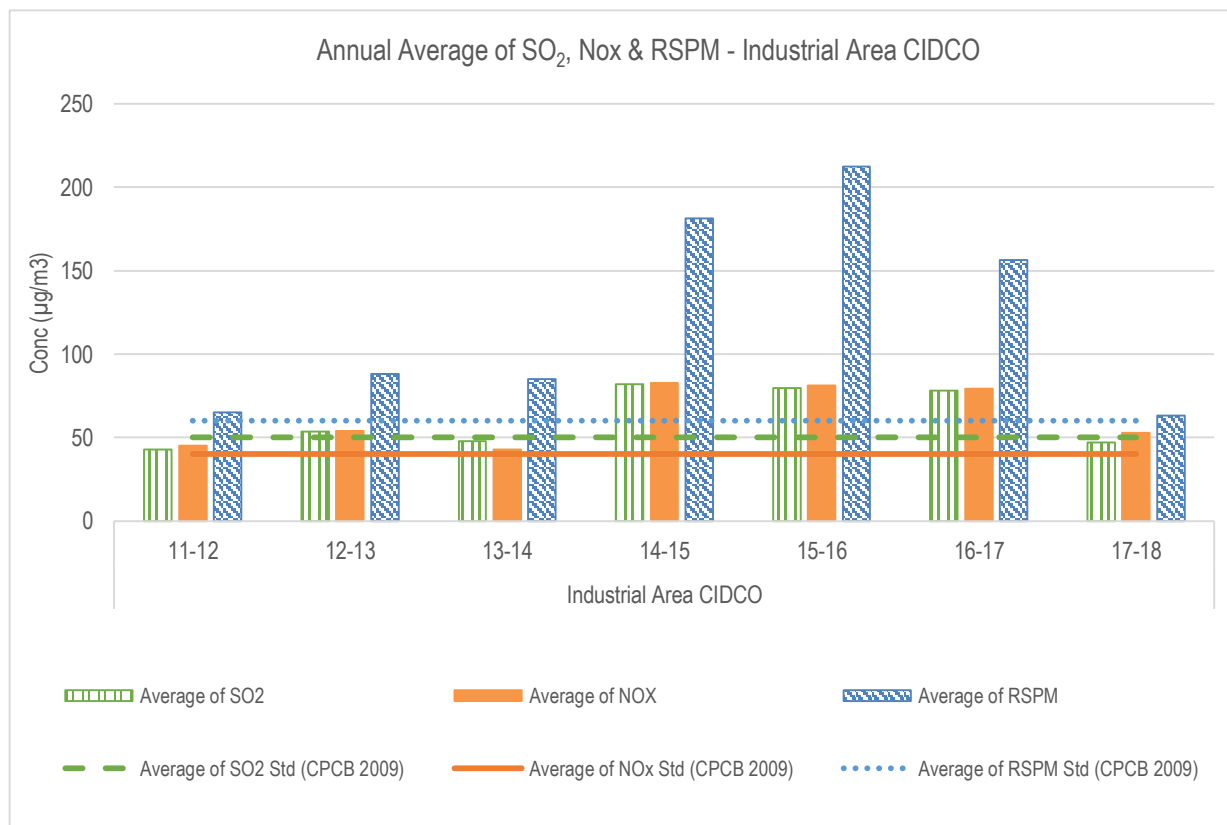


Figure No. 51: Monthly average reading recorded at Industrial Area CIDCO

**Table No. 44: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Industrial Area CIDCO**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Industrial Area CIDCO	11-12	43	45	65
	12-13	53	54	88
	13-14	48	43	85
	14-15	82	83	181
	15-16	80	81	212
	16-17	78	79	156
	17-18	47	53	63



**Figure No. 52: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Industrial Area CIDCO**

## Aurangabad - Aurangabad CAAQMS

Table No. 45: Data for Monthly average reading recorded at Aurangabad CAAQMS

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Aurangabad CAAQMS	2017	Apr	3	35	120
		May	6	33	96
		Jun	5	33	38
		Jul	4	44	37
		Aug	5	34	37
		Sep	4	32	43
		Oct	4	32	55
		Nov	5	44	83
		Dec	6	36	99
	2018	Jan	6	42	79
		Feb	5	38	79
		Mar	5	24	82

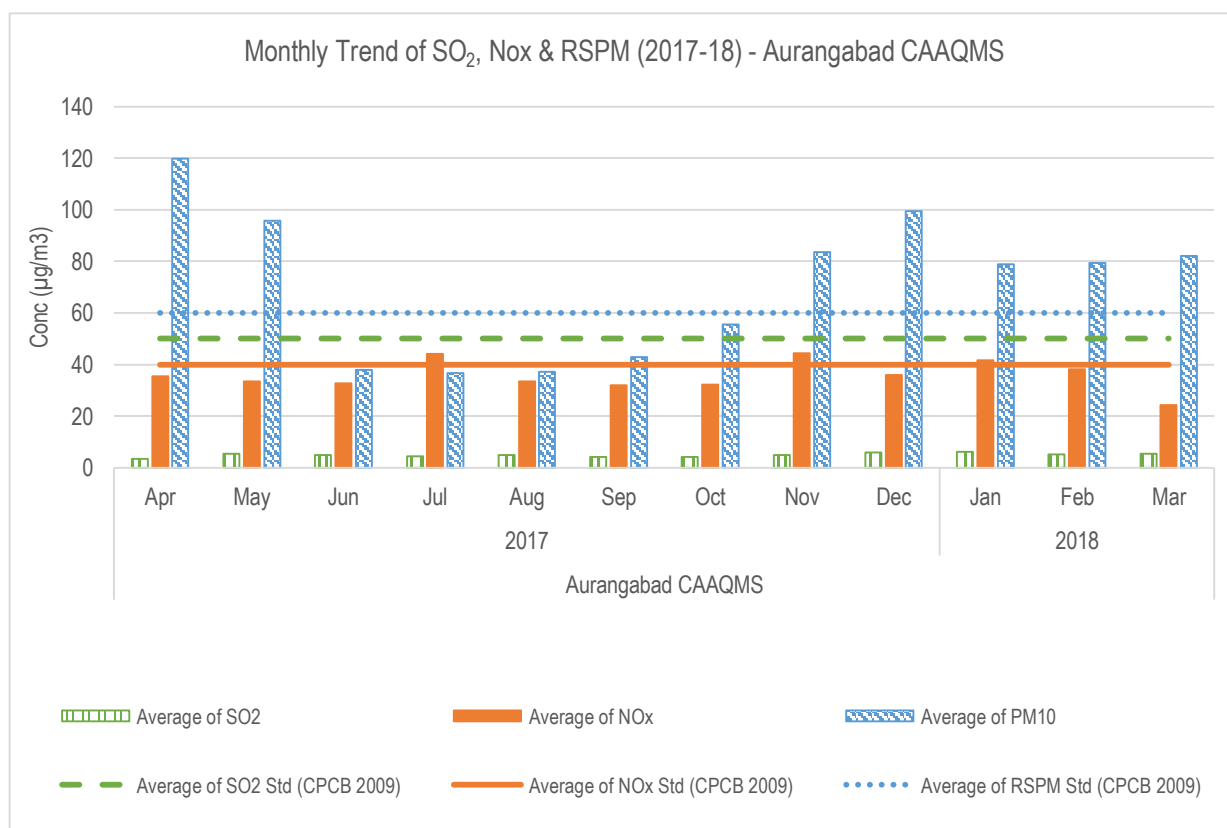
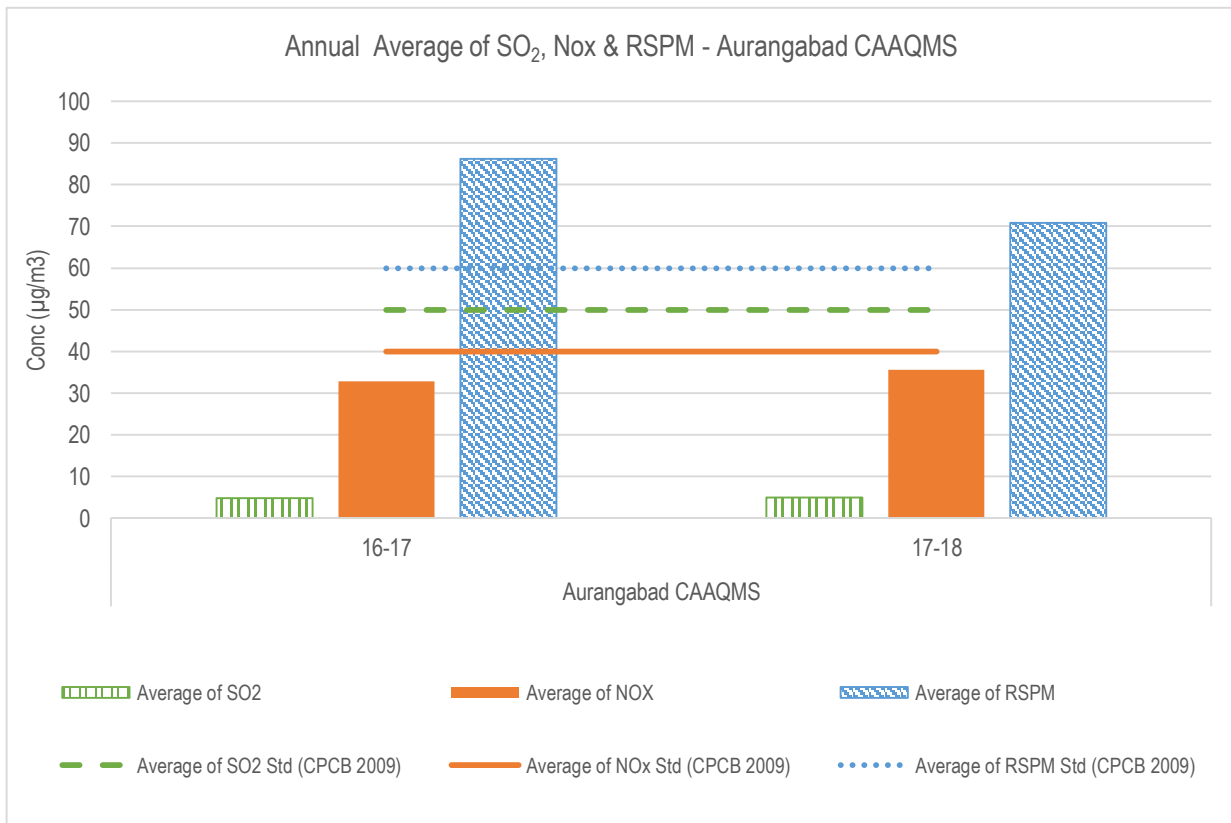


Figure No. 53: Monthly average reading recorded at Aurangabad CAAQMS

**Table No. 46: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Aurangabad CAAQMS**

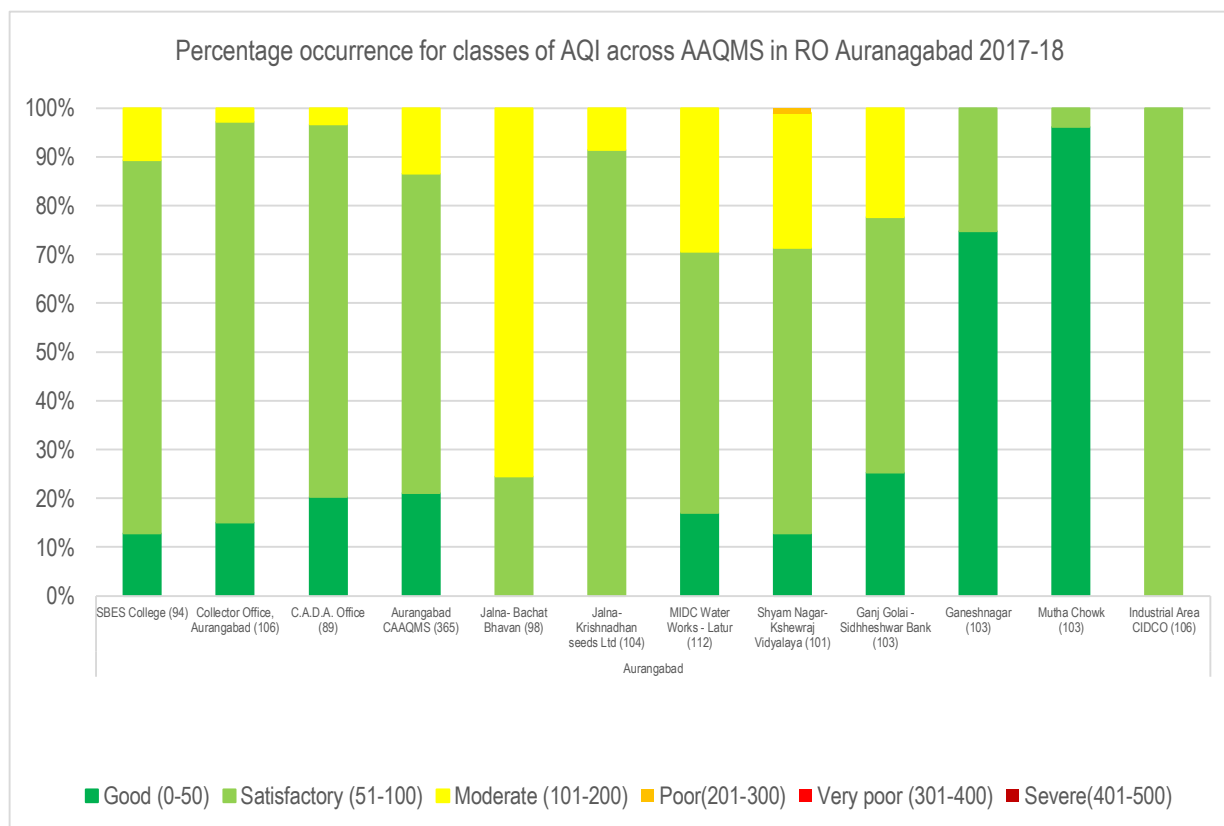
Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Aurangabad CAAQMS	16-17	5	33	86
	17-18	5	36	71



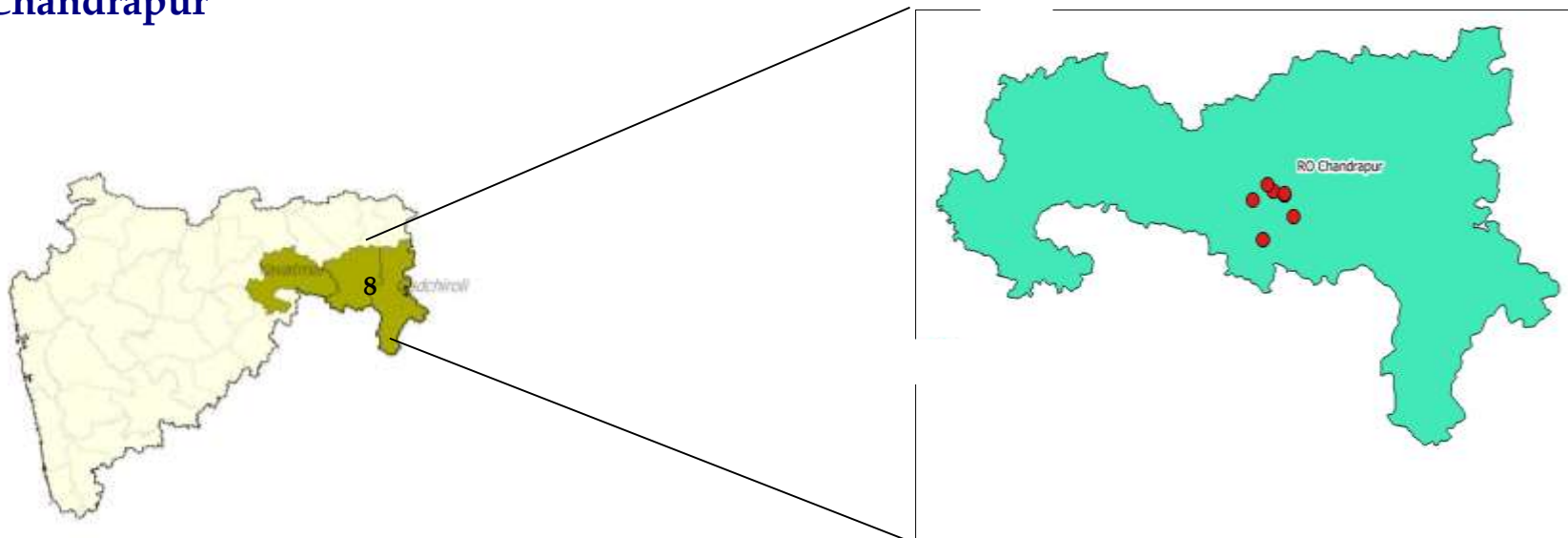
**Figure No. 54: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Aurangabad CAAQMS**

Table No. 47: Percentage exceedance of pollutants at Aurangabad RO

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
SBES College	94	0	0	10	0	0	11
Collector Office, Aurangabad	106	0	0	3	0	0	3
C.A.D.A. Office	89	0	0	3	0	0	3
Aurangabad CAAQMS	365	0	119	233	0	0	13
Jalna- Bachat Bhavan	98	0	0	74	0	0	76
Jalna- Krishnadhan seeds Ltd	104	0	0	9	0	0	9
MIDC Water Works - Latur	112	0	0	33	0	0	29
Shyam Nagar-Kshewraj Vidyalaya	101	0	0	29	0	0	29
Ganj Golai - Sidhsheshwar Bank	103	0	0	23	0	0	22
Ganeshnagar	103	0	0	0	0	0	0
Mutha Chowk	103	0	0	0	0	0	0
Industrial Area CIDCO	106	5	8	0	5	8	0



## RO – Chandrapur



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Chandrapur	Chandrapur	267	Ghuggus	Residential	19° 56' 23.0" N	79° 06' 50.9" E
	Chandrapur	281	Chandrapur - MIDC	Industrial	19° 58' 58.3" N	79° 13' 54.7" E
	Chandrapur	396	Chandrapur - SRO MPCB	Residential	19° 57' 55.9" N	79° 17' 59.1" E
	Chandrapur	638	Tadali MIDC	Industrial	20° 00' 59.6" N	79° 11' 51.5" E
	Chandrapur	639	Ballarshah	Residential	19° 51' 11.8" N	79° 20' 55.7" E
	Chandrapur	640	Rajura	Industrial	19° 44' 11.7" N	79° 10' 29.5" E
	Chandrapur		Chandrapur CAAQMS	Industrial	19° 57' 44.67"N	79° 17' 57.81"E
	Chandrapur		Civil lines,Chandrapur	Commercial	19° 58' 13.66"N	79° 18' 05.34"E

## Chandrapur - Ghuggus

Table No. 48: Data for Monthly average reading recorded at Ghuggus - Chandrapur

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Ghuggus	2017	Apr	4	22	335
		May	4	28	293
		Jun	4	9	193
		Jul	4	33	163
		Aug	4	21	201
		Sep	5	26	242
		Oct	4	29	119
		Nov	4	32	339
		Dec	4	26	417
	2018	Jan	4	25	433
		Feb	5	31	438
		Mar	4	28	496

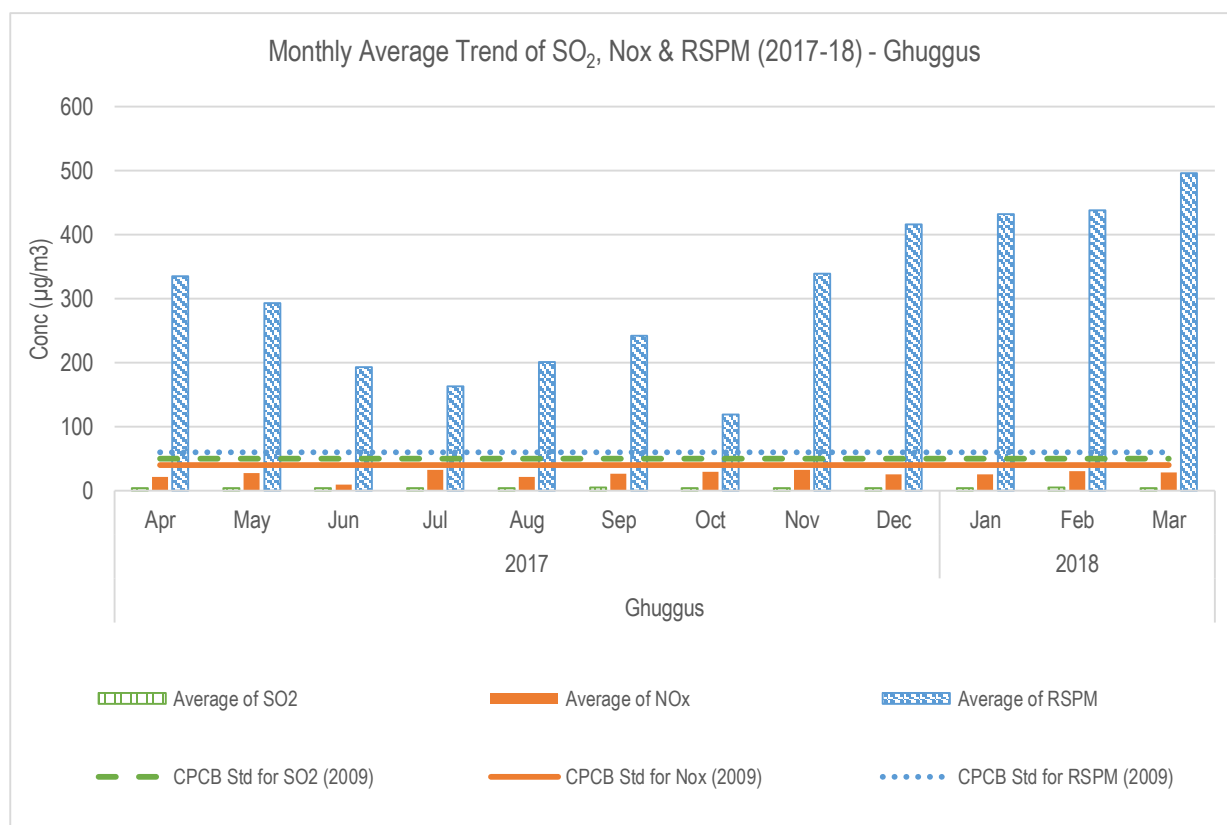


Figure No. 55: Monthly average reading recorded at Ghuggus - Chandrapur

Table No. 49: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ghuggus - Chandrapur

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Ghuggus	04-05	18	28	80
	05-06	21	31	131
	06-07	31	39	139
	07-08	36	53	186
	08-09	34	54	172
	09-10	46	32	180
	10-11	23	24	211
	11-12	18	21	206
	12-13	11	13	207
	13-14	9	19	174
	14-15	9	14	140
	15-16	4	17	180
	16-17	4	25	242
	17-18	4	26	298

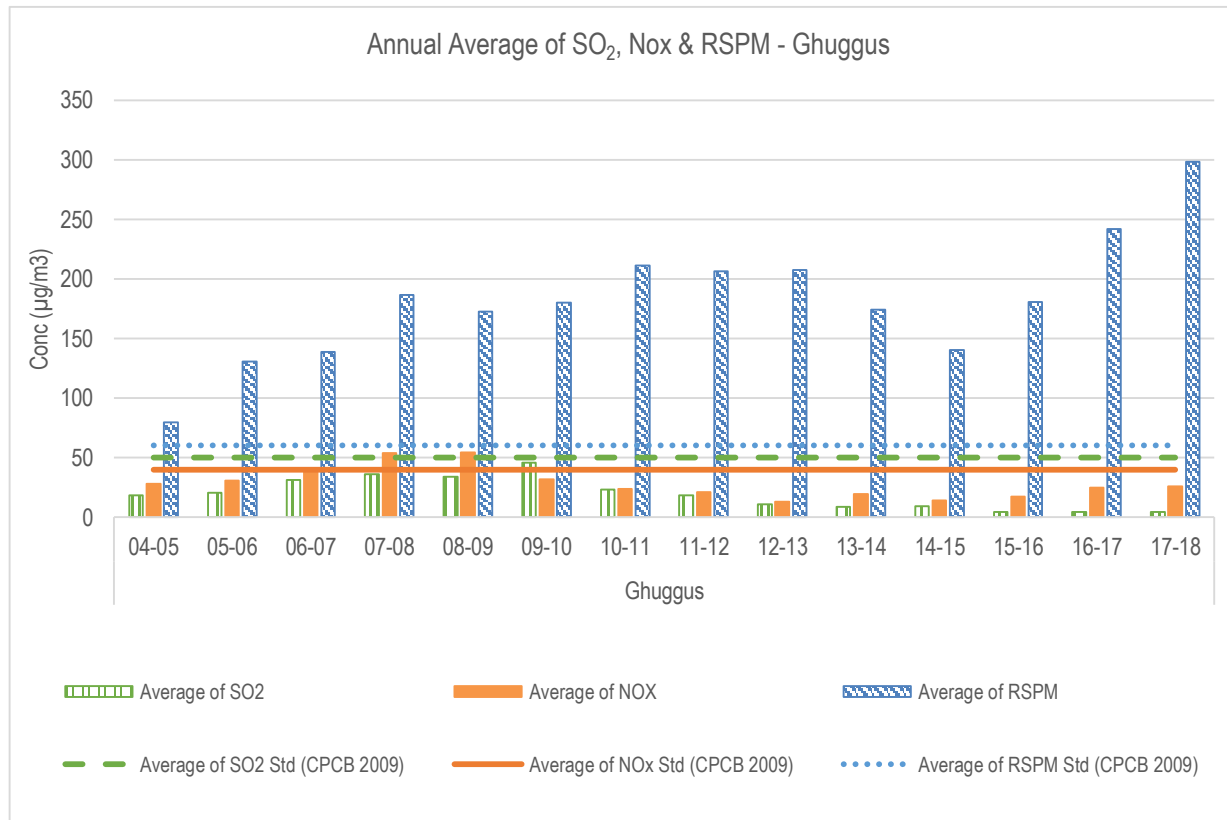


Figure No. 56: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ghuggus - Chandrapur



## Chandrapur - Chandrapur - MIDC

Table No. 50: Data for Monthly average reading recorded at Chandrapur - MIDC

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Chandrapur - MIDC	2017	Apr	4	23	80
		May	4	31	69
		Jun	4	12	55
		Jul	4	34	91
		Aug	4	25	42
		Sep	4	28	50
		Oct	4	30	55
		Nov	4	32	95
		Dec	4	31	112
	2018	Jan	5	21	72
		Feb	5	32	83
		Mar	5	34	87

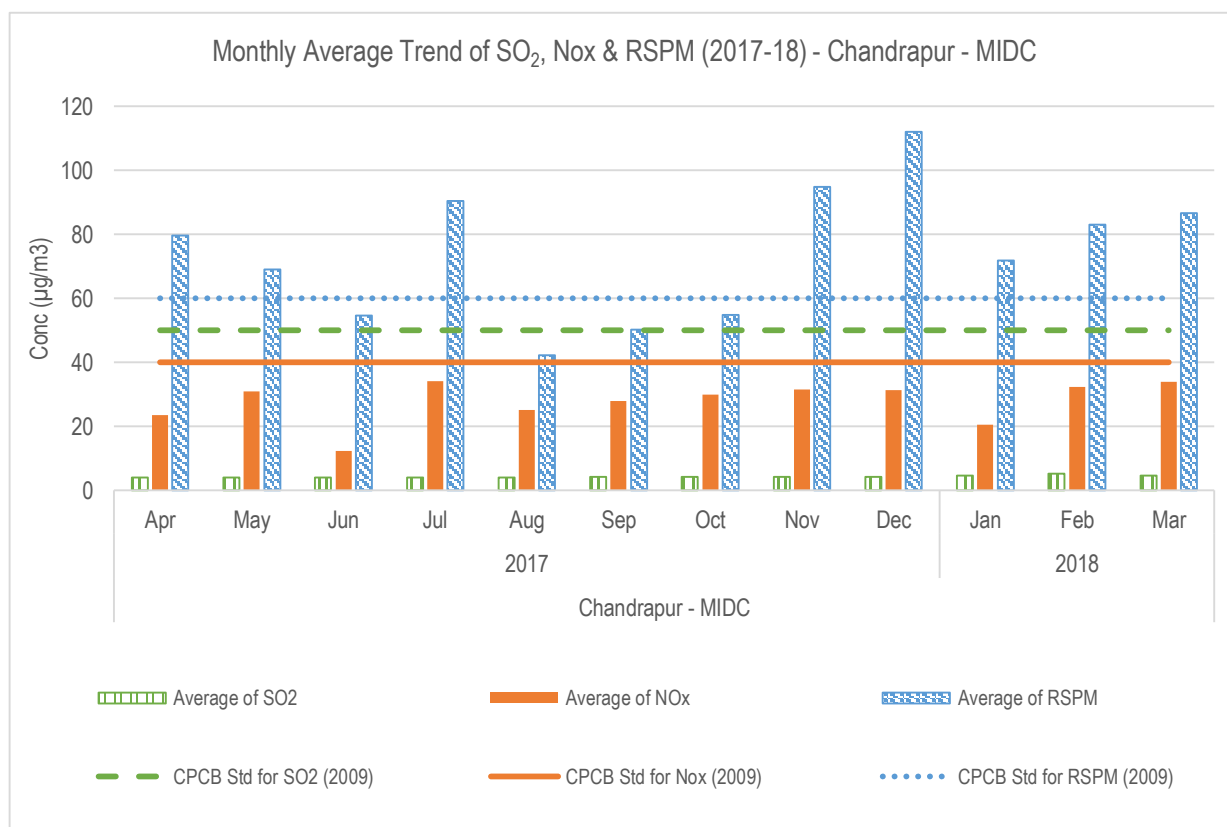
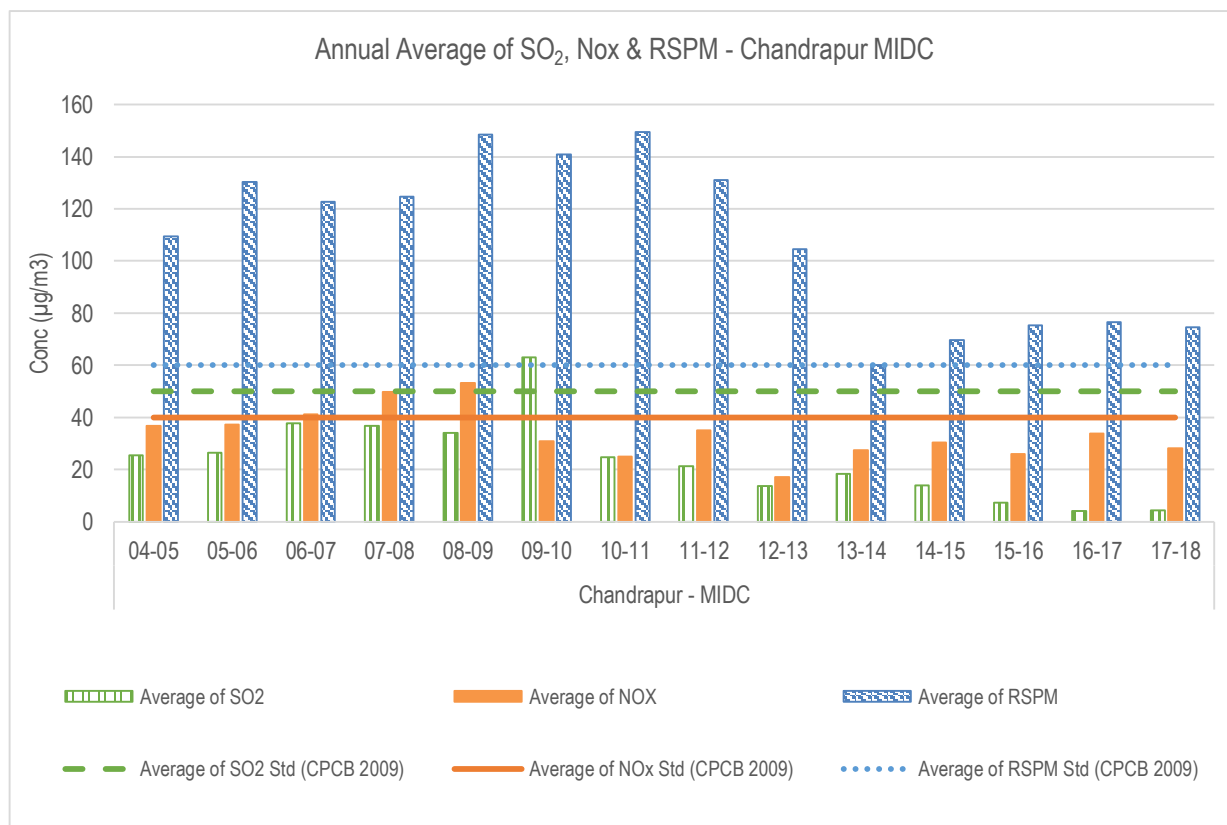


Figure No. 57: Monthly average reading recorded at Chandrapur – MIDC

**Table No. 51: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Chandrapur - MIDC**

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Chandrapur - MIDC	04-05	25	37	110
	05-06	26	37	130
	06-07	38	41	123
	07-08	37	50	125
	08-09	34	53	148
	09-10	63	31	141
	10-11	25	25	150
	11-12	21	35	131
	12-13	14	17	105
	13-14	18	27	60
	14-15	14	30	70
	15-16	7	26	75
	16-17	4	34	77
	17-18	4	28	74



**Figure No. 58: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Chandrapur – MIDC**

## Chandrapur - Chandrapur- SRO MPCB

Table No. 52: Data for Monthly average reading recorded at Chandrapur- SRO MPCB

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Chandrapur - SRO MPCB	2017	Apr	4	31	123
		May	4	33	88
		Jun	4	28	66
		Jul	4	33	59
		Aug	4	22	60
		Sep	4	26	61
		Oct	4	31	110
		Nov	4	33	91
		Dec	4	32	108
	2018	Jan	4	24	109
		Feb	5	29	90
		Mar	4	33	127

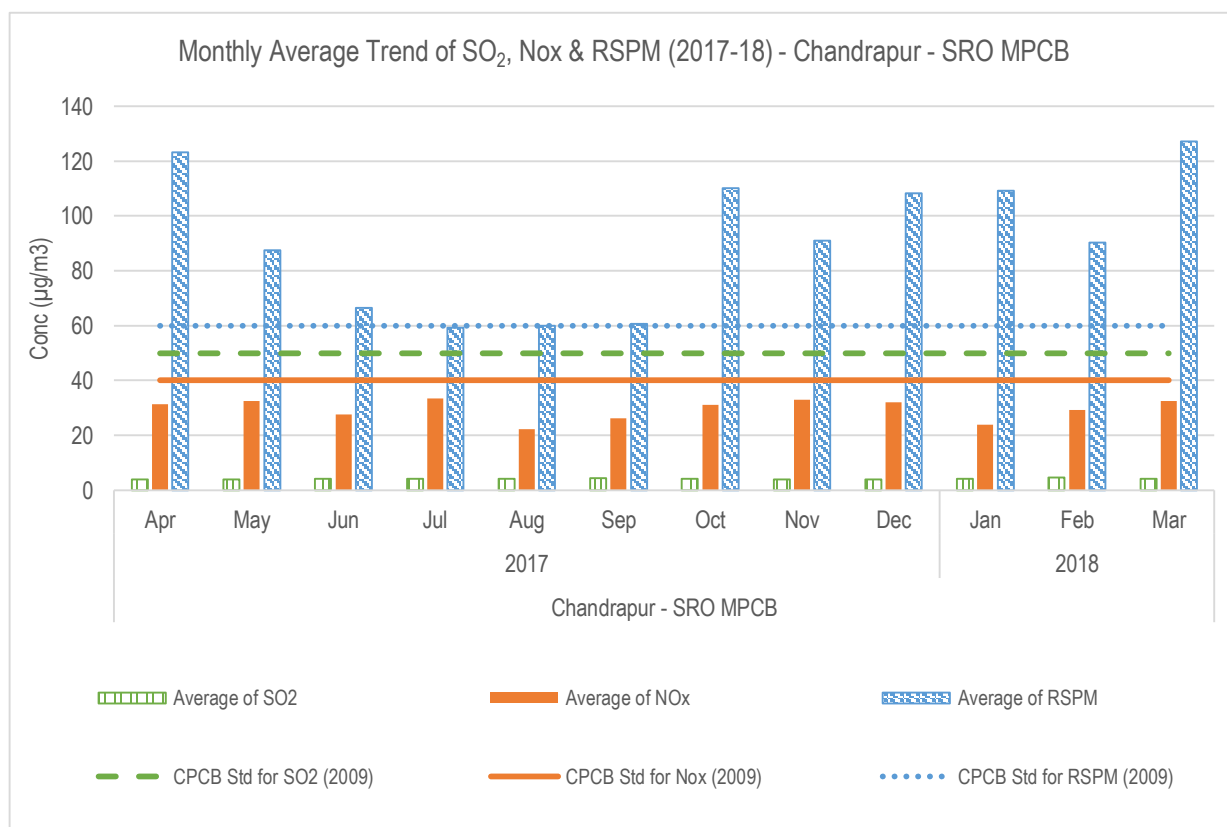
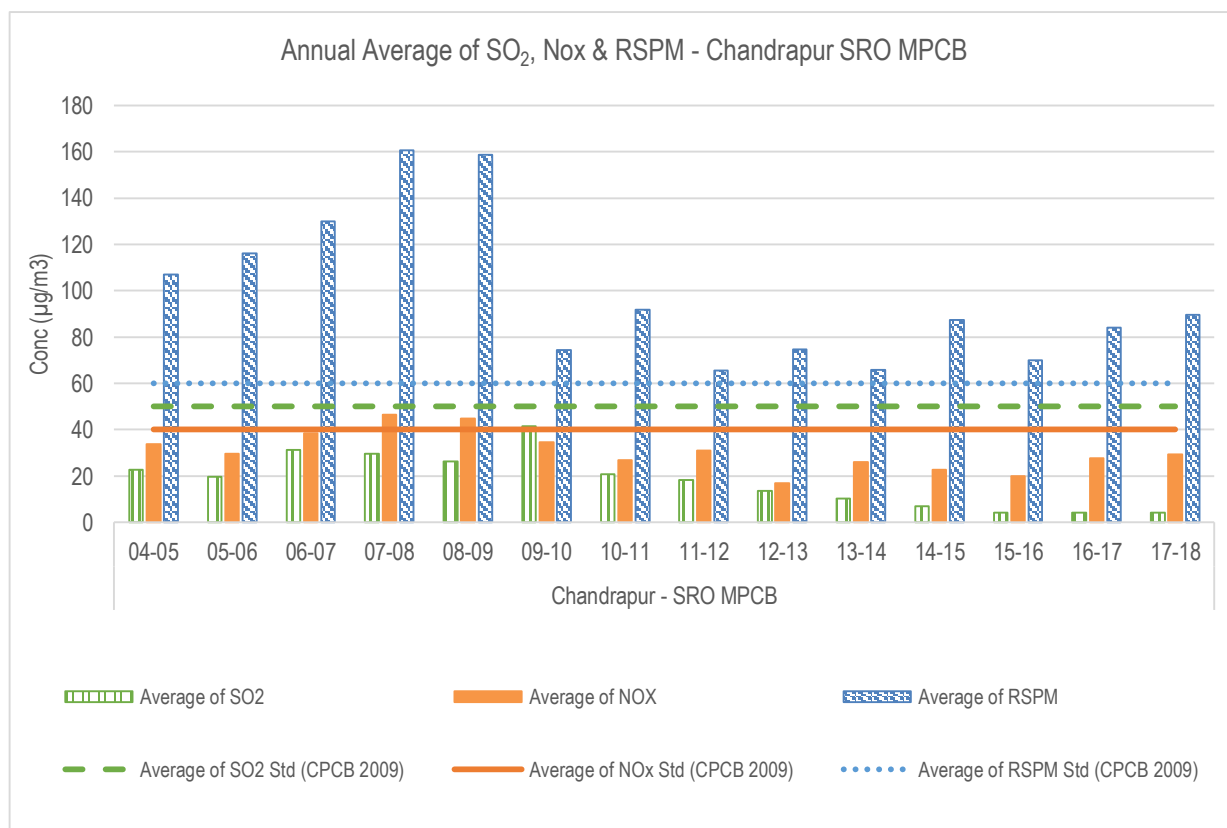


Figure No. 59: Monthly average reading recorded at Chandrapur- SRO MPCB

**Table No. 53: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Chandrapur - SRO MPCB**

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Chandrapur - SRO MPCB	04-05	23	34	107
	05-06	20	30	116
	06-07	31	38	130
	07-08	30	46	161
	08-09	26	45	159
	09-10	41	35	74
	10-11	21	27	92
	11-12	18	31	66
	12-13	14	17	75
	13-14	10	26	66
	14-15	7	23	87
	15-16	4	20	70
	16-17	4	28	84
	17-18	4	29	90



**Figure No. 60: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Chandrapur - SRO MPCB**

## Chandrapur - Tadali MIDC

Table No. 54: Data for Monthly average reading recorded at Tadali MIDC

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Tadali MIDC	2017	Apr	4	22	129
		May	4	27	190
		Jun	4	21	71
		Jul	4	33	163
		Aug	4	23	70
		Sep	4	26	80
		Oct	4	31	124
		Nov	4	32	105
		Dec	4	25	123
	2018	Jan	4	21	90
		Feb	5	32	85
		Mar	4	32	67

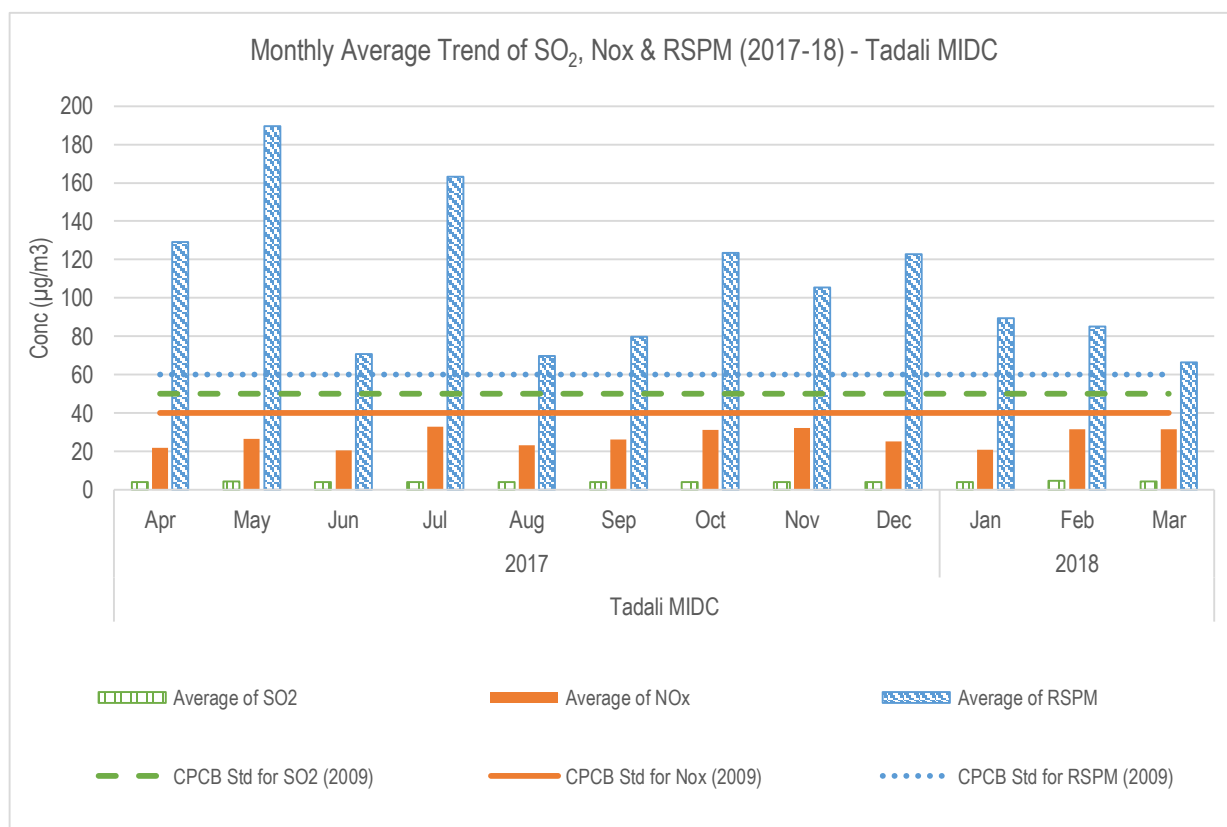
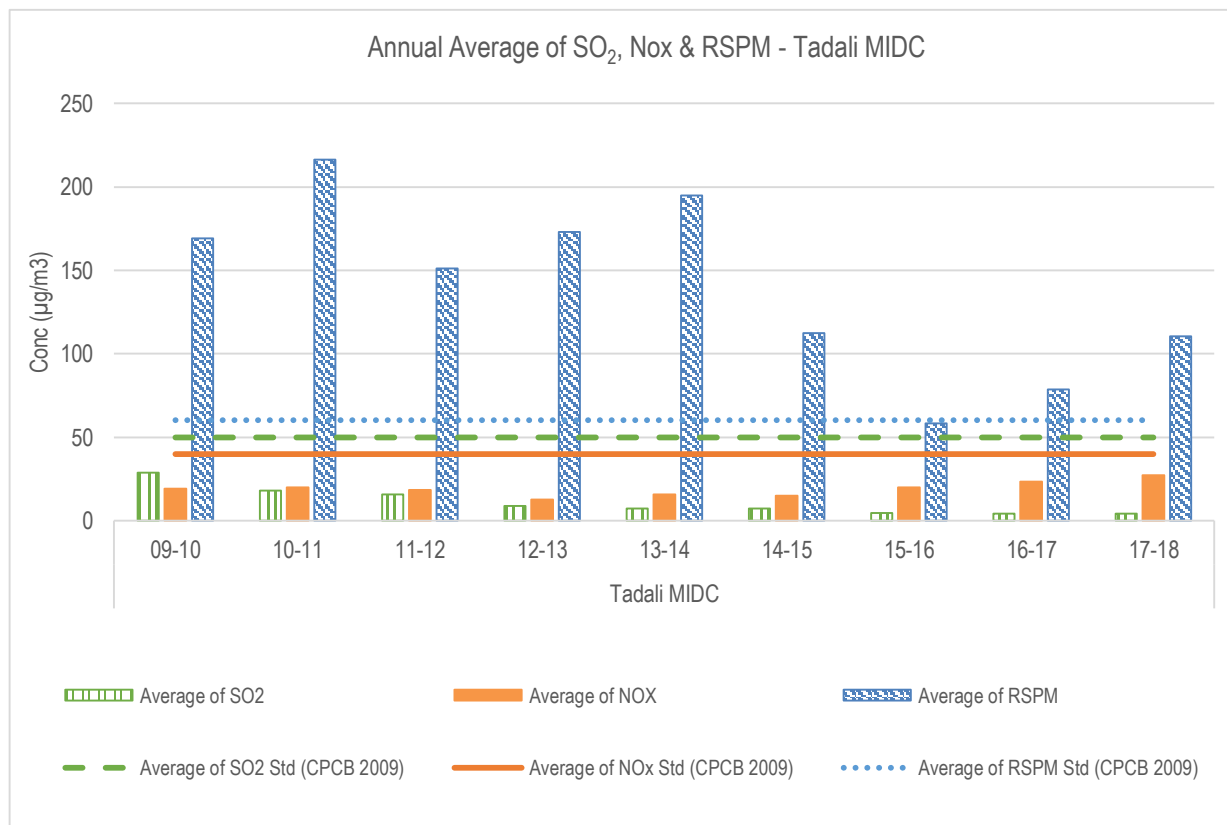


Figure No. 61: Monthly average reading recorded at Tadali MIDC

**Table No. 55: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Tadali MIDC**

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Tadali MIDC	09-10	29	19	169
	10-11	18	20	216
	11-12	16	18	151
	12-13	9	13	173
	13-14	7	16	195
	14-15	7	15	112
	15-16	4	20	58
	16-17	4	23	79
	17-18	4	27	110



**Figure No. 62: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Tadali MIDC**

## Chandrapur - Ballarshah

Table No. 56: Data for Monthly average reading recorded at Ballarshah

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Ballarshah	2017	Apr	4	24	160
		May	4	34	150
		Jun	4	17	93
		Jul	4	34	121
		Aug	4	25	104
		Sep	4	28	94
		Oct	4	29	99
		Nov	4	34	176
		Dec	4	29	171
	2018	Jan	5	24	133
		Feb	5	35	138
		Mar	4	33	147

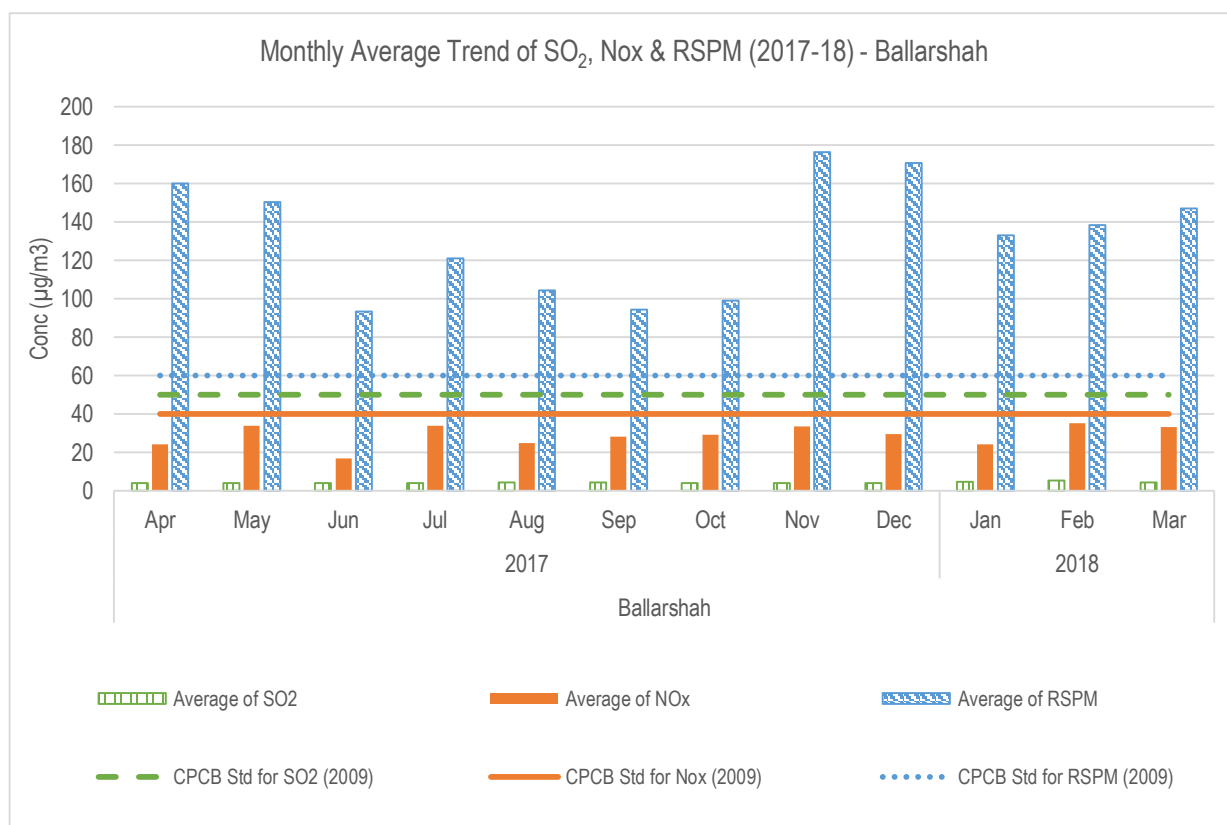
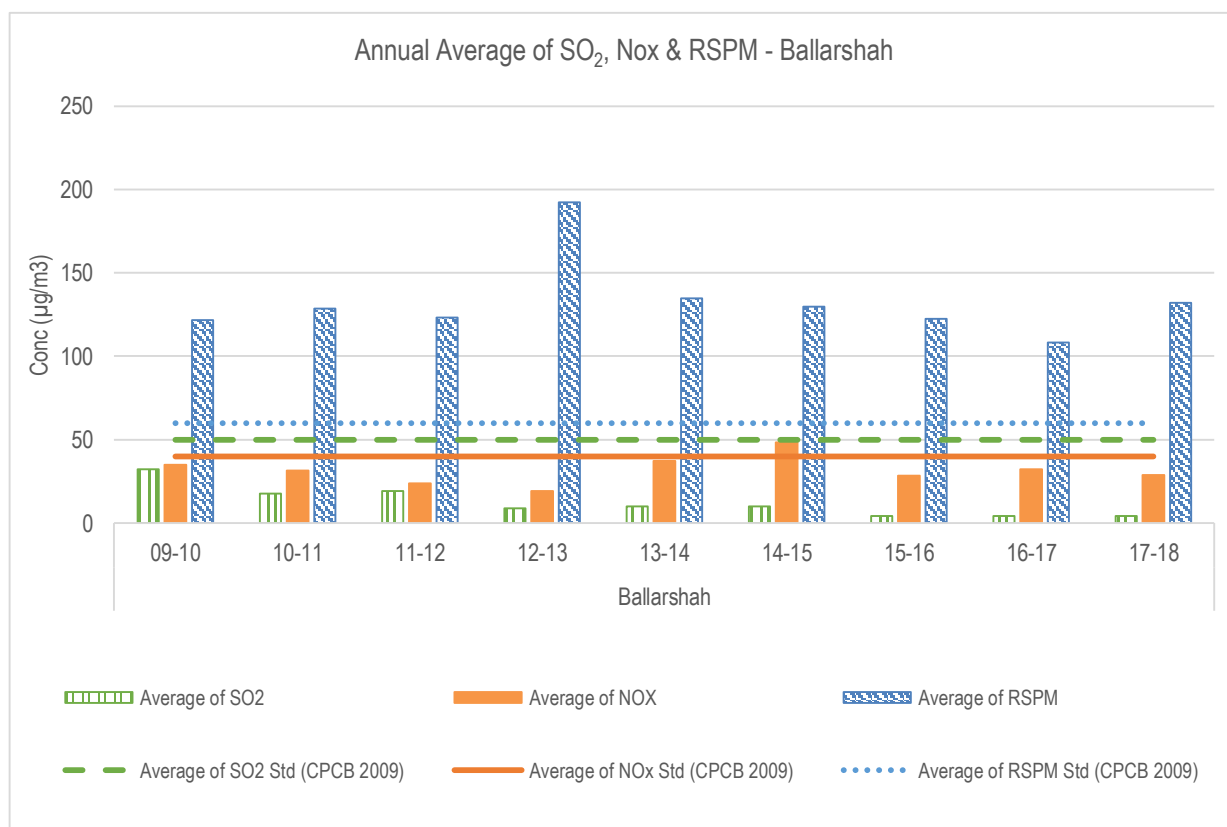


Figure No. 63: Monthly average reading recorded at Ballarshah

Table No. 57: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ballarshah

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Ballarshah	09-10	32	35	122
	10-11	17	32	129
	11-12	19	24	123
	12-13	9	19	192
	13-14	10	37	135
	14-15	10	48	130
	15-16	4	28	123
	16-17	4	32	108
	17-18	4	29	132

Figure No. 64: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ballarshah



## Chandrapur - Rajura

Table No. 58: Data for Monthly average reading recorded at Rajura

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Rajura	2017	Apr	4	24	206
		May	4	34	282
		Jun	4	10	112
		Jul	4	34	158
		Aug	4	23	177
		Sep	4	28	140
		Oct	4	31	129
		Nov	4	32	164
		Dec	4	26	222
	2018	Jan	4	26	199
		Feb	5	24	233
		Mar	4	26	196

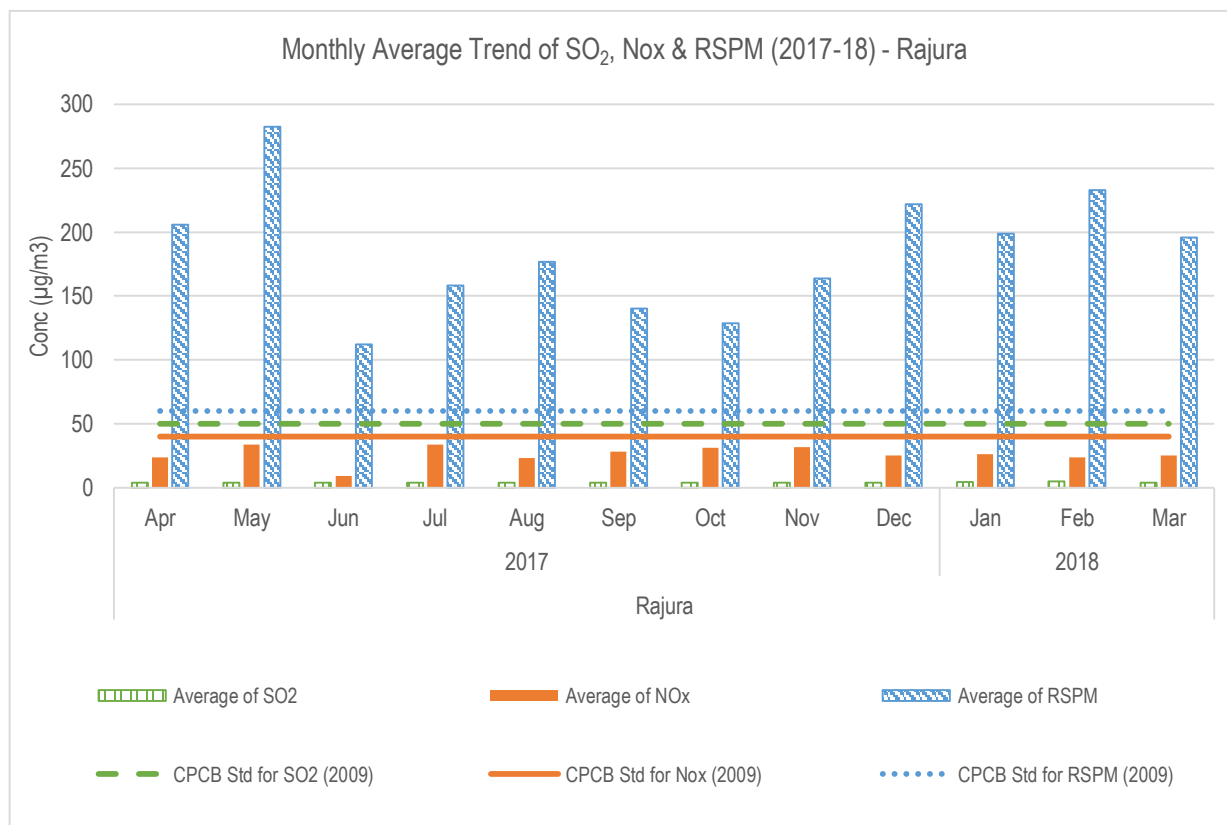
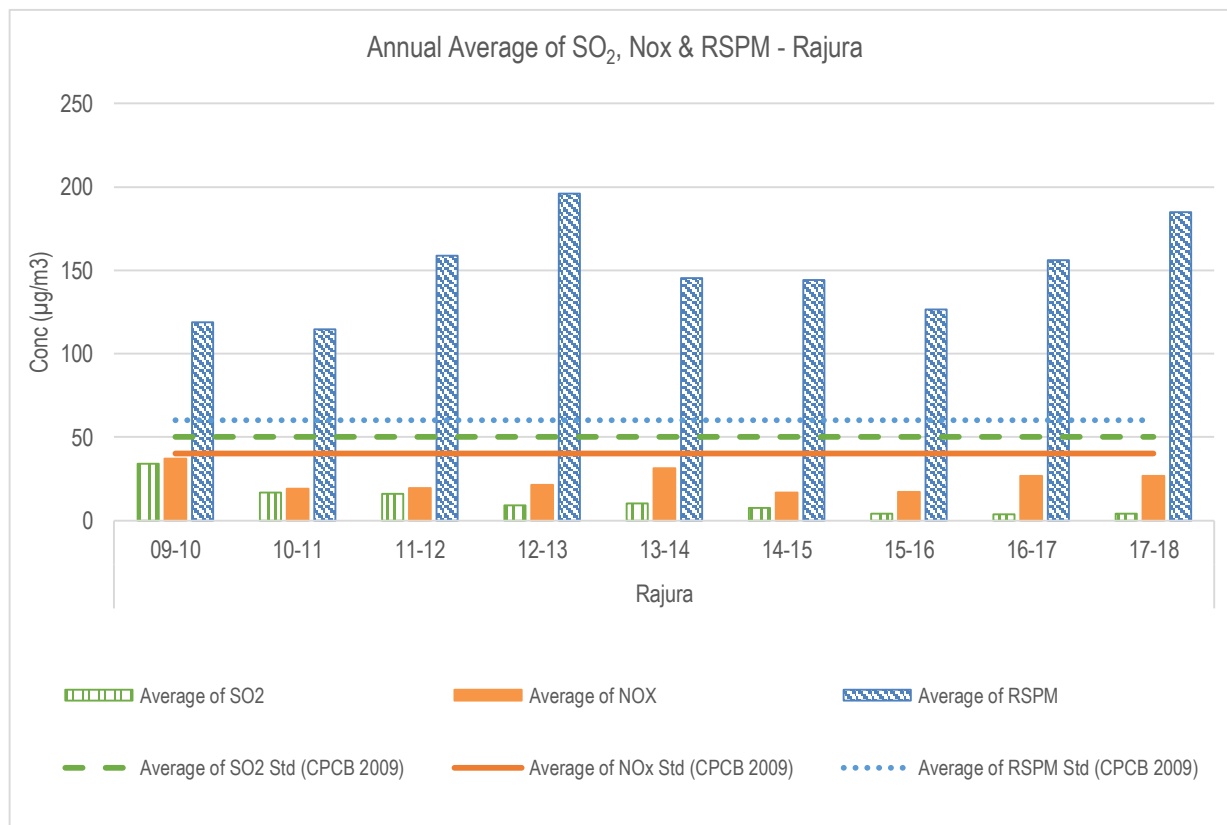


Figure No. 65: Monthly average reading recorded at Rajura

**Table No. 59: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Rajura**

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Rajura	09-10	34	37	119
	10-11	17	19	115
	11-12	16	19	159
	12-13	9	21	196
	13-14	10	31	145
	14-15	7	17	144
	15-16	4	17	127
	16-17	4	27	156
	17-18	4	27	185



**Figure No. 66: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Rajura**

## Chandrapur - Chandrapur CAAQMS

Table No. 60: Data for Monthly average reading recorded at Chandrapur CAAQMS

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Chandrapur CAAQMS	2017	Apr	21	9	115
		May	5	7	74
		Jun	4	4	38
		Jul	4	7	30
		Aug	10	13	21
		Sep	11	11	48
		Oct	10	6	62
		Nov	16	144	112
		Dec	5	24	70
	2018	Jan	2	16	83
		Feb	2	15	80
		Mar	2	10	88

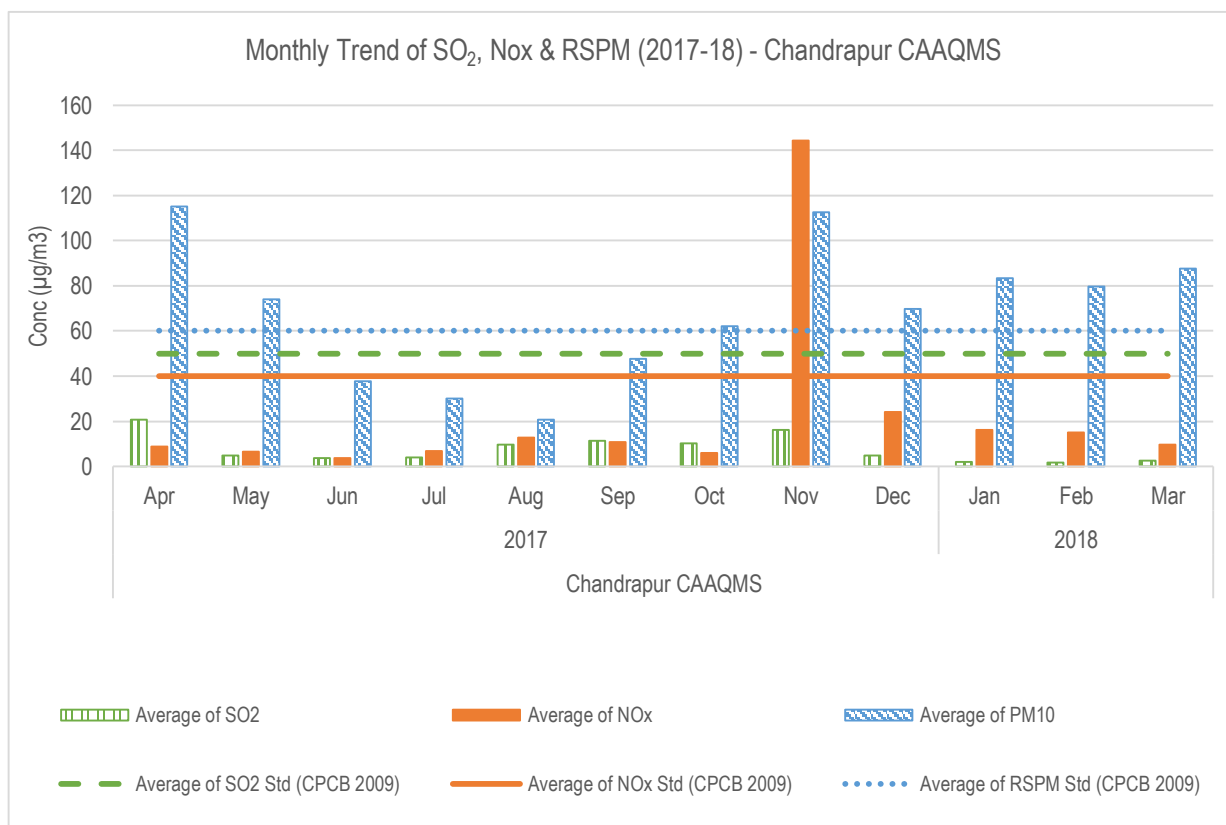
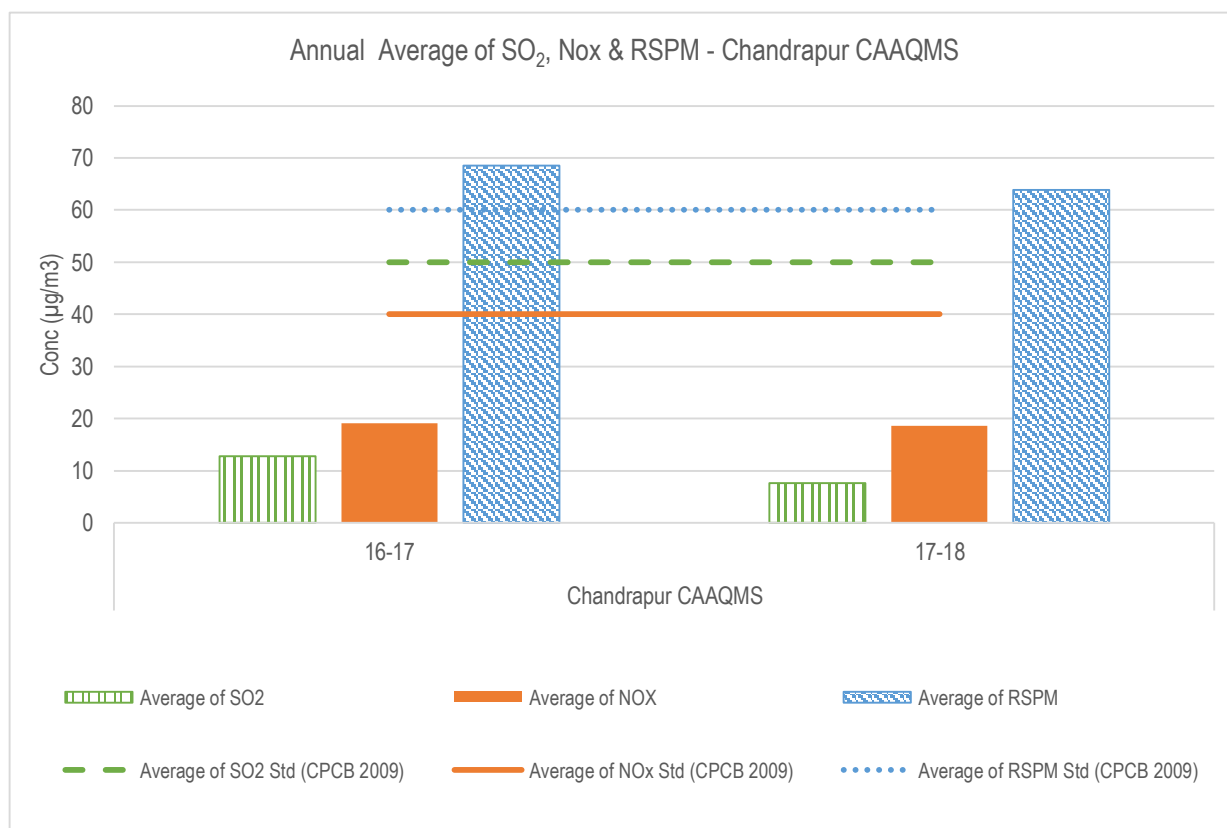


Figure No. 67: Monthly average reading recorded at Chandrapur CAAQMS

**Table No. 61: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Chandrapur CAAQMS**

Station Name	Year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Chandrapur CAAQMS	16-17	13	19	69
	17-18	8	19	64



**Figure No. 68: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Chandrapur CAAQMS**

## Chandrapur - Civil Lines

Table No. 62: Data for Monthly average reading recorded at Civil Lines Chandrapur

\*The station is installed in current year 2017-18

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Civil Lines, Chandrapur	2017	Apr	12	33	197
		May	12	25	165
		Jun	9	21	74
		Jul	9	26	56
		Aug	9	24	58
		Sep	9	24	75
		Oct	9	24	116
		Nov	9	24	134
		Dec	10	25	164
	2018	Jan	11	26	154
		Feb	10	25	133
		Mar	10	25	176

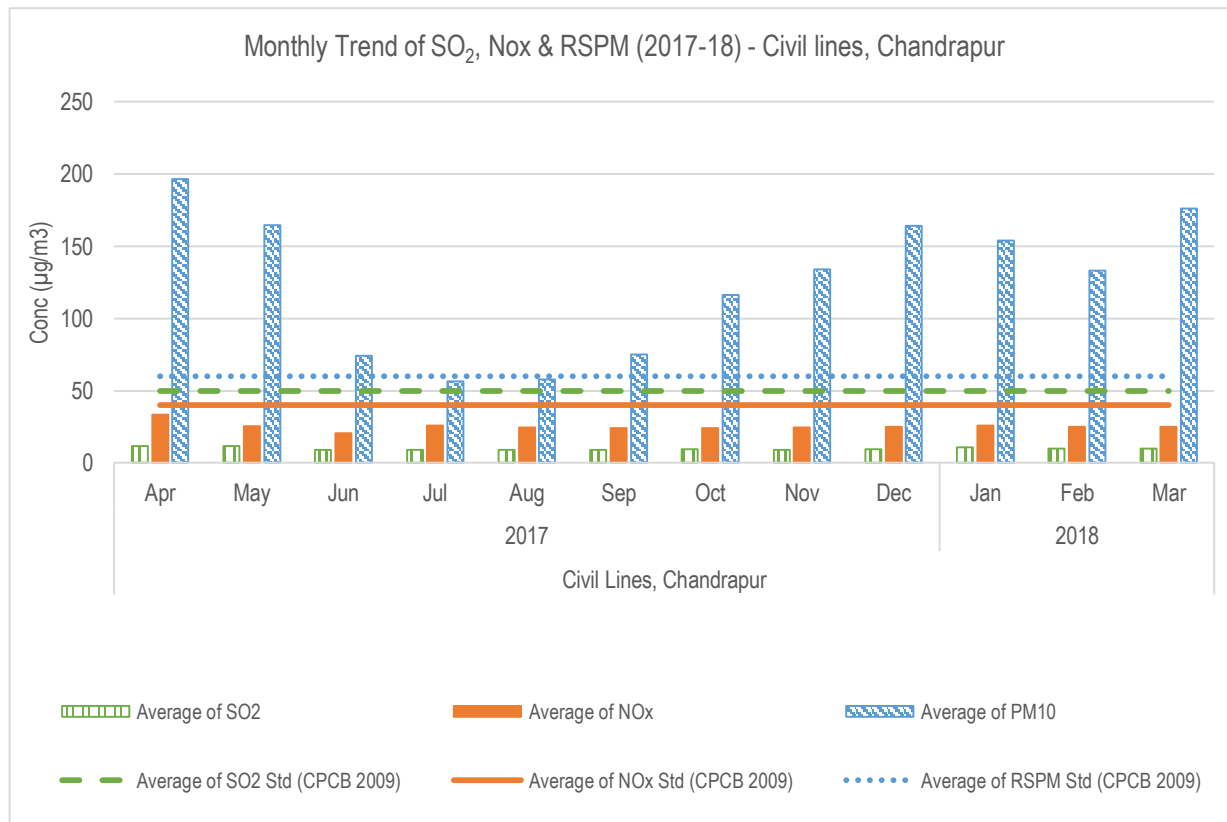
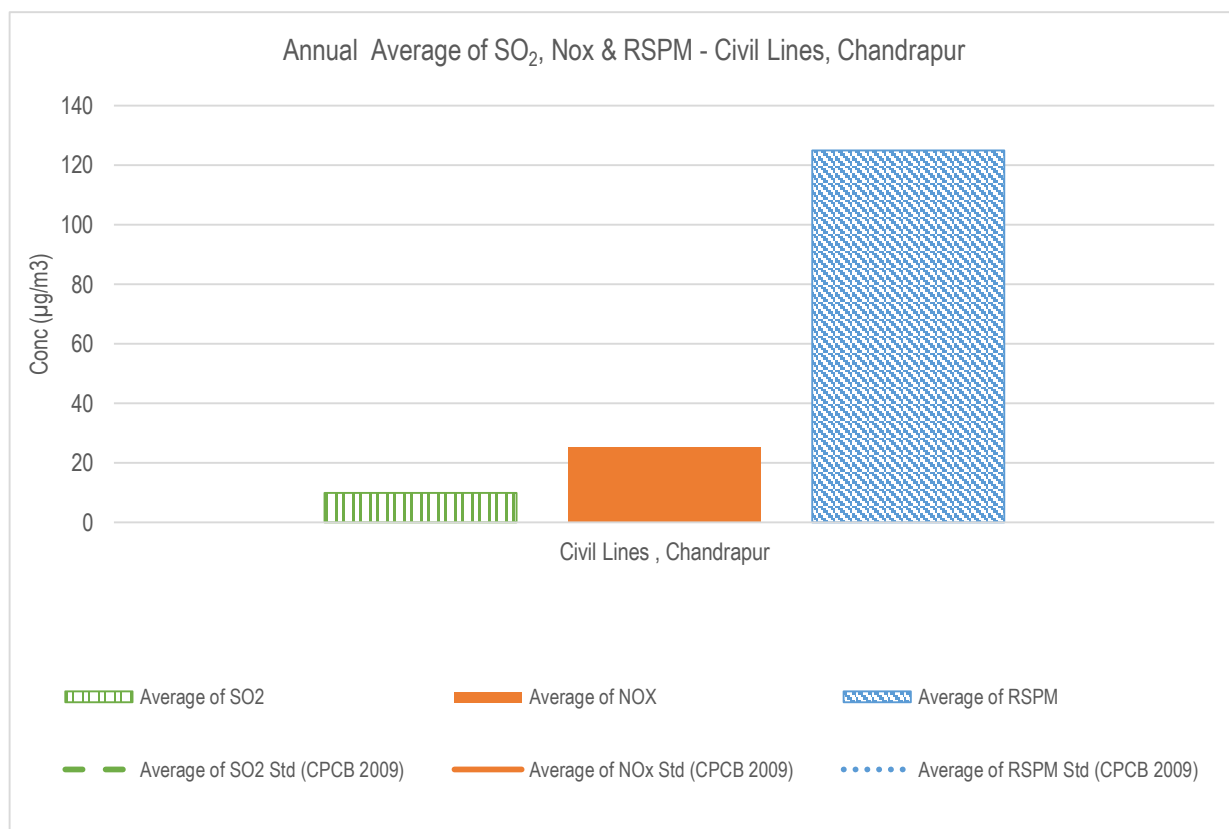


Figure No. 69: Monthly average reading recorded at Civil Lines Chandrapur

**Table No. 63: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Civil Lines Chandrapur**  
 \*The station is installed in current year 2017-18

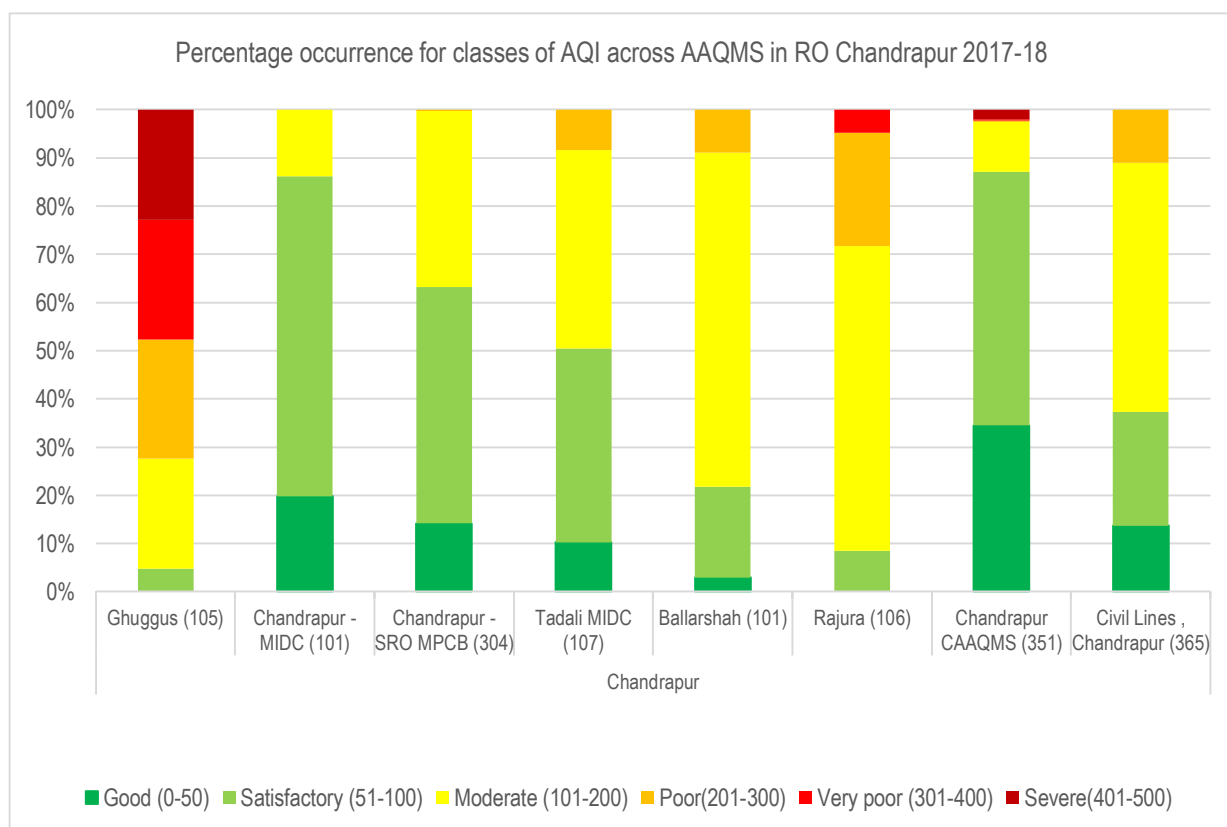
Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Civil Lines , Chandrapur	17-18	10	25	125



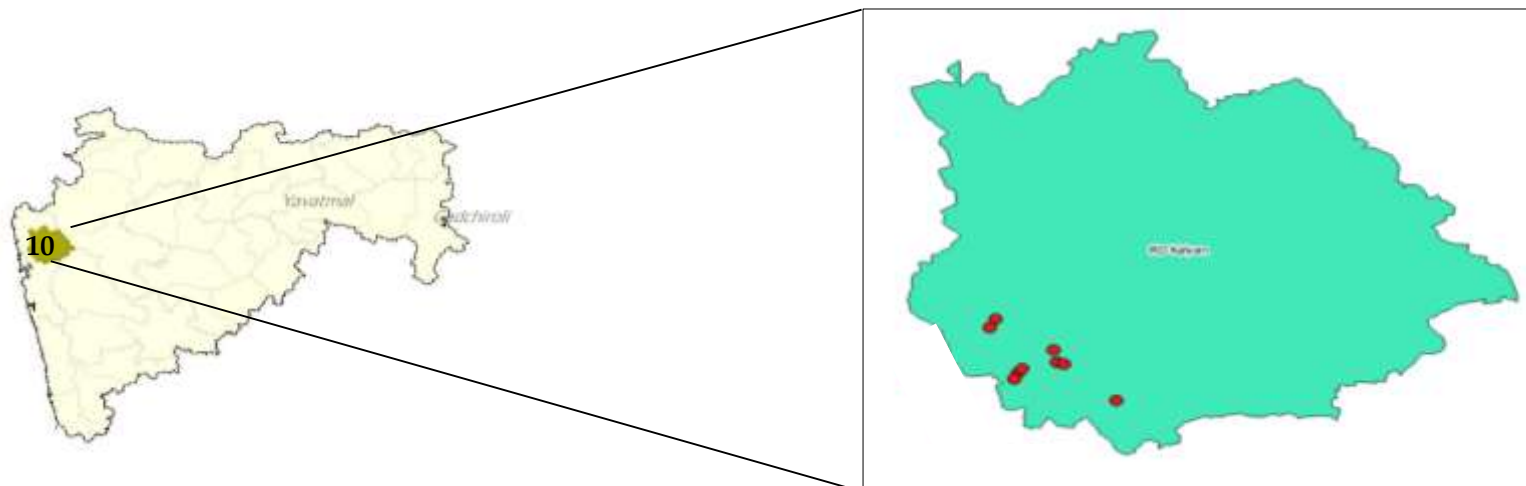
**Figure No. 70: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Civil Lines Chandrapur**

Table No. 64: Percentage exceedance of pollutants at Chandrapur RO

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Ghuggus	105	0	0	100	0	0	95
Chandrapur - MIDC	101	0	0	14	0	0	14
Chandrapur - SRO MPCB	304	0	0	112	0	0	37
Tadali MIDC	107	0	0	53	0	0	50
Ballarshah	101	0	0	79	0	0	78
Rajura	106	0	0	97	0	0	92
Chandrapur CAAQMS	351	6	10	193	0	1	39
Civil Lines , Chandrapur	365	0	0	229	0	0	2



## RO - Kalyan



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Kalyan	Ambernath	445	Ambernath	Rural and other areas	19° 13' 26.2" N	73° 09' 15.0" E
	Badlapur	649	Badlapur - BIWA House	Rural and other areas	19° 09' 22.2" N	73° 14' 16.0" E
	Bhiwandi		I.G.M. Hospital	Rural and other areas	19° 17' 57.2" N	73° 04' 00.4" E
	Bhiwandi		Prematai hall	Commercial	19° 17' 07.7" N	73° 03' 27.8" E
	Dombivali	265	Dombivali	Industrial	19° 12' 15.8" N	73° 05' 53.9" E
	Dombivali		MIDC Office Dombivali	Industrial	19° 12' 47.0" N	73° 06' 17.4" E
	Dombivali		Dombivali CAAQMS	Industrial	19° 11' 38.38"N	73° 05' 32.35"E
	Kalyan		MPCB RO Kalyan office	Commercial	19° 14' 42.0" N	73° 08' 58.6" E
	Ulhasnagar	647	Smt. CHM College Campus	Rural and other areas	19° 13' 12.4" N	73° 09' 51.3" E
	Ulhasnagar	648	Powai Chowk	Rural and other areas	19° 13' 26.0" N	73° 09' 16.2" E



## Ambernath

Table No. 65: Data for Monthly average reading recorded at Ambernath

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Ambernath	2017	Apr	19	59	106
		May	25	82	136
		Jun	29	64	125
		Jul	24	69	128
		Aug	29	73	216
		Sep	21	59	202
		Oct	20	81	306
		Nov	21	59	202
		Dec	20	81	306
	2018	Jan	24	79	564
		Feb	24	79	564
		Mar	28	74	273

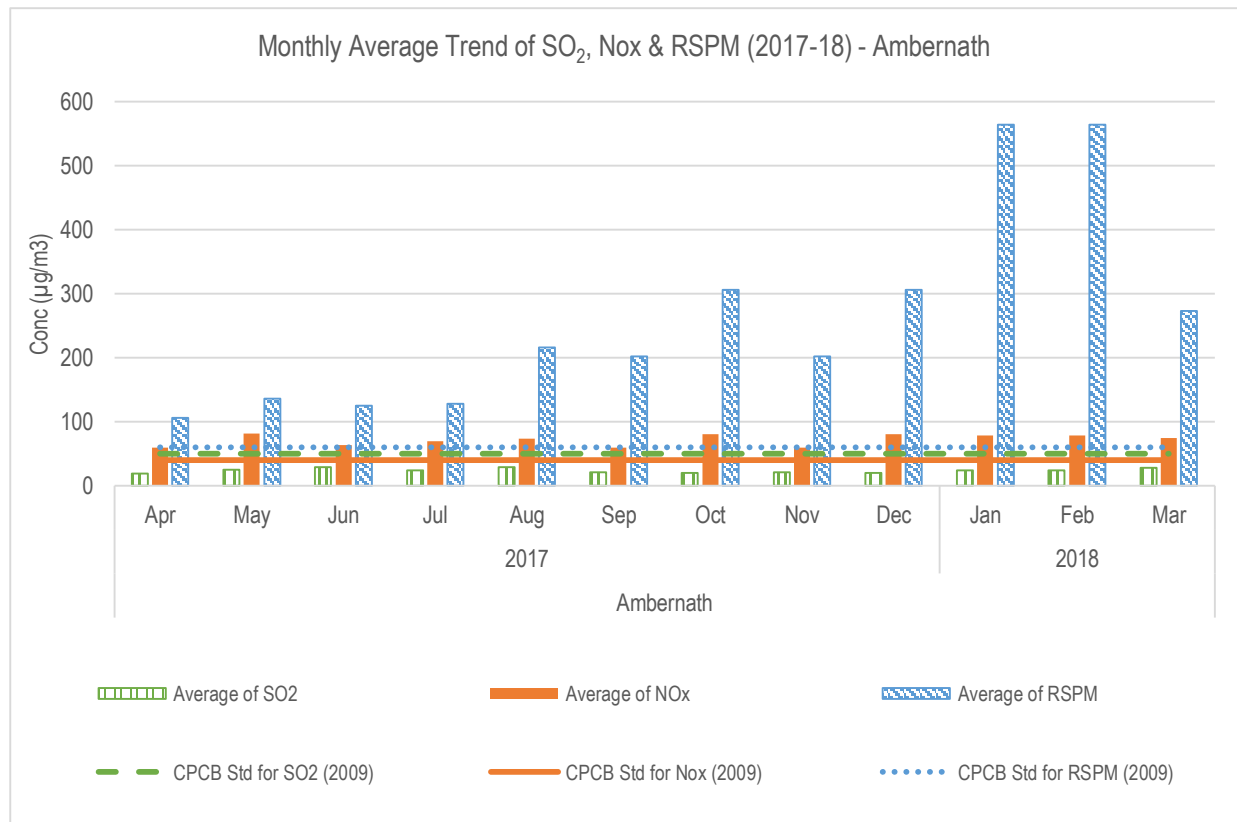
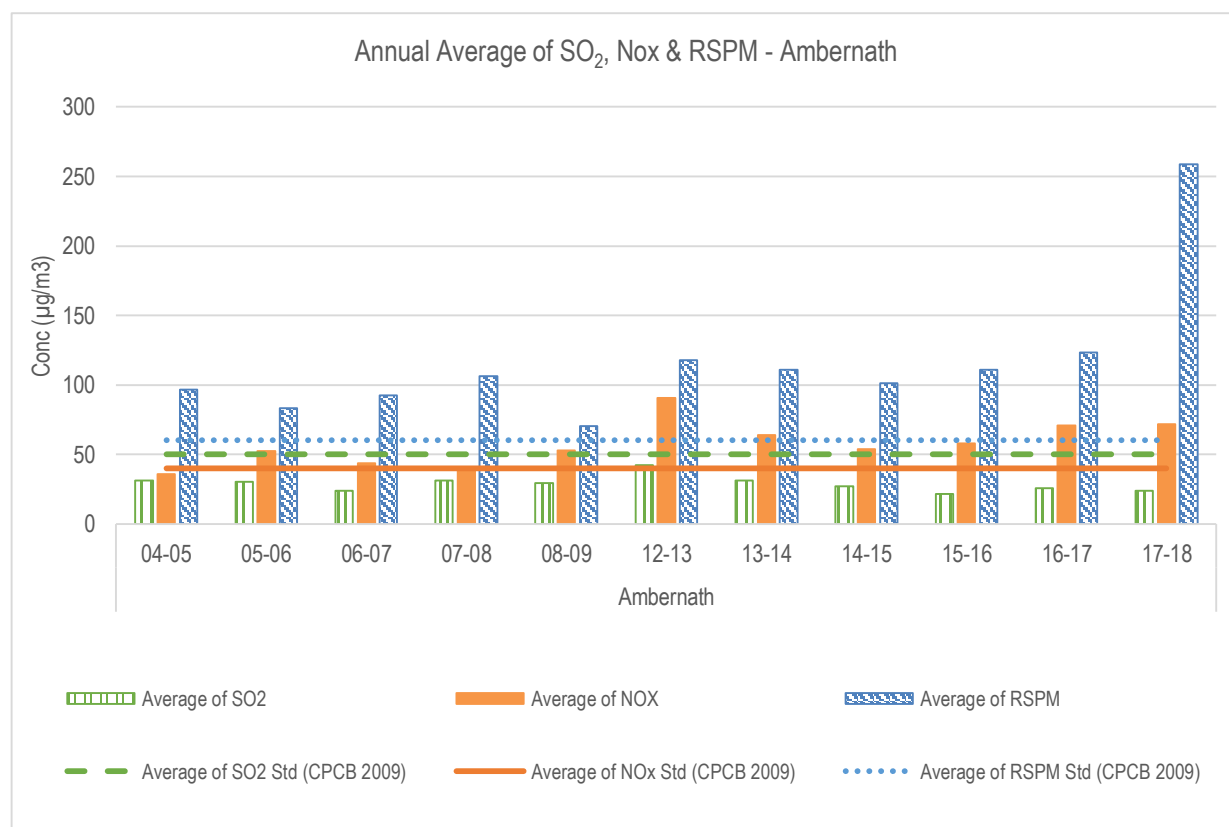


Figure No. 71: Monthly average reading recorded at Ambernath

Table No. 66: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ambernath

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Ambernath	04-05	31	36	97
	05-06	30	52	83
	06-07	24	44	93
	07-08	31	40	106
	08-09	29	53	70
	12-13	42	91	118
	13-14	31	64	111
	14-15	27	54	101
	15-16	22	58	111
	16-17	26	71	123
	17-18	24	72	259

Figure No. 72: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ambernath

## Badlapur - Badlapur - BIWA House

Table No. 67: Data for Monthly average reading recorded at Badlapur - BIWA House

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Badlapur - BIWA House	2017	Apr	18	57	107
		May	34	107	190
		Jun	29	62	120
		Jul	25	74	136
		Aug	29	70	307
		Sep	19	56	111
		Oct	70	65	207
		Nov	29	70	328
		Dec	70	65	207
	2018	Jan	24	80	412
		Feb	24	80	412
Mar		20	75	190	

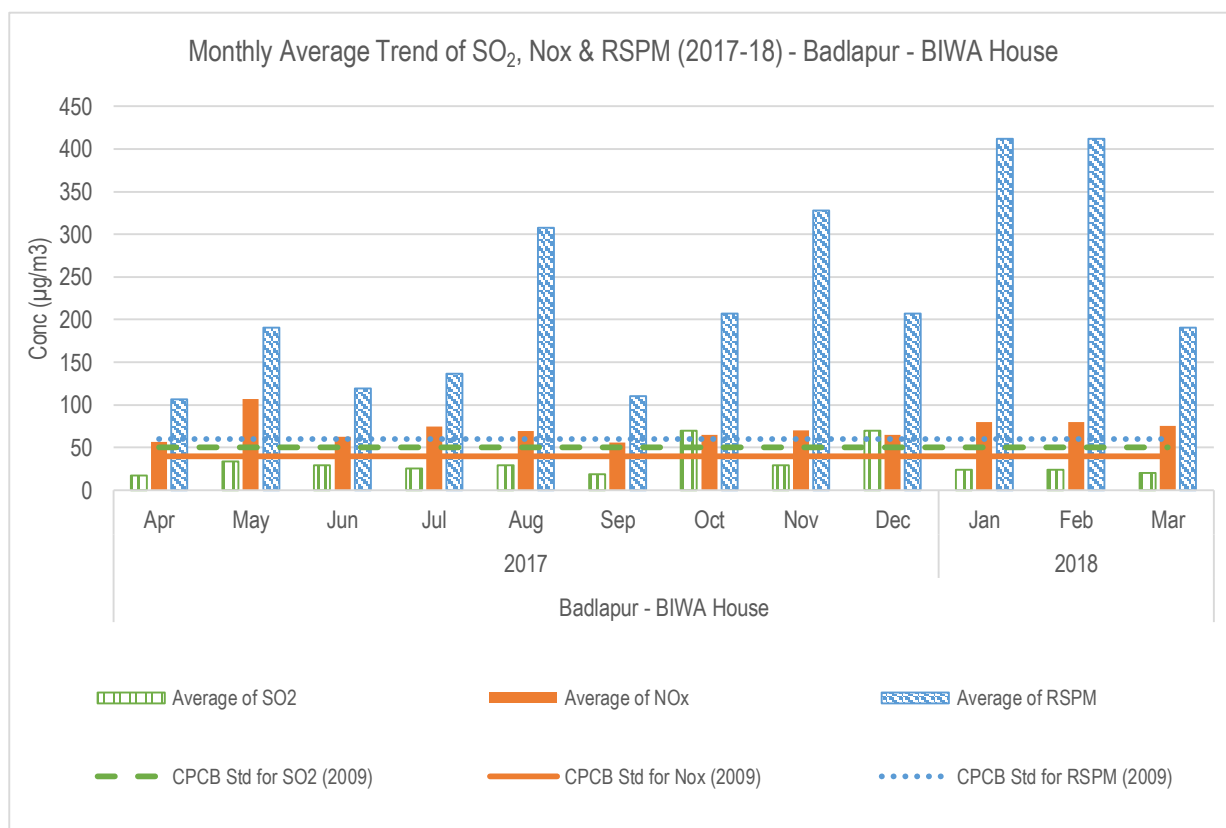


Figure No. 73: Monthly average reading recorded at Badlapur - BIWA House

Table No. 68: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Badlapur - BIWA House

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Badlapur - BIWA House	06-07	27	39	141
	07-08	30	42	93
	08-09	35	76	98
	09-10	55	85	103
	10-11	36	74	118
	11-12	41	68	121
	12-13	41	69	100
	13-14	35	49	96
	14-15	29	51	101
	15-16	23	61	113
	16-17	25	68	120
	17-18	31	73	239

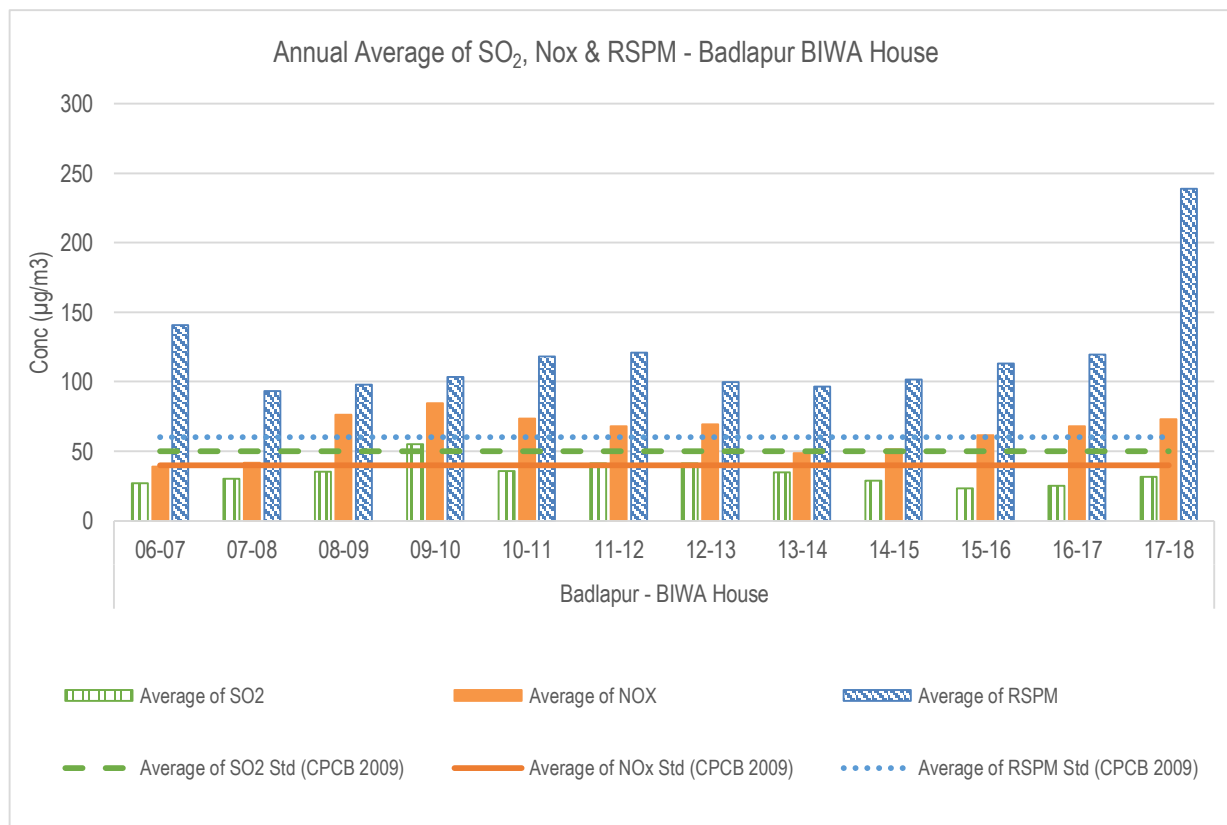


Figure No. 74: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Badlapur - BIWA House

## Bhiwandi - IGM Hospital

Table No. 69: Data for Monthly average reading recorded at IGM Hospital - Bhiwandi

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
I.G.M. Hospital	2017	Apr	34	44	67
		May	35	44	67
		Jun	32	45	66
		Jul	32	44	80
		Aug	36	51	67
		Sep	34	44	67
		Oct	30	42	75
		Nov	34	44	67
		Dec	27	36	68
		2018	Jan	29	42
	Feb		27	38	64
	Mar		26	37	68

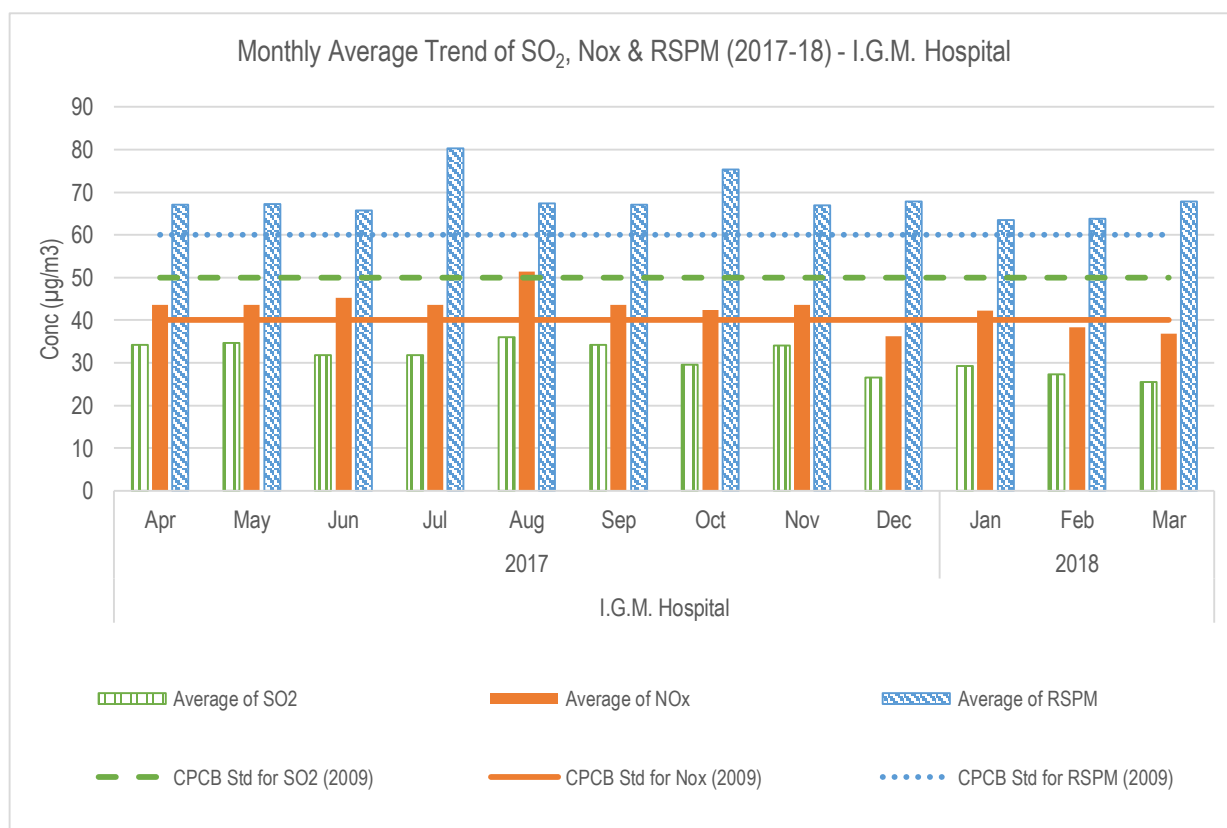


Figure No. 75: Monthly average reading recorded at IGM Hospital - Bhiwandi

Table No. 70: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at IGM Hospital - Bhiwandi

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
I.G.M. Hospital	11-12	23	29	62
	12-13	26	35	63
	13-14	30	40	72
	14-15	32	42	72
	15-16	34	43	73
	16-17	33	45	71
	17-18	31	42	68

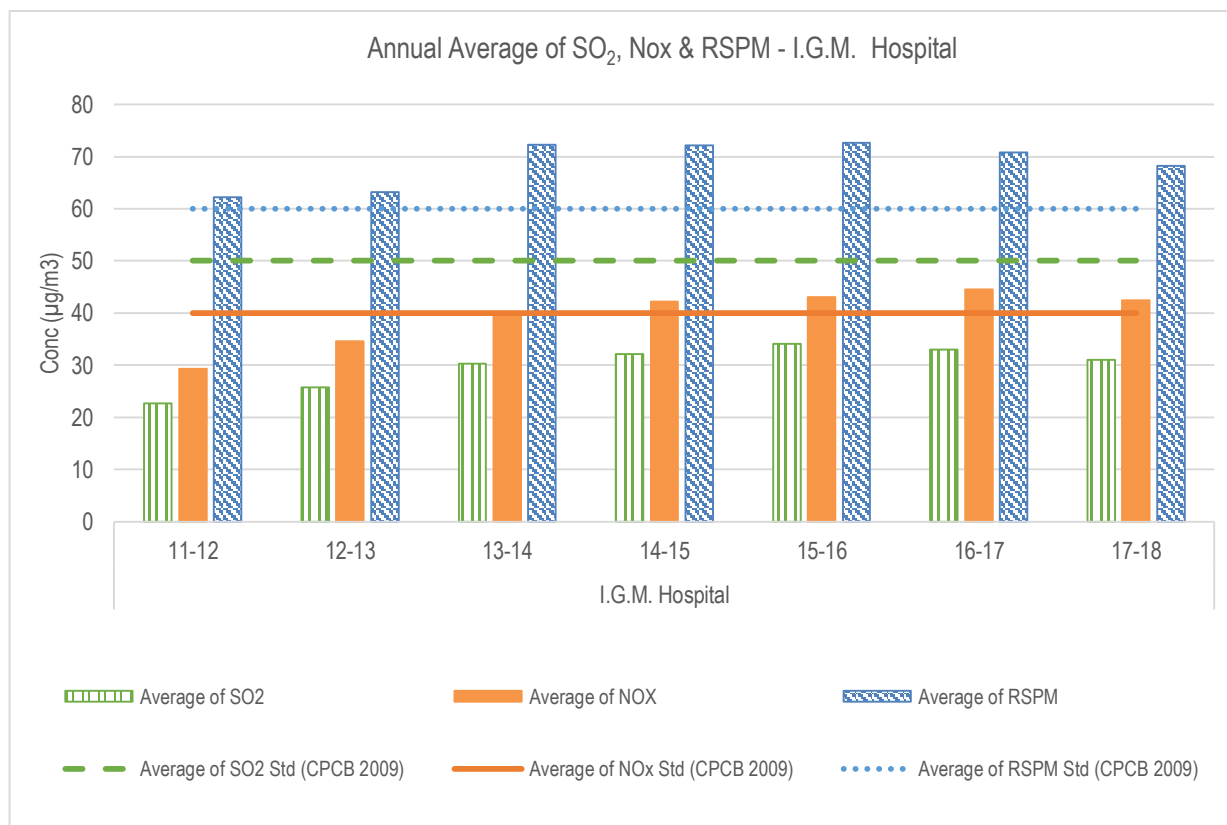


Figure No. 76: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at IGM Hospital - Bhiwandi

## Bhiwandi - Prematai Hall

Table No. 71: Data for Monthly average reading recorded at Prematai Hall - Bhiwandi

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Prematai hall	2017	Apr	35	43	66
		May	35	43	66
		Jun	30	42	63
		Jul	29	42	76
		Aug	34	46	66
		Sep	35	47	66
		Oct	35	43	66
		Nov	36	43	66
		Dec	35	43	66
	2018	Jan	33	42	64
		Feb	37	45	64
		Mar	34	44	67

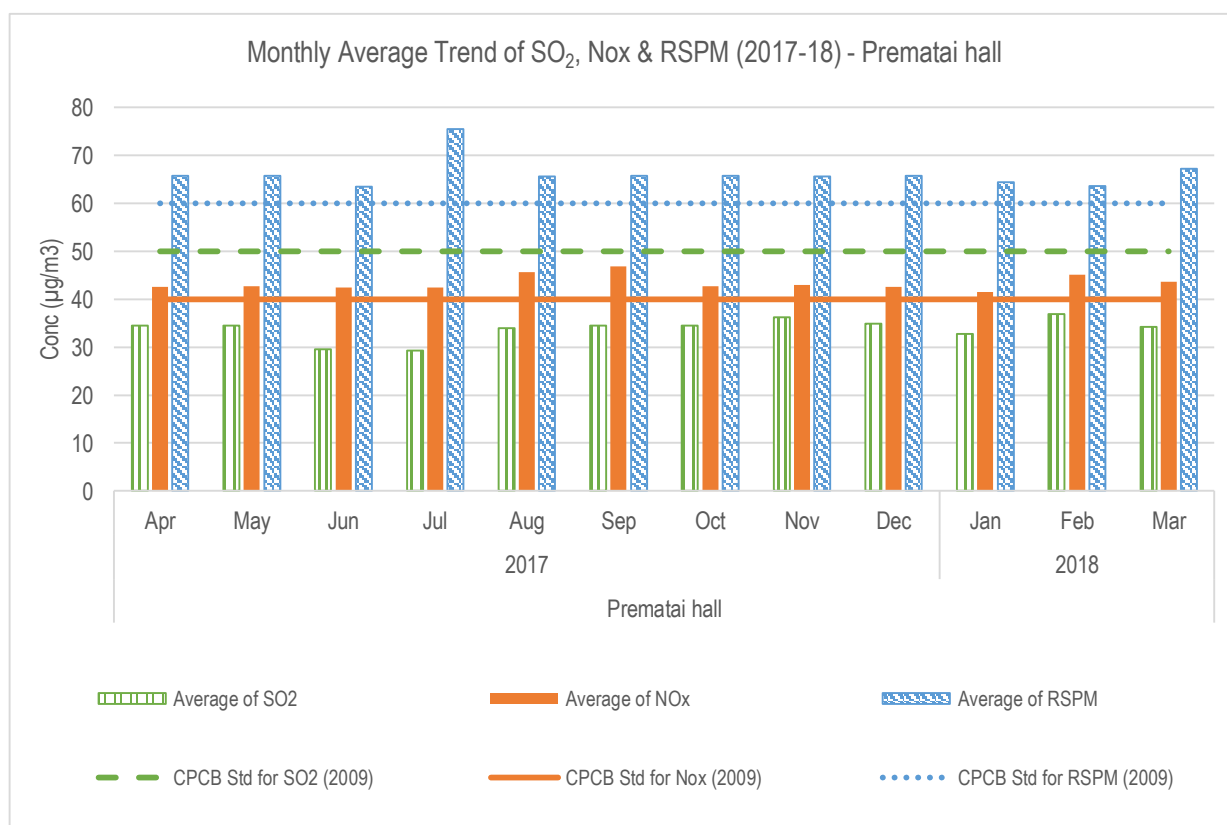


Figure No. 77: Monthly average reading recorded at Prematai Hall - Bhiwandi

Table No. 72: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Prematai Hall - Bhiwandi

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Prematai hall	11-12	15	23	52
	12-13	24	33	59
	13-14	29	38	66
	14-15	32	42	71
	15-16	34	44	72
	16-17	33	42	70
	17-18	34	43	66

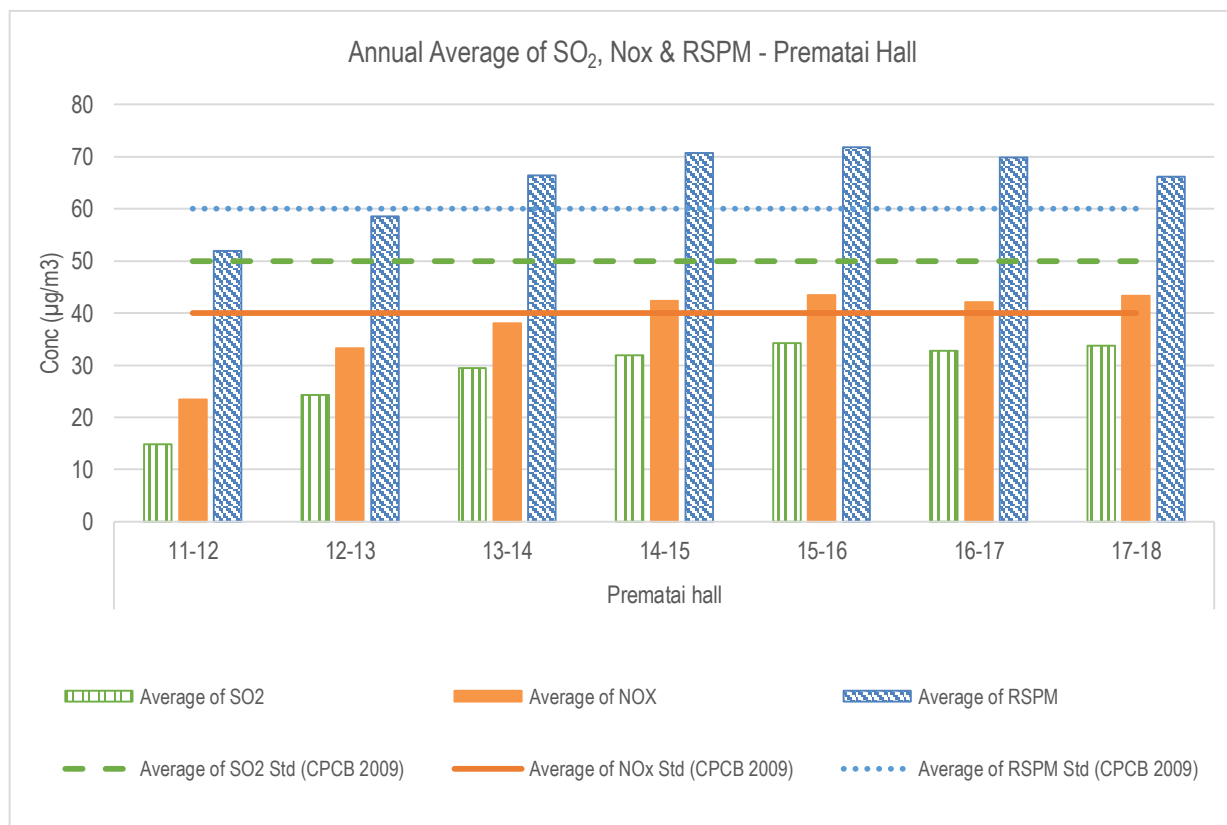


Figure No. 78: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Prematai Hall - Bhiwandi



## Dombivali

Table No. 73: Data for Monthly average reading recorded at Dombivali

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Dombivali	2017	Apr	23	52	77
		May	29	102	147
		Jun	31	69	127
		Jul	29	72	114
		Aug	24	69	348
		Sep	24	71	314
		Oct	22	79	428
	2018	Feb	27	97	475
		Mar	28	80	185

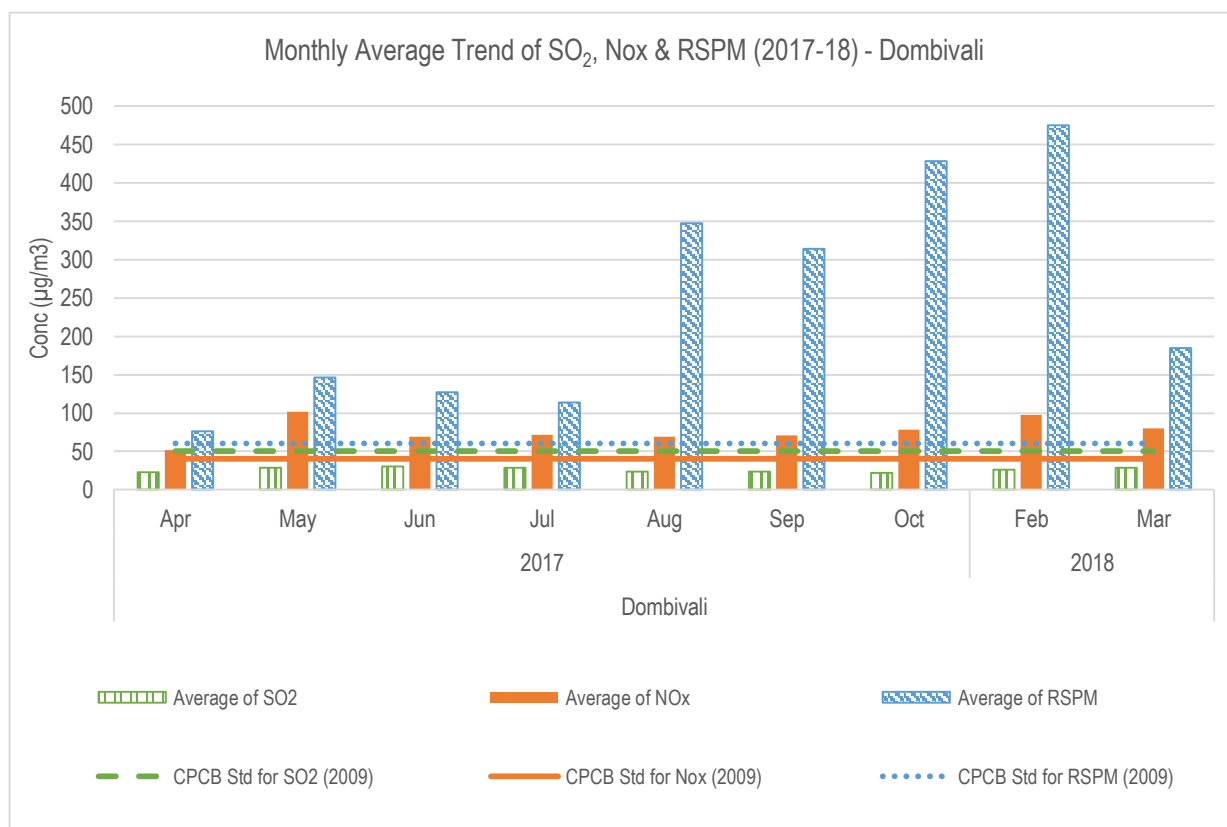


Figure No. 79: Monthly average reading recorded at Dombivali

Table No. 74: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Dombivali

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Dombivali	04-05	42	38	71
	05-06	35	52	109
	06-07	24	38	120
	07-08	37	41	98
	08-09	34	55	68
	12-13	50	94	123
	13-14	35	66	111
	14-15	29	62	111
	15-16	23	58	112
	16-17	27	70	112
	17-18	26	77	248

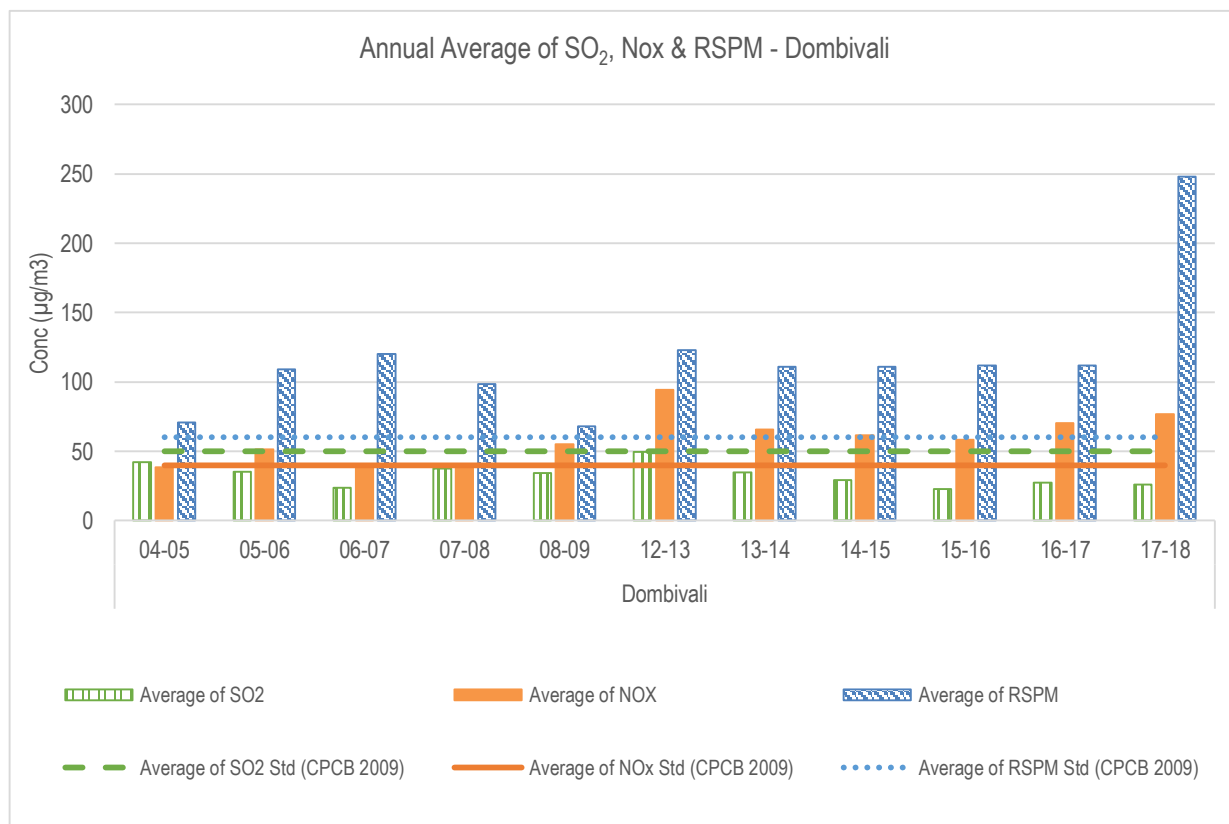


Figure No. 80: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Dombivali

## Dombivali - MIDC Office Dombivali

Table No. 75: Data for Monthly average reading recorded at MIDC Office - Dombivali

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			<b>50</b>	<b>40</b>	<b>60</b>
MIDC Office Dombivali	2017	Apr	22	52	88
		May	16	90	107
		Jun	29	62	117
		Jul	24	64	119
		Aug	27	77	187
		Sep	27	69	226
		Oct	23	80	303
		Nov	27	69	226
		Dec	23	80	303
	2018	Jan	27	76	242
		Feb	25	84	580
		Mar	27	76	242

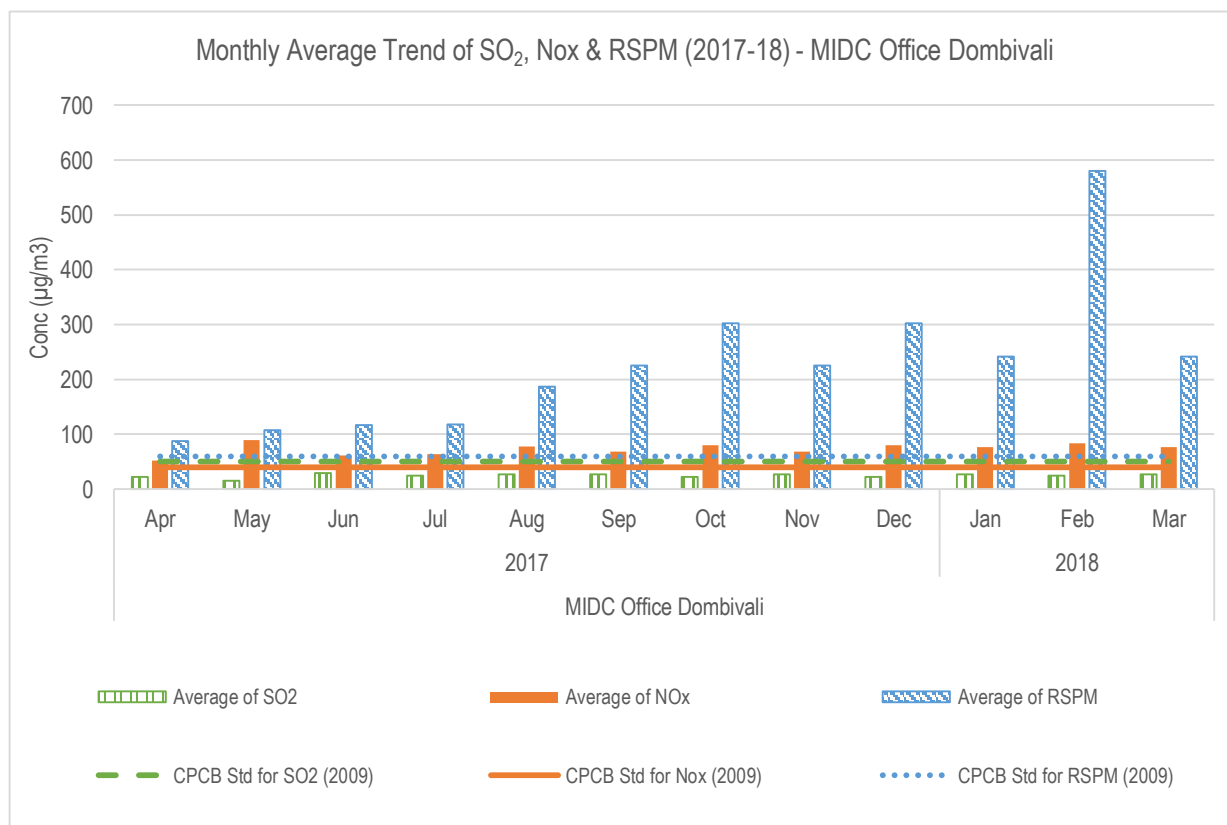


Figure No. 81: Monthly average reading recorded at MIDC Office - Dombivali

Table No. 76: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Office - Dombivali

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
MIDC Office Dombivali	12-13	37	61	86
	13-14	32	62	109
	14-15	29	67	124
	15-16	21	58	110
	16-17	26	69	120
	17-18	24	73	213

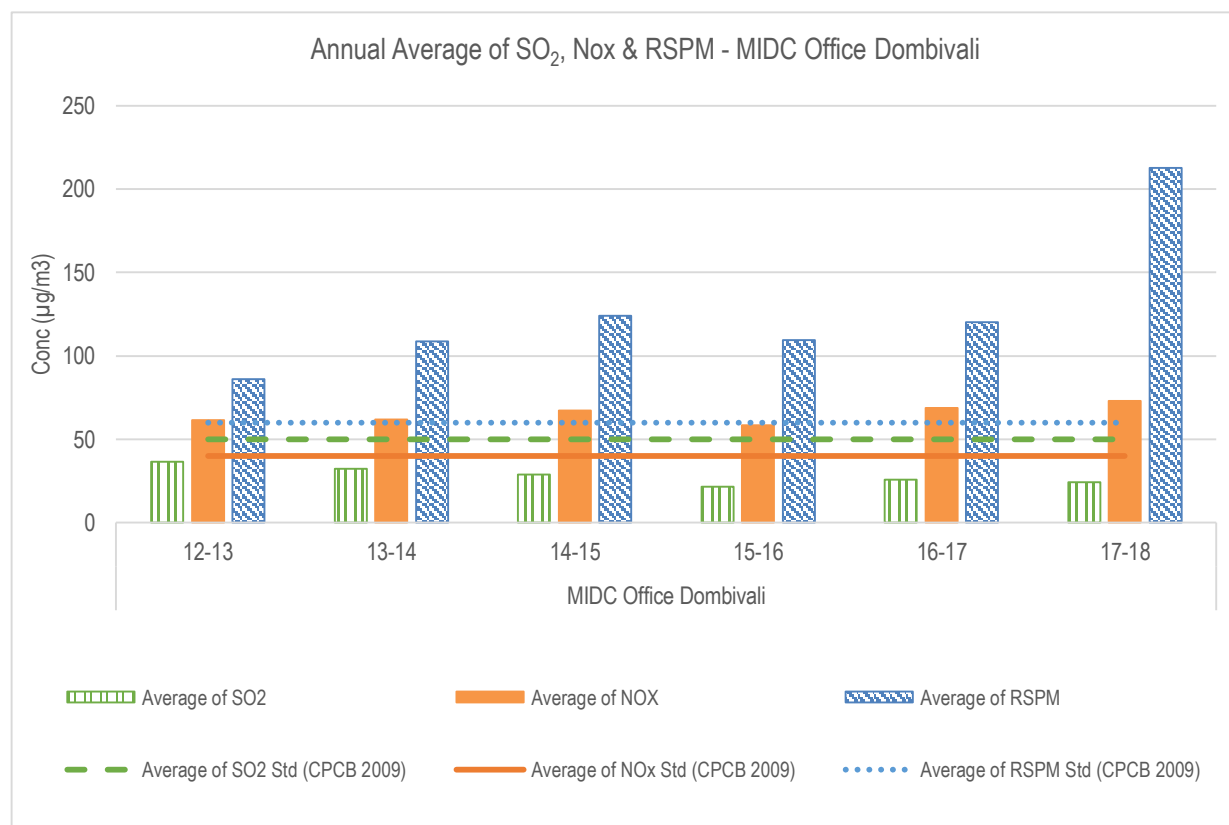


Figure No. 82: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Office - Dombivali

## Dombivali - Dombivali CAAQMS

Table No. 77: Data for Monthly average reading recorded at Dombivali CAAQMS

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Dombivali CAAQMS	2017	Apr	17	61	125
		May	8	93	75
		Jun	13	73	85
		Jul	6	52	45
		Aug	9	34	40
		Sep	22	17	56
		Oct	22	30	71
		Nov	36	82	92
		Dec	35	86	79
	2018	Jan	31	102	80
		Feb	32	90	142
		Mar	22	67	146
		Apr	8	59	98

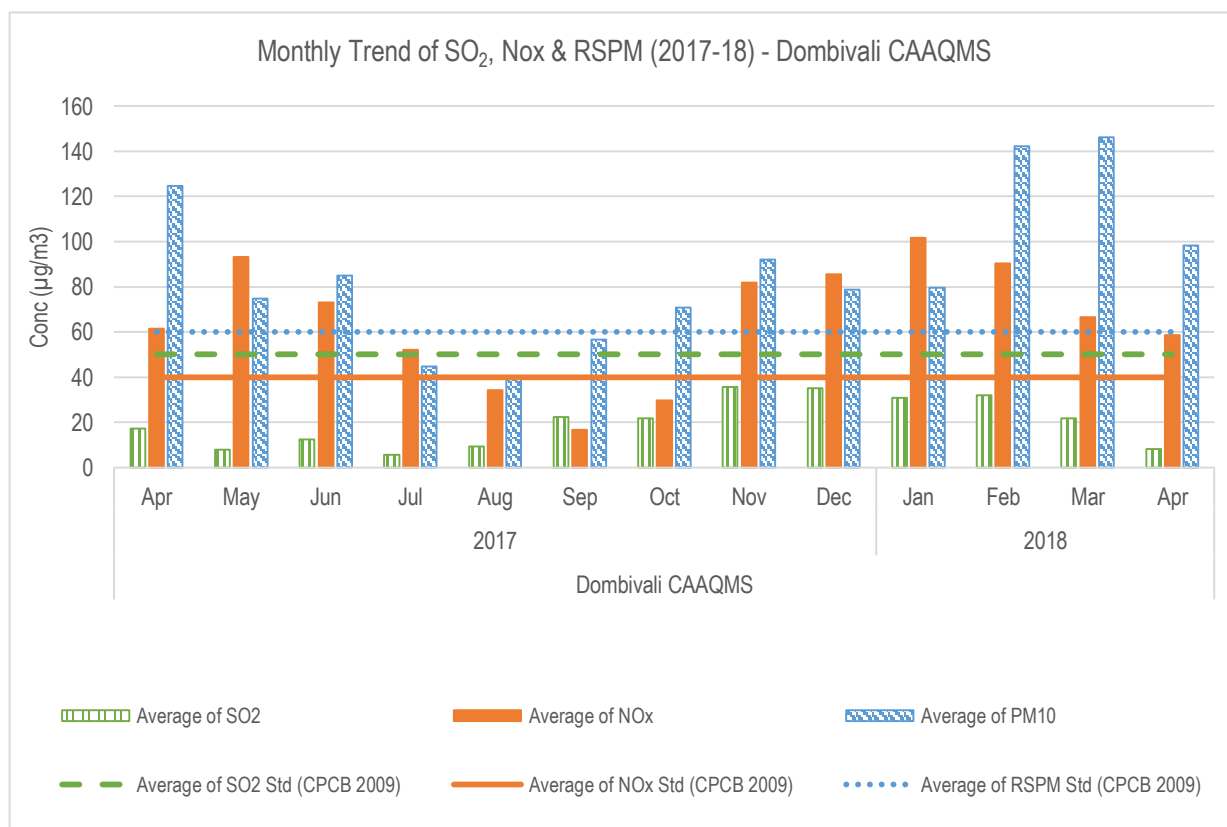
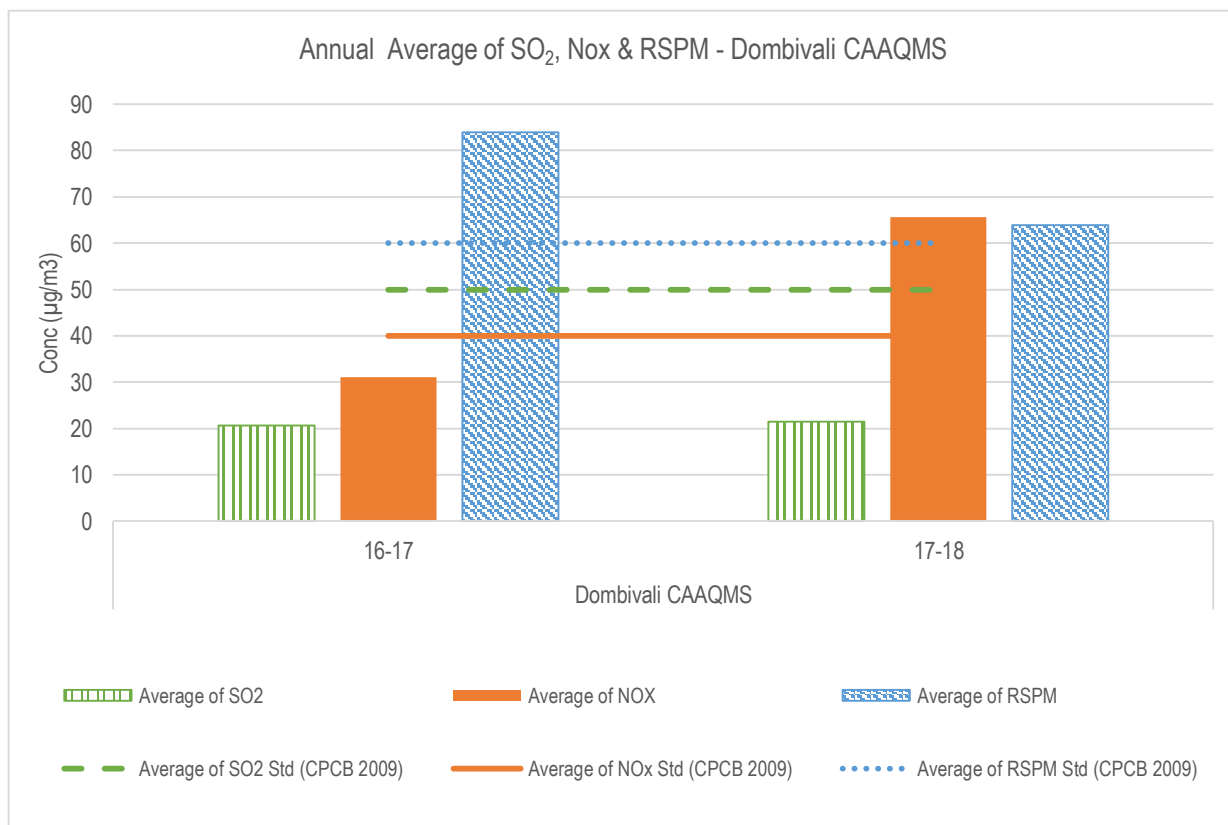


Figure No. 83: Monthly average reading recorded at Dombivali CAAQMS

**Table No. 78: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Dombivali CAAQMS**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Dombivali CAAQMS	16-17	21	31	84
	17-18	21	66	64



**Figure No. 84: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Dombivali CAAQMS**

## Kalyan - MPCB RO Kalyan Office

Table No. 79: Data for Monthly average reading recorded at MPCB RO Kalyan Office

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
MPCB RO Kalyan office	2017	Apr	32	37	69
		May	27	37	68
		Jun	46	47	68
		Jul	32	44	80
		Aug	34	46	67
		Sep	27	37	68
		Oct	27	37	68
		Nov	29	42	68
		Dec	32	45	66
	2018	Jan	28	41	64
		Feb	25	34	71
		Mar	35	43	66

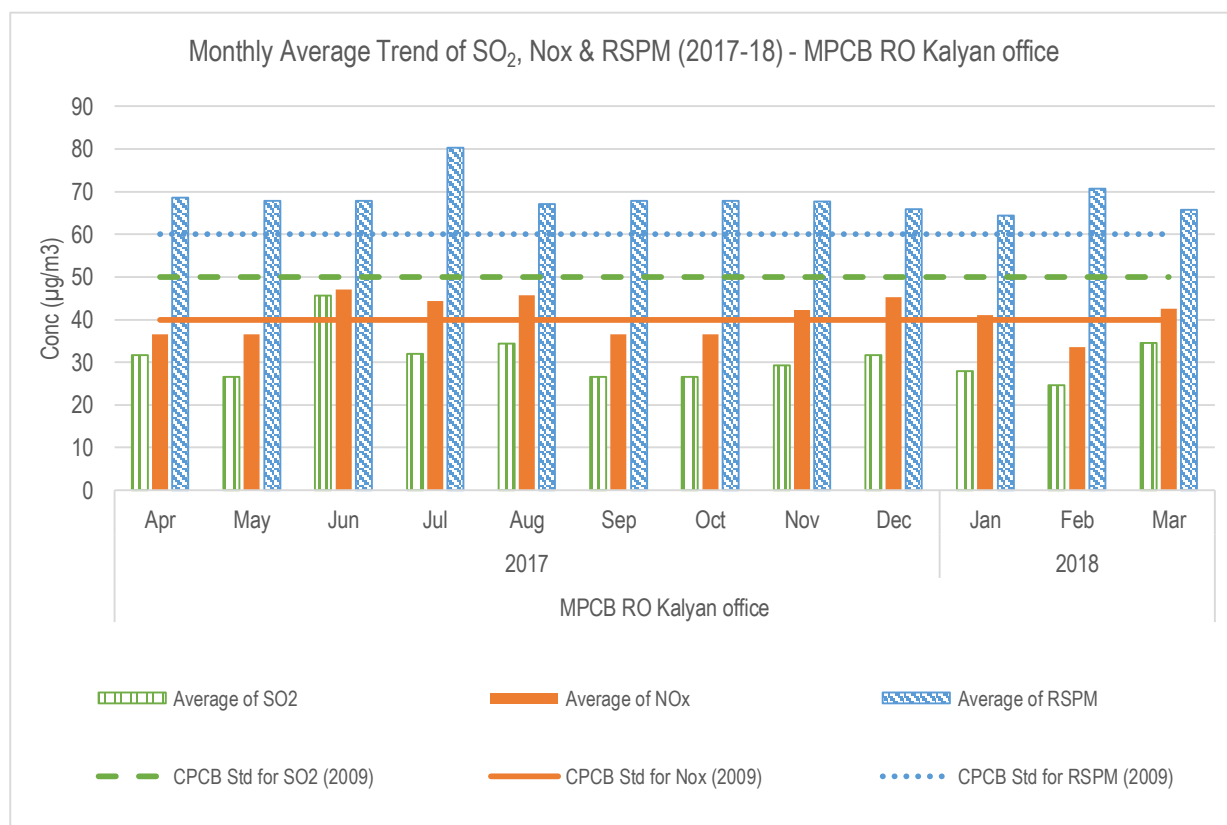


Figure No. 85: Monthly average reading recorded at MPCB RO Kalyan Office

Table No. 80: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MPCB RO Kalyan Office

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
MPCB RO Kalyan office	11-12	22	34	71
	12-13	29	38	65
	13-14	30	38	69
	14-15	30	37	71
	15-16	32	40	71
	16-17	33	41	69
	17-18	31	41	69

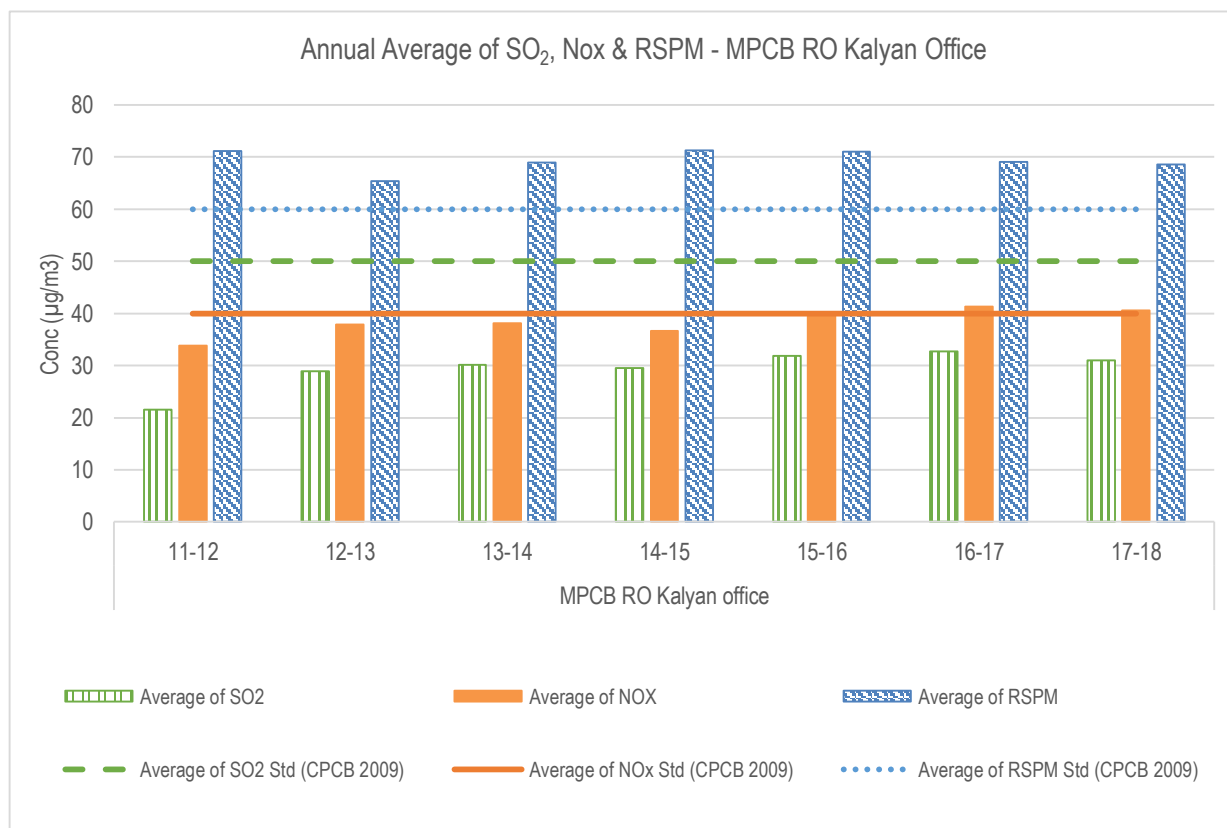


Figure No. 86: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MPCB RO Kalyan Office



## Ulhasnagar - Smt. CHM College Campus

Table No. 81: Data for Monthly average reading recorded at Smt. CHM College Campus, Ulhasnagar

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Smt. CHM College Campus	2017	Apr	17	54	102
		May	32	79	143
		Jun	29	65	123
		Jul	21	65	121
		Aug	21	65	151
		Sep	20	50	116
		Oct	18	67	246
		Nov	20	50	116
		Dec	18	67	246
	2018	Jan	19	65	94
		Feb	21	72	218
		Mar	19	65	94

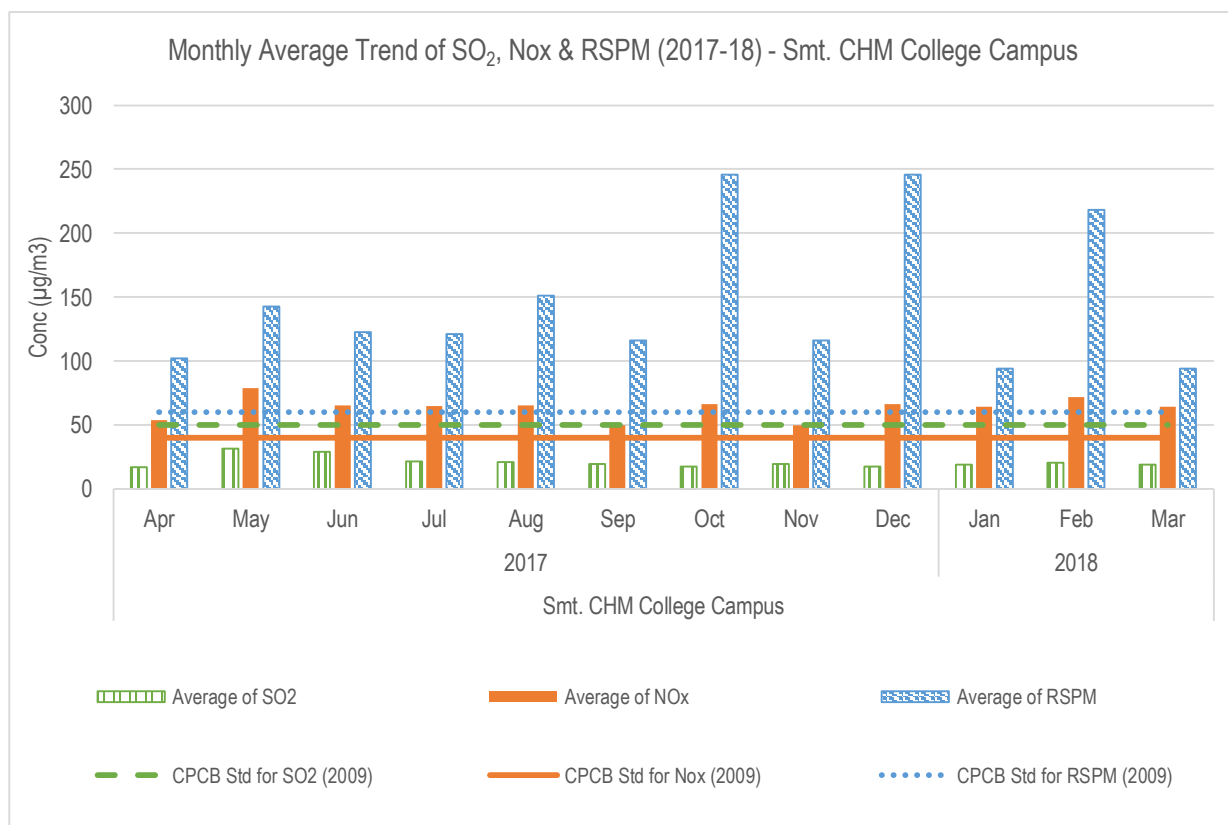
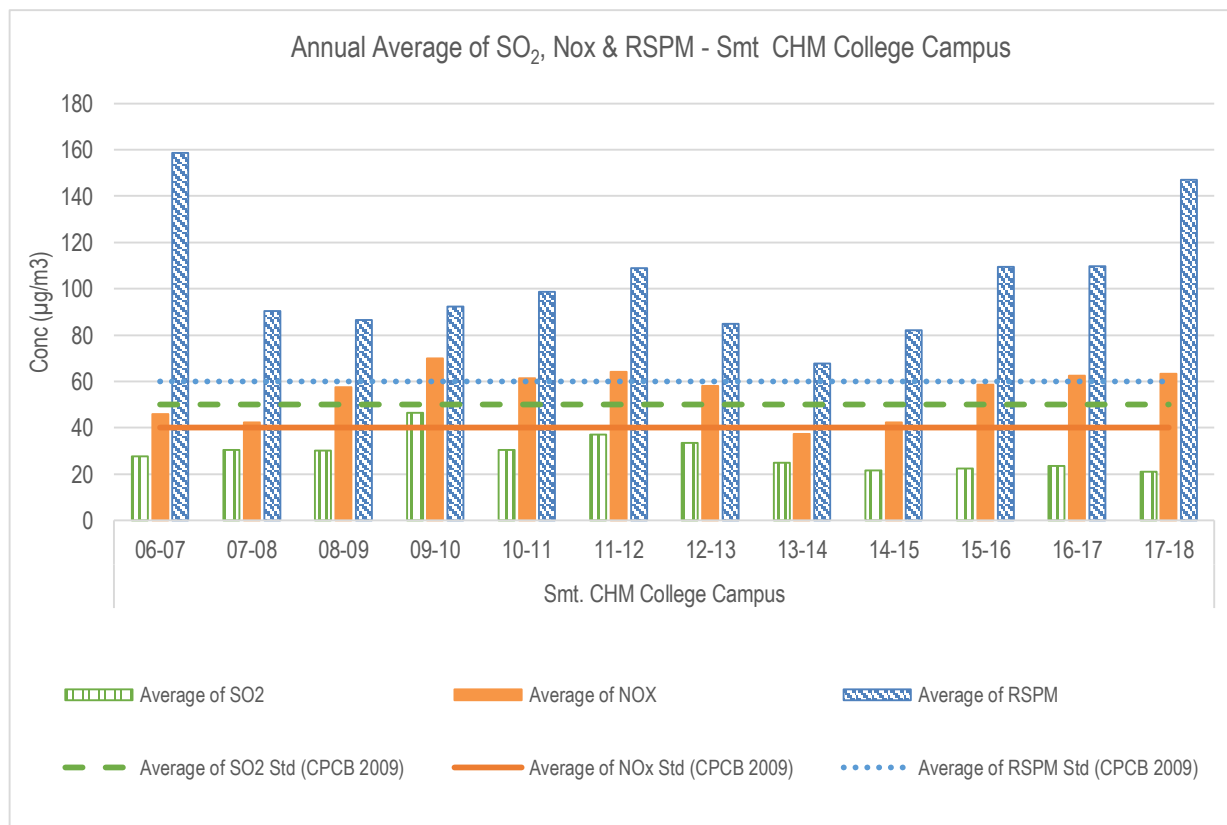


Figure No. 87: Monthly average reading recorded at Smt. CHM College Campus, Ulhasnagar

**Table No. 82: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Smt. CHM College Campus, Ulhasnagar**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Smt. CHM College Campus	06-07	28	46	159
	07-08	31	42	90
	08-09	30	57	87
	09-10	46	70	92
	10-11	30	61	99
	11-12	37	64	109
	12-13	34	58	85
	13-14	25	37	68
	14-15	22	42	82
	15-16	22	59	109
	16-17	23	62	110
	17-18	21	63	147



**Figure No. 88: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Smt. CHM College Campus, Ulhasnagar**

## Ulhasnagar - Powai Chowk

Table No. 83: Data for Monthly average reading recorded at Powai Chowk - Ulhasnagar

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Powai Chowk	2017	May	35	101	159
		Jun	45	88	160
		Jul	31	90	143
		Aug	33	87	301
		Sep	23	60	187
		Oct	23	74	311
		Nov	23	60	187
		Dec	23	74	311
	2018	Jan	24	69	178
		Feb	22	79	473
		Mar	24	69	178

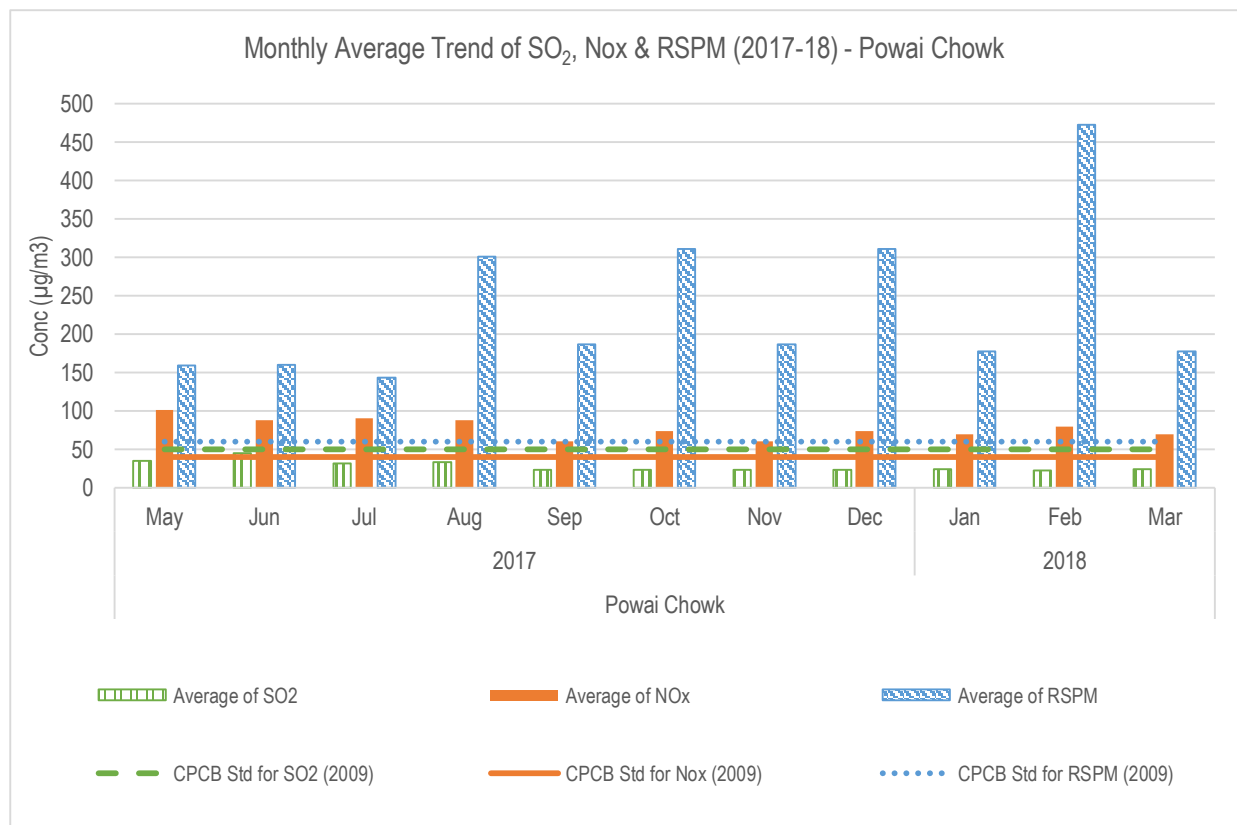


Figure No. 89: Monthly average reading recorded at Powai Chowk - Ulhasnagar

Table No. 84: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Powai Chowk - Ulhasnagar

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Powai Chowk	06-07	24	38	121
	07-08	25	37	91
	08-09	33	69	95
	09-10	53	96	119
	10-11	31	69	114
	11-12	43	74	122
	12-13	43	81	106
	13-14	33	58	99
	14-15	30	57	106
	15-16	25	67	126
	16-17	27	67	108
	17-18	28	78	240

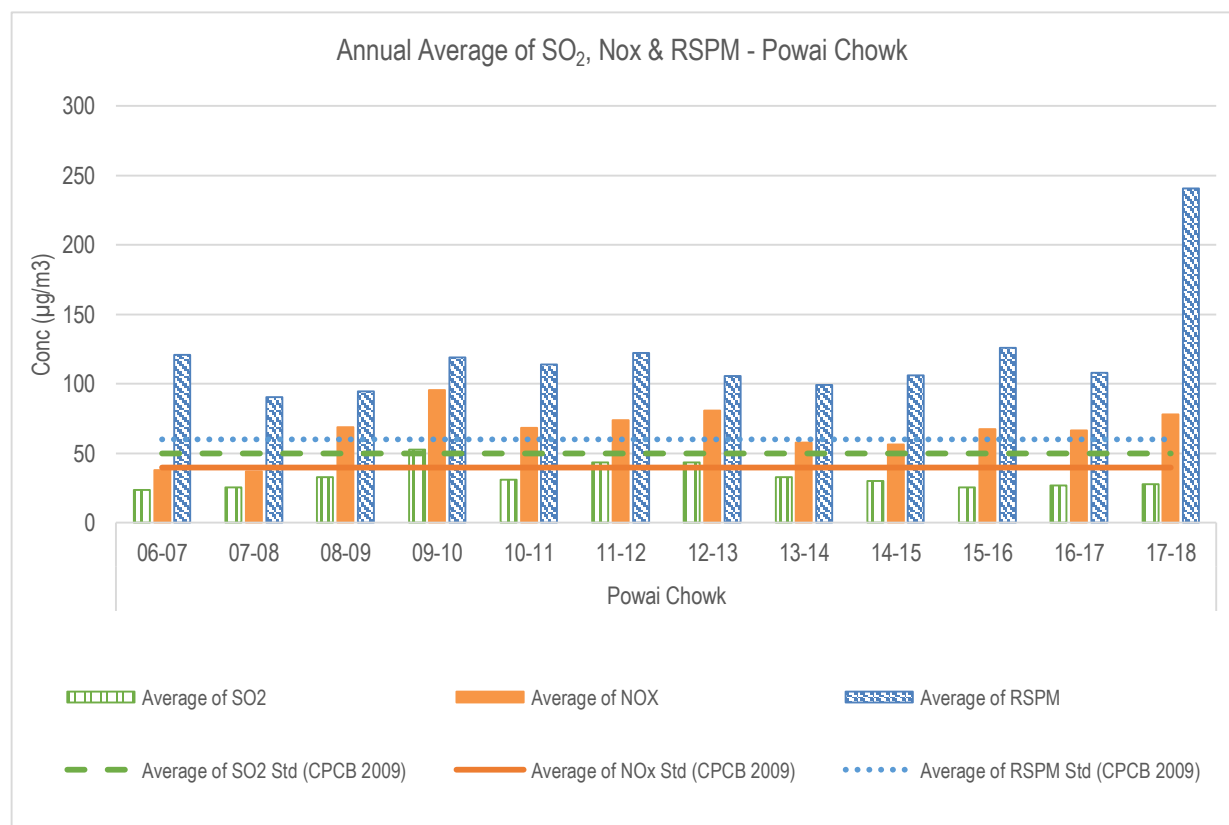
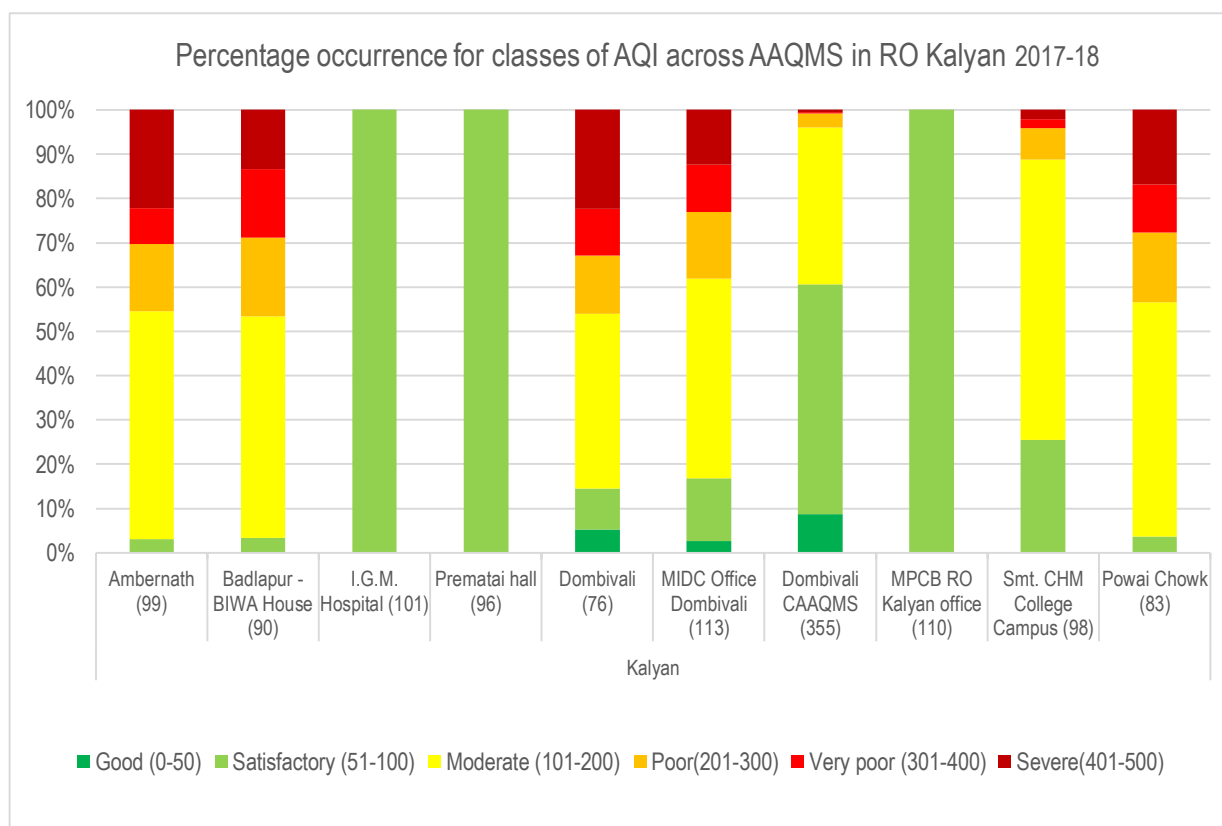


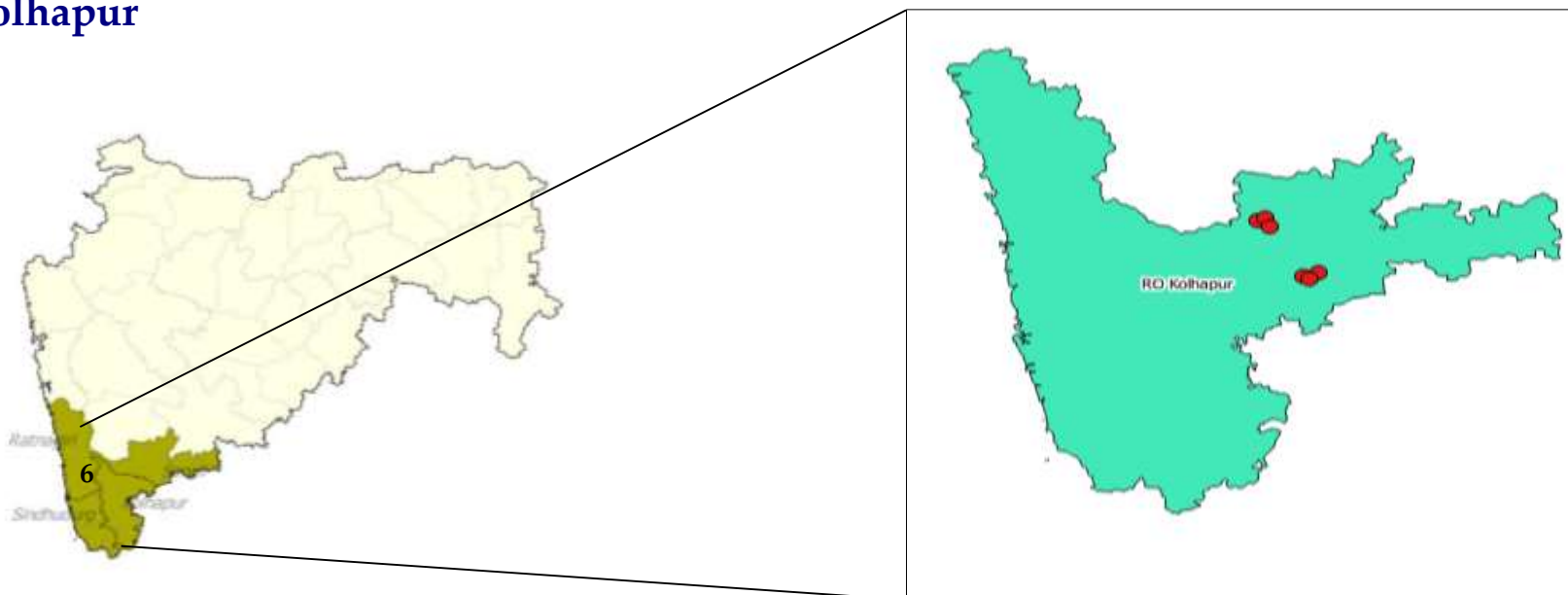
Figure No. 90: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Powai Chowk - Ulhasnagar

Table No. 85: Percentage exceedance of pollutants at Kalyan RO

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Ambernath	99	0	27	96	0	27	97
Badlapur - BIWA House	90	2	22	87	2	24	97
I.G.M. Hospital	101	0	0	0	0	0	0
Prematai hall	96	0	0	0	0	0	0
Dombivali	76	0	28	65	0	37	86
MIDC Office Dombivali	113	0	42	93	0	37	82
Dombivali CAAQMS	355	14	271	185	0	0	40
MPCB RO Kalyan office	110	0	0	0	0	0	0
Smt. CHM College Campus	98	0	9	73	0	9	74
Powai Chowk	83	0	30	80	0	36	96



## Ro - Kolhapur



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Kolhapur	Kolhapur	508	Shivaji University Campus	Residential	17° 07' 40.1" N	74° 25' 16.9" E
	Kolhapur	509	Ruikar Trust	Rural and other areas	17° 10' 25.4" N	74° 24' 10.1" E
	Kolhapur	510	Mahadwar Road	Residential	17° 09' 27.0" N	74° 22' 10.6" E
	Sangli	574	Terrace of SRO-Sangli, Udyog Bhavan	Residential	16° 51' 11.8" N	74° 35' 28.9" E
	Sangli	575	Sangli-Miraj Primary Municipal school	Rural and other areas	16° 51' 39.4" N	74° 33' 52.5" E
	Sangli	576	Krishna Valley school	Industrial	16° 52' 49.4" N	74° 38' 02.3" E

## Kolhapur - Shivaji University Campus

Table No. 86: Data for Monthly average reading recorded at Shivaji University Campus

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Shivaji University Campus	2017	Apr	14	28	78
		May	13	24	63
		Jun	13	23	52
		Jul	11	21	43
		Aug	11	17	40
		Sep	10	13	43
		Oct	12	18	57
		Nov	11	16	57
		Dec	11	21	62
	2018	Jan	17	33	81
		Feb	15	27	70
		Mar	14	24	70

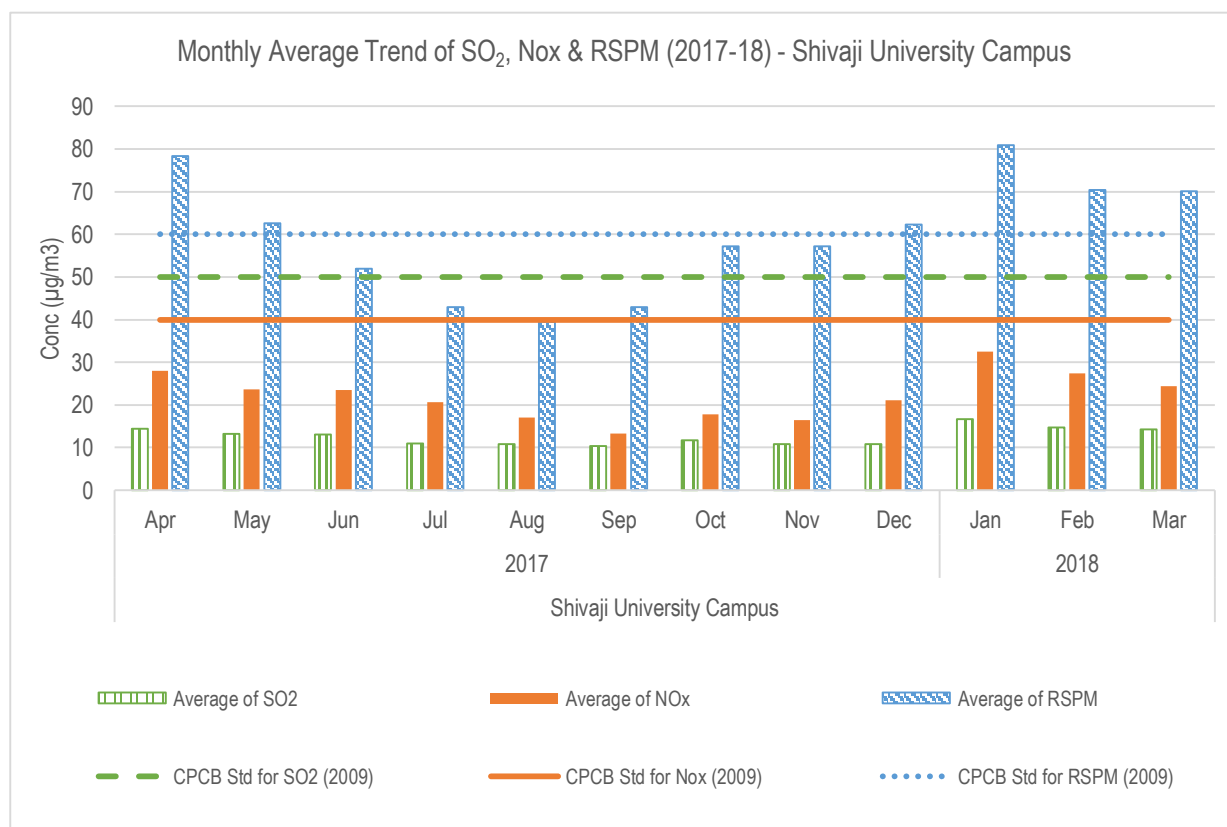


Figure No. 91: Monthly average reading recorded at Shivaji University Campus

Table No. 87: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Shivaji University Campus

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Shivaji University Campus	05-06	4	7	40
	06-07	5	7	44
	07-08	5	3	46
	08-09	8	10	62
	09-10	8	4	55
	10-11	9	9	56
	11-12	10	13	60
	12-13	12	18	61
	13-14	14	20	64
	14-15	12	22	60
	15-16	13	23	63
	16-17	11	21	61
	17-18	13	22	60

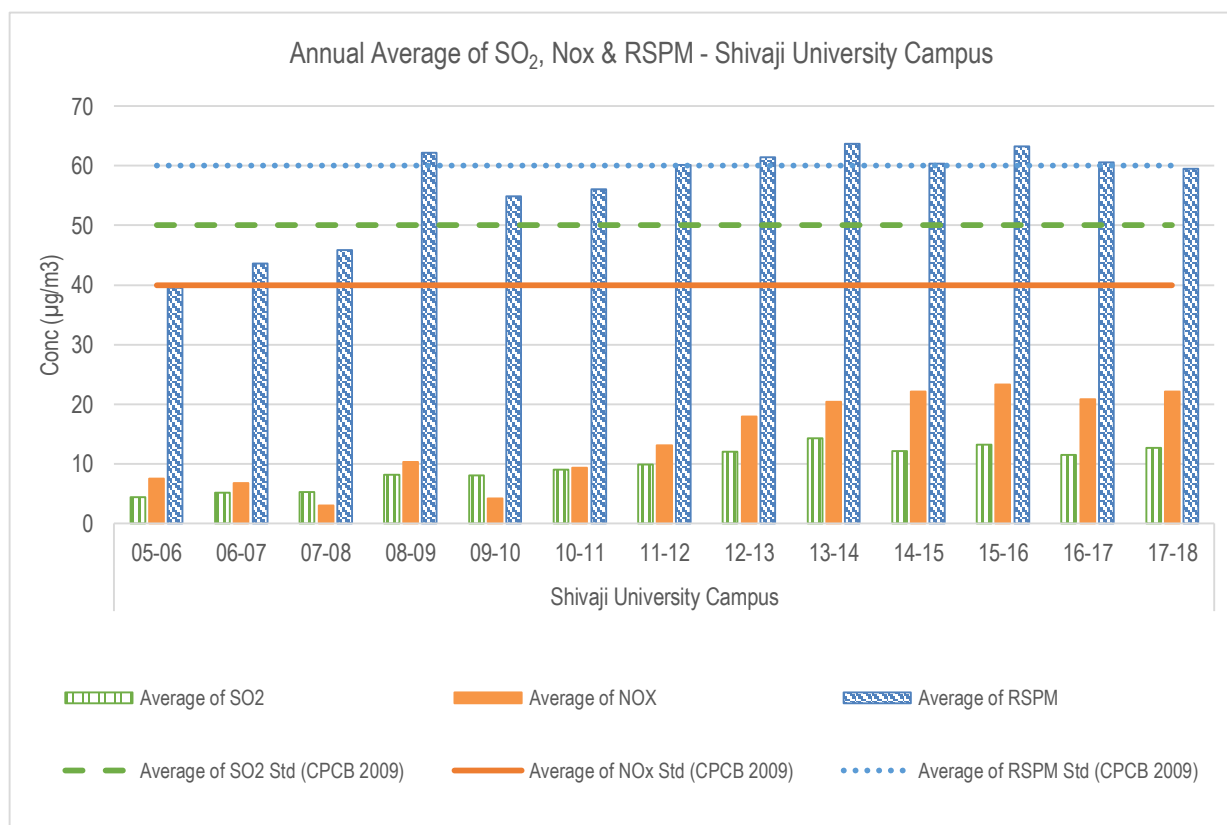


Figure No. 92: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Shivaji University Campus



## Kolhapur - Ruikar Trust

Table No. 88: Data for Monthly average reading recorded at Ruikar Trust - Kolhapur

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Ruikar Trust	2017	Apr	33	65	151
		May	30	56	120
		Jun	24	43	104
		Jul	19	33	72
		Sep	20	28	102
		Oct	26	36	106
		Nov	27	40	110
		Dec	33	59	134
	2018	Jan	37	71	146
		Feb	32	54	122
		Mar	24	48	117

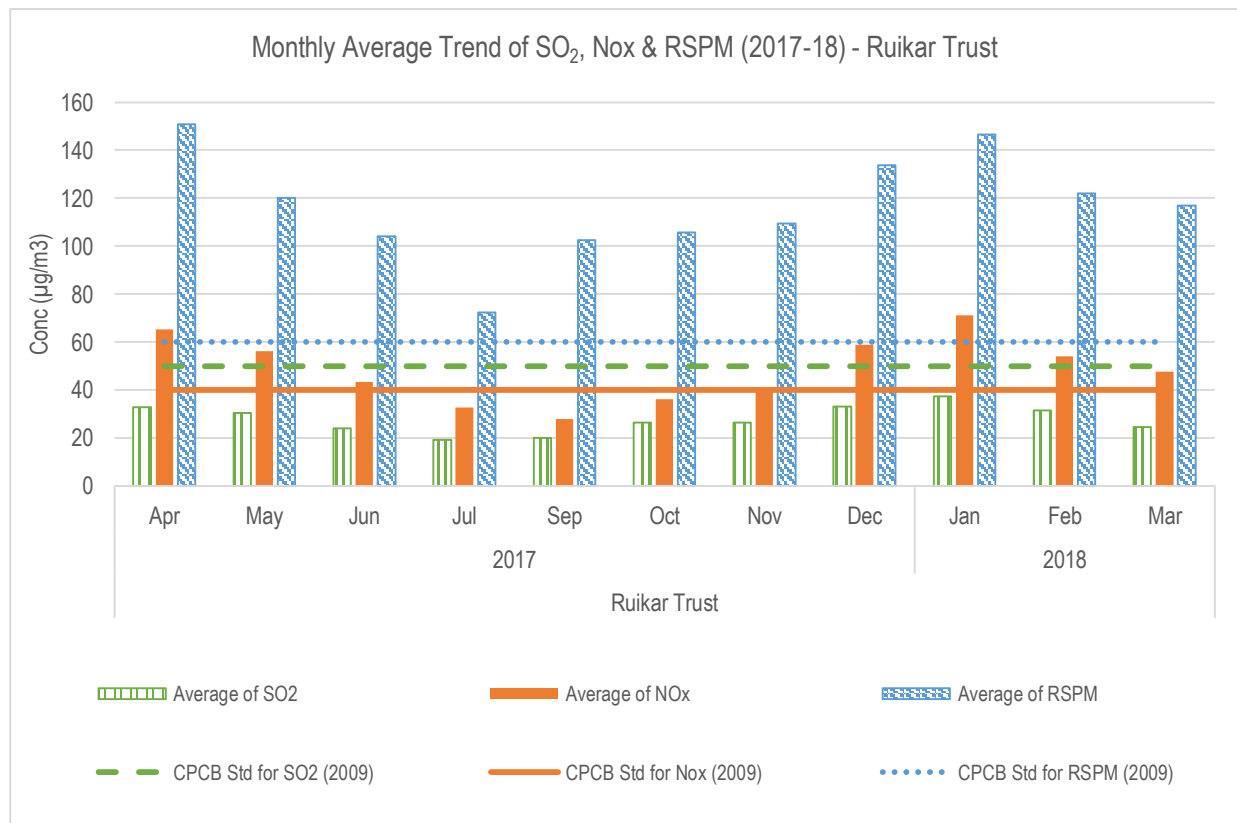


Figure No. 93: Monthly average reading recorded at Ruikar Trust - Kolhapur

Table No. 89: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ruikar Trust - Kolhapur

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Ruikar Trust	05-06	12	45	108
	06-07	11	39	96
	07-08	10	27	95
	08-09	16	27	100
	09-10	16	20	99
	10-11	21	27	105
	11-12	24	33	116
	12-13	27	42	159
	13-14	27	48	141
	14-15	28	50	118
	15-16	25	52	120
	16-17	29	53	120
	17-18	28	48	117

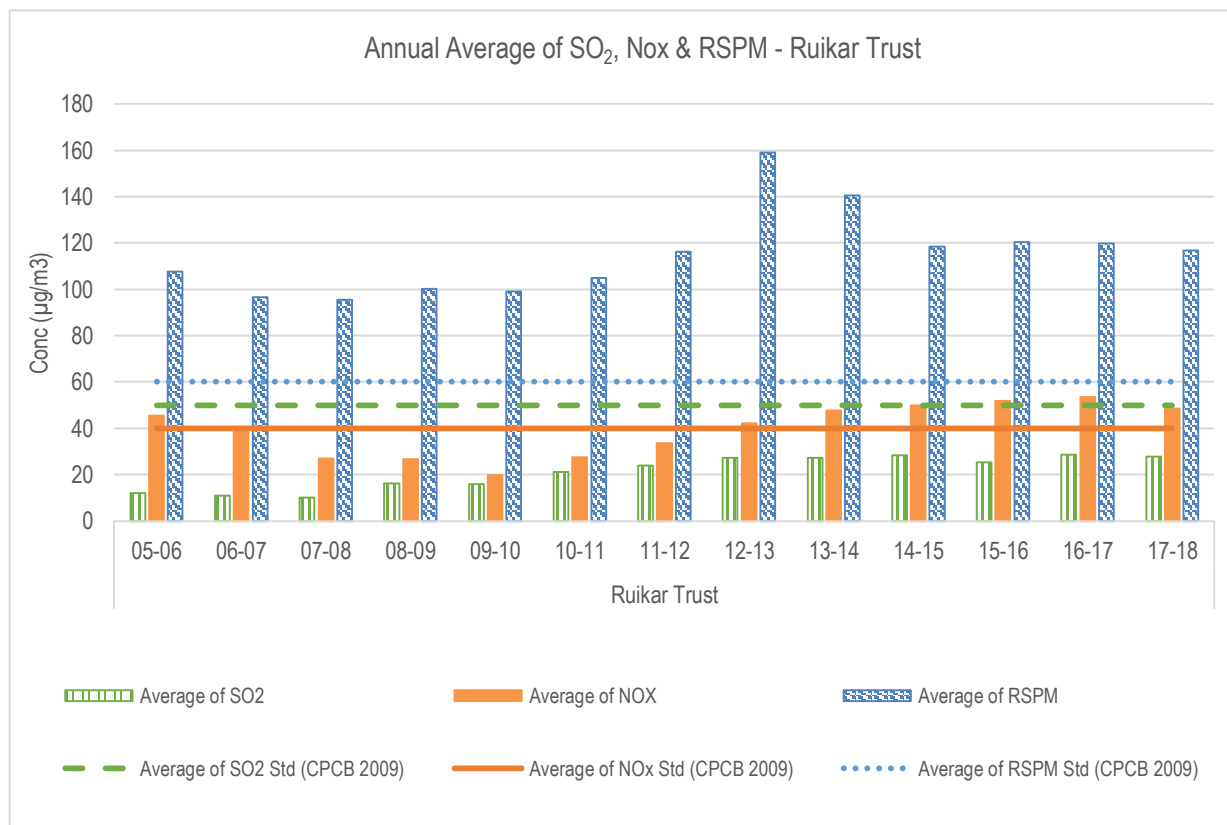


Figure No. 94: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Ruikar Trust - Kolhapur

## Kolhapur - Mahadwar Road

Table No. 90: Data for Monthly average reading recorded at Mahadwar Road

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Mahadwar Road	2017	Apr	25	47	110
		May	20	36	90
		Jun	18	31	76
		Jul	15	27	59
		Aug	19	30	72
		Sep	14	19	74
		Oct	19	25	83
		Nov	20	30	96
		Dec	26	45	111
	2018	Jan	31	62	128
		Feb	25	46	107
		Mar	20	38	98

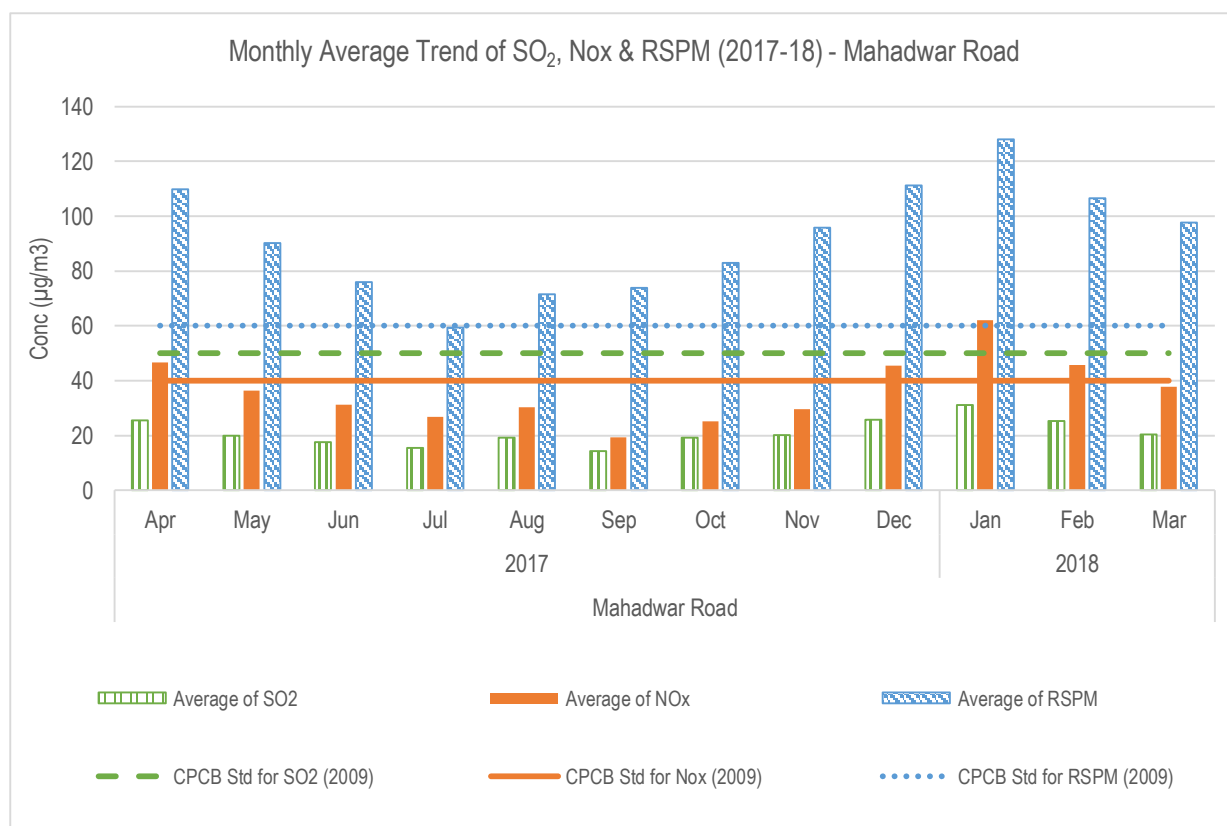
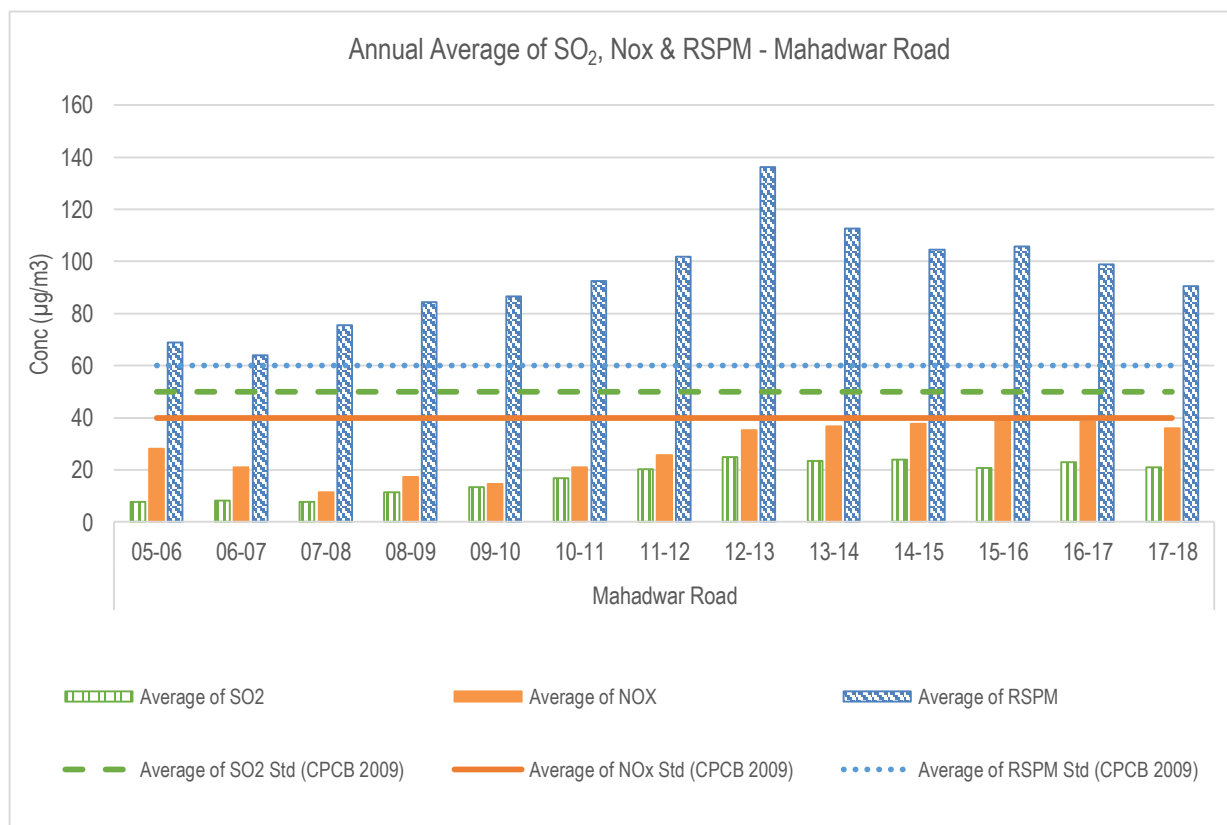


Figure No. 95: Monthly average reading recorded at Mahadwar Road

**Table No. 91: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Mahadwar Road**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Mahadwar Road	05-06	8	28	69
	06-07	8	21	64
	07-08	8	11	75
	08-09	12	17	84
	09-10	13	15	86
	10-11	17	21	92
	11-12	20	26	102
	12-13	25	35	136
	13-14	23	37	113
	14-15	24	38	104
	15-16	21	40	106
	16-17	23	39	99
	17-18	21	36	90



**Figure No. 96: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Mahadwar Road**

### Sangli - Terrace of SRO – Sangli, Udyog Bhavan

Table No. 92: Data for Monthly average reading recorded at Terrace of SRO – Sangli, Udyog Bhavan

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Terrace of SRO-Sangli, Udyog Bhavan	2017	Apr	7	22	67
		May	7	27	48
		Jun	7	24	33
		Jul	6	20	36
		Aug	8	24	36
		Sep	8	26	34
		Oct	10	32	62
		Nov	9	43	106
		Dec	10	57	150
	2018	Jan	13	55	176
		Feb	16	56	142
Mar		8	39	118	

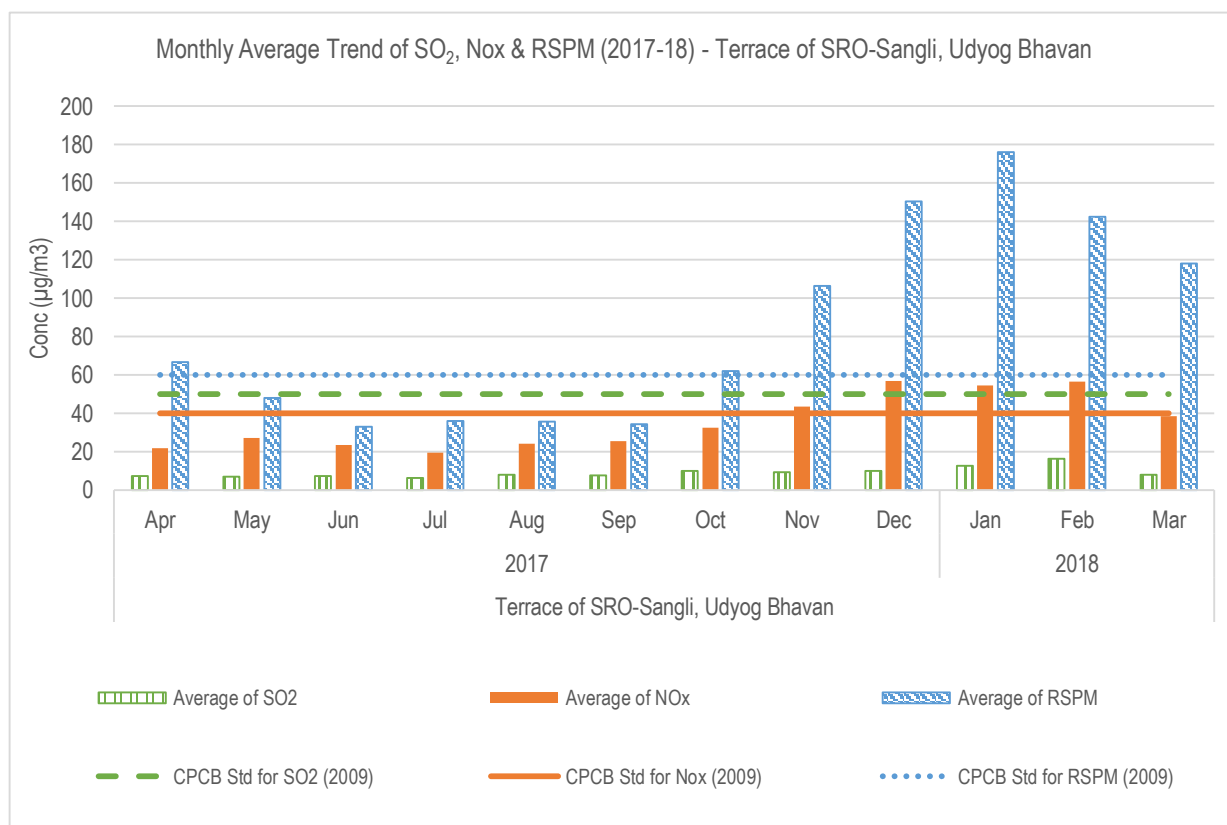


Figure No. 97: Monthly average reading recorded at Terrace of SRO – Sangli, Udyog Bhavan

Table No. 93: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Terrace of SRO – Sangli, Udyog Bhavan

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Terrace of SRO-Sangli, Udyog Bhavan	08-09	25	19	57
	09-10	22	27	54
	10-11	12	29	54
	11-12	10	36	63
	12-13	10	39	70
	13-14	9	34	69
	14-15	12	42	67
	15-16	10	38	82
	16-17	8	41	78
	17-18	9	35	83

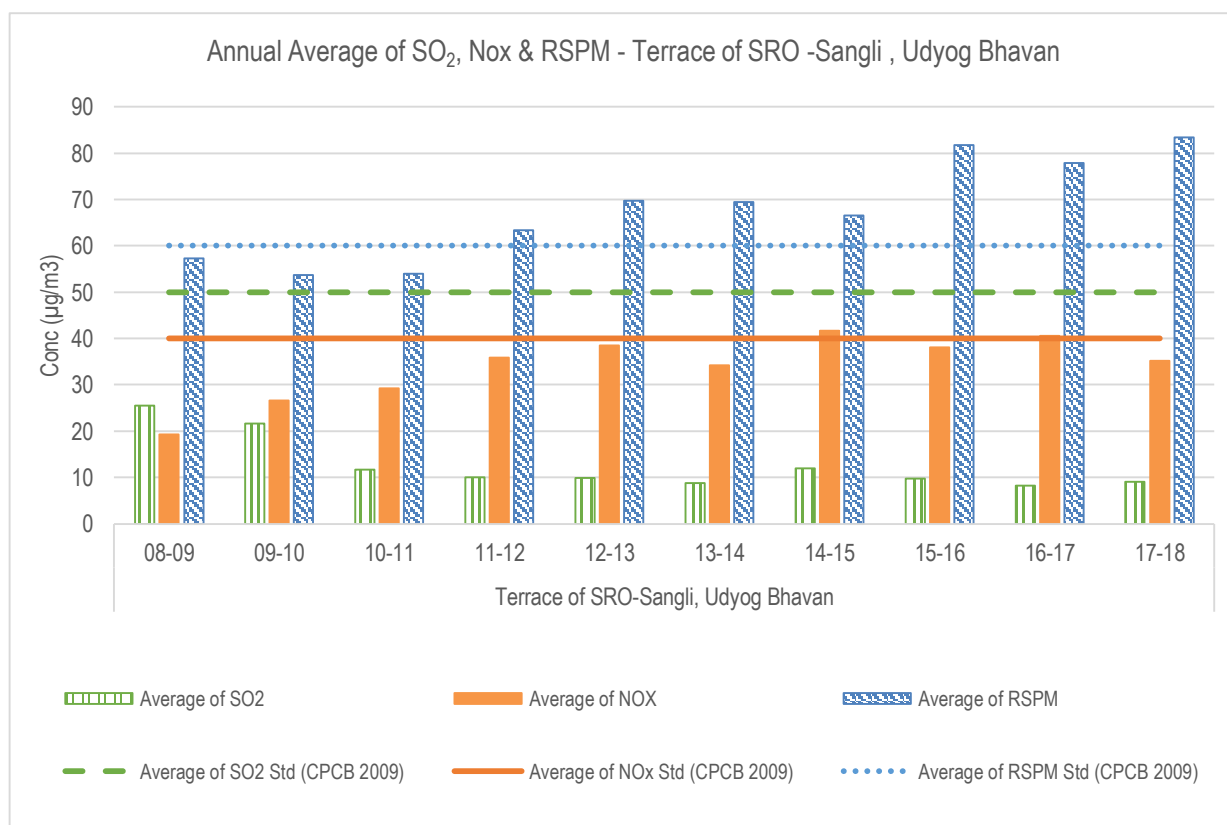


Figure No. 98: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Terrace of SRO – Sangli, Udyog Bhavan

### Sangli - Sangli - Miraj Primary Municipal School

Table No. 94: Data for Monthly average reading recorded at Sangli - Miraj Primary Municipal School

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Sangli-Miraj Primary Municipal school	2017	Apr	9	34	66
		May	8	27	43
		Jun	8	27	31
		Jul	10	21	36
		Aug	10	30	31
		Sep	9	30	37
		Oct	12	49	58
		Nov	13	56	121
		Dec	13	65	135
	2018	Jan	14	78	151
		Feb	23	123	143
		Mar	12	66	116

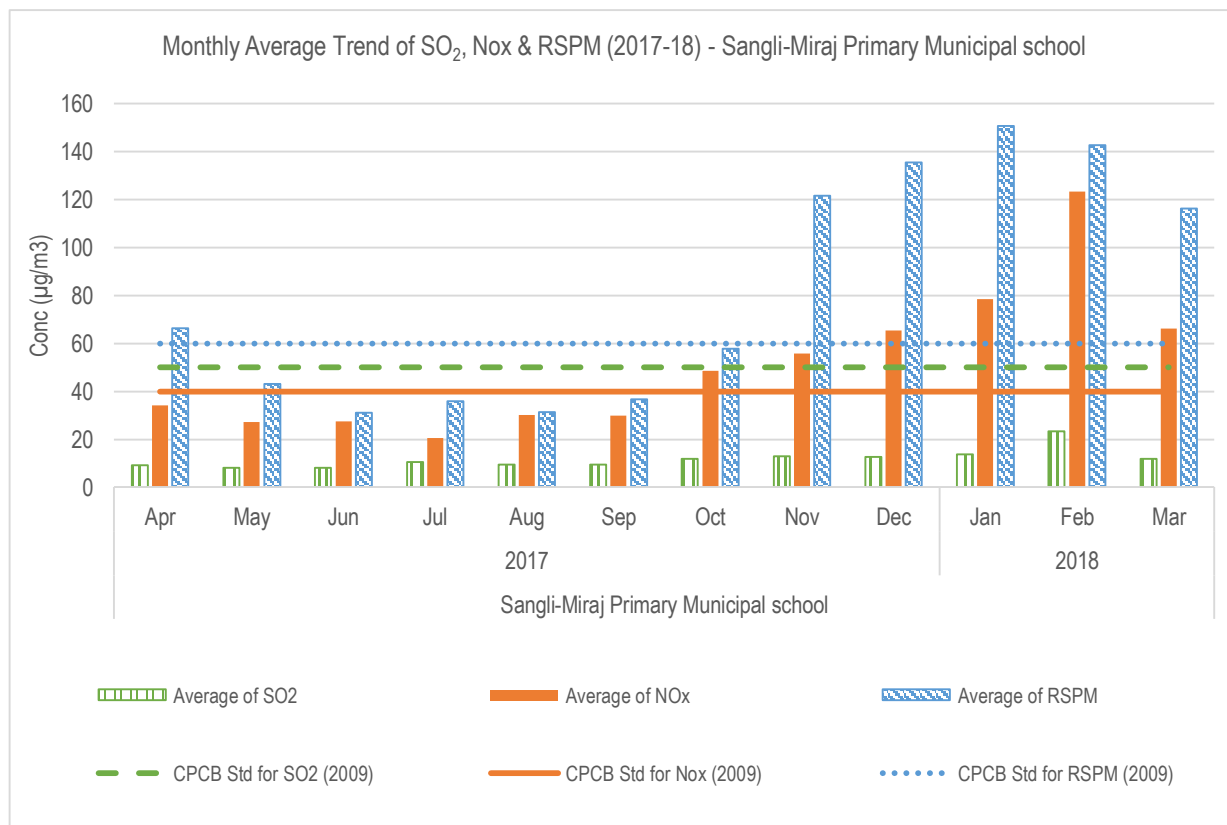


Figure No. 99: Monthly average reading recorded at Sangli - Miraj Primary Municipal School

Table No. 95: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Sangli - Miraj Primary Municipal School

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Sangli-Miraj Primary Municipal school	08-09	22	23	87
	09-10	23	32	68
	10-11	13	32	69
	11-12	10	36	72
	12-13	11	44	79
	13-14	9	40	74
	14-15	13	48	91
	15-16	11	44	77
	16-17	9	44	72
	17-18	12	50	81

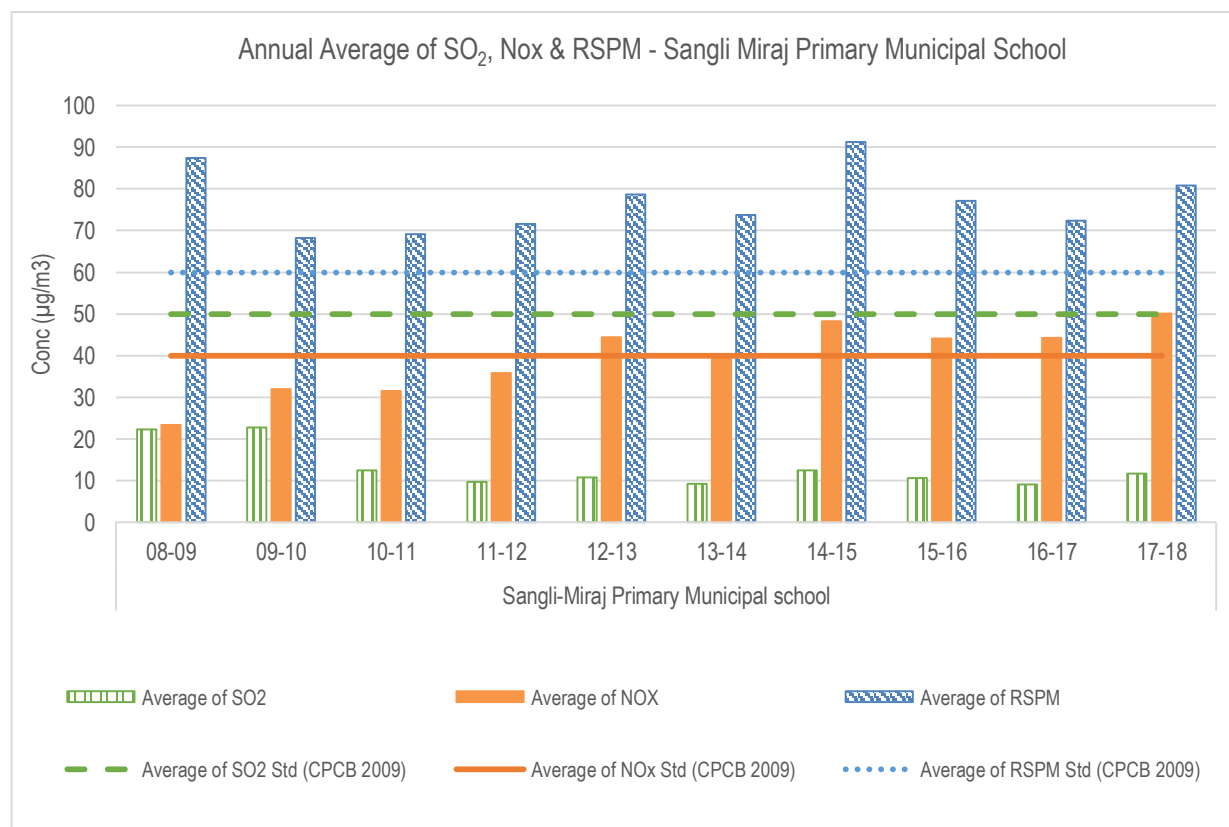


Figure No. 100: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Sangli - Miraj Primary Municipal School



## Sangli - Krishna Valley School

Table No. 96: Data for Monthly average reading recorded at Krishna Valley School

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Krishna Valley school	2017	Apr	10	40	78
		May	9	36	54
		Jun	9	29	38
		Jul	9	24	42
		Aug	9	31	43
		Sep	9	25	54
		Oct	12	42	51
		Nov	11	58	117
		Dec	13	55	122
	2018	Jan	14	48	134
		Feb	14	52	104
		Mar	11	44	126

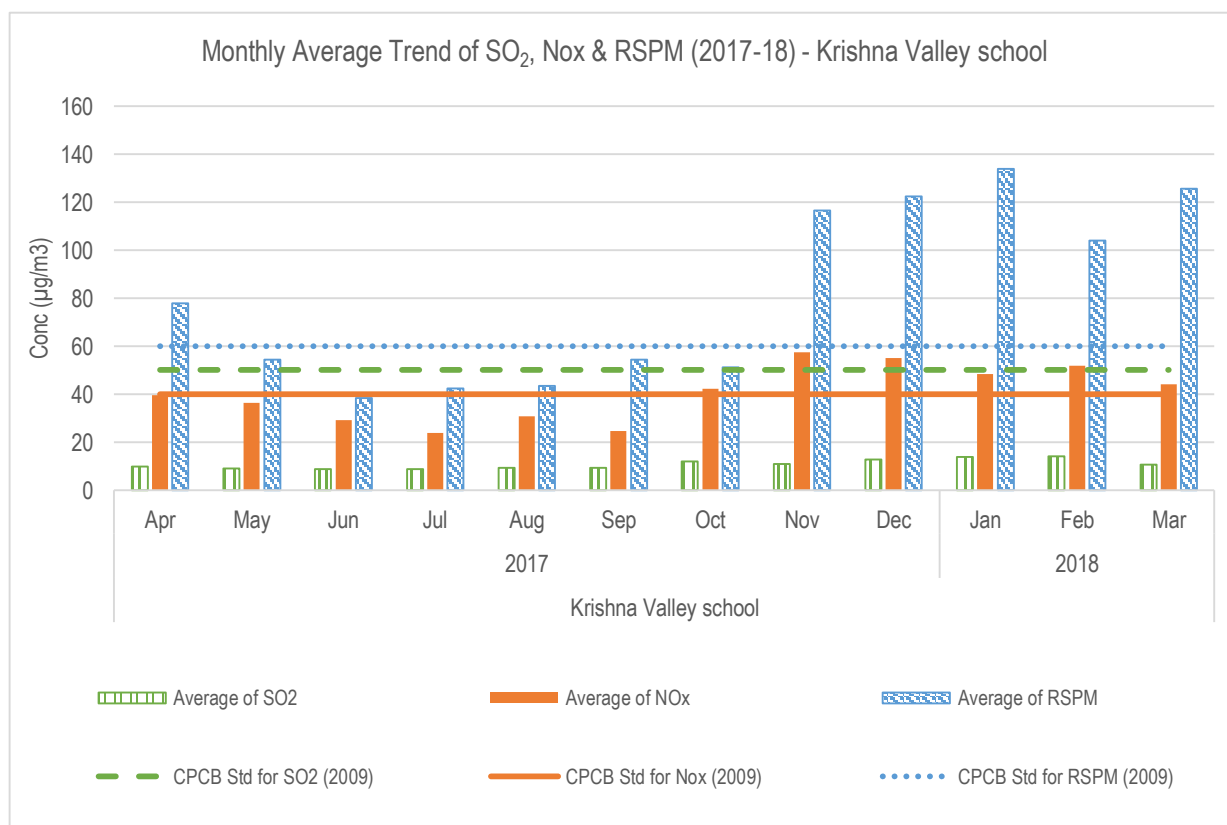
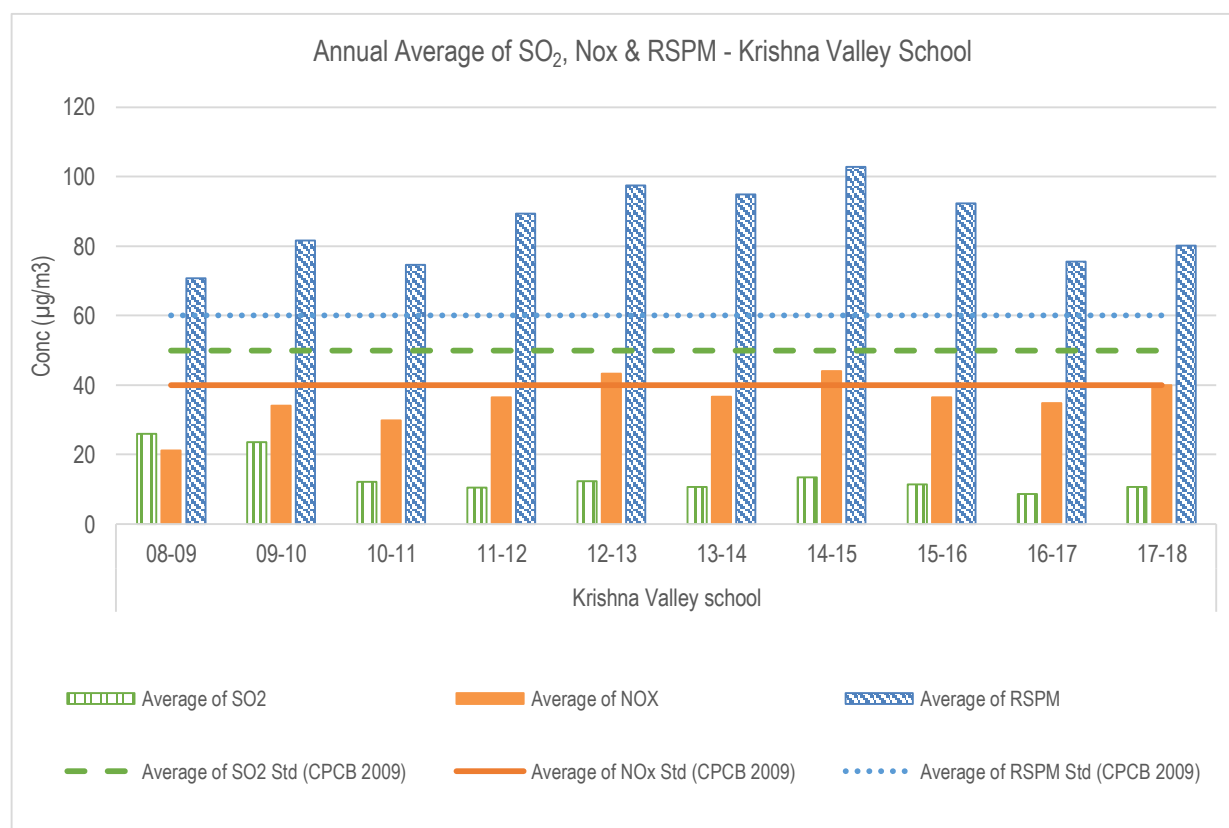


Figure No. 101: Monthly average reading recorded at Krishna Valley School

**Table No. 97: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Krishna Valley School**

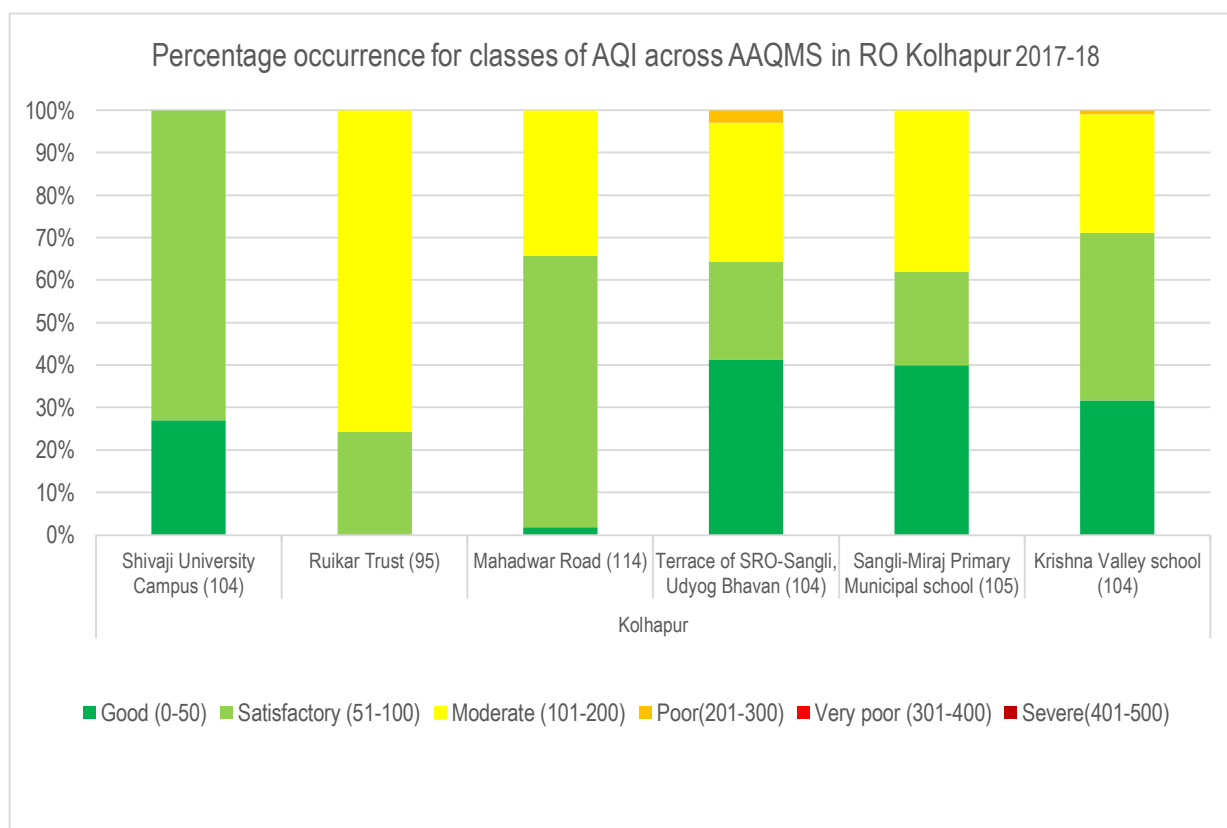
Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Krishna Valley school	08-09	26	21	71
	09-10	24	34	82
	10-11	12	30	75
	11-12	10	36	89
	12-13	12	43	97
	13-14	11	37	95
	14-15	13	44	103
	15-16	11	37	92
	16-17	9	35	76
	17-18	11	40	80



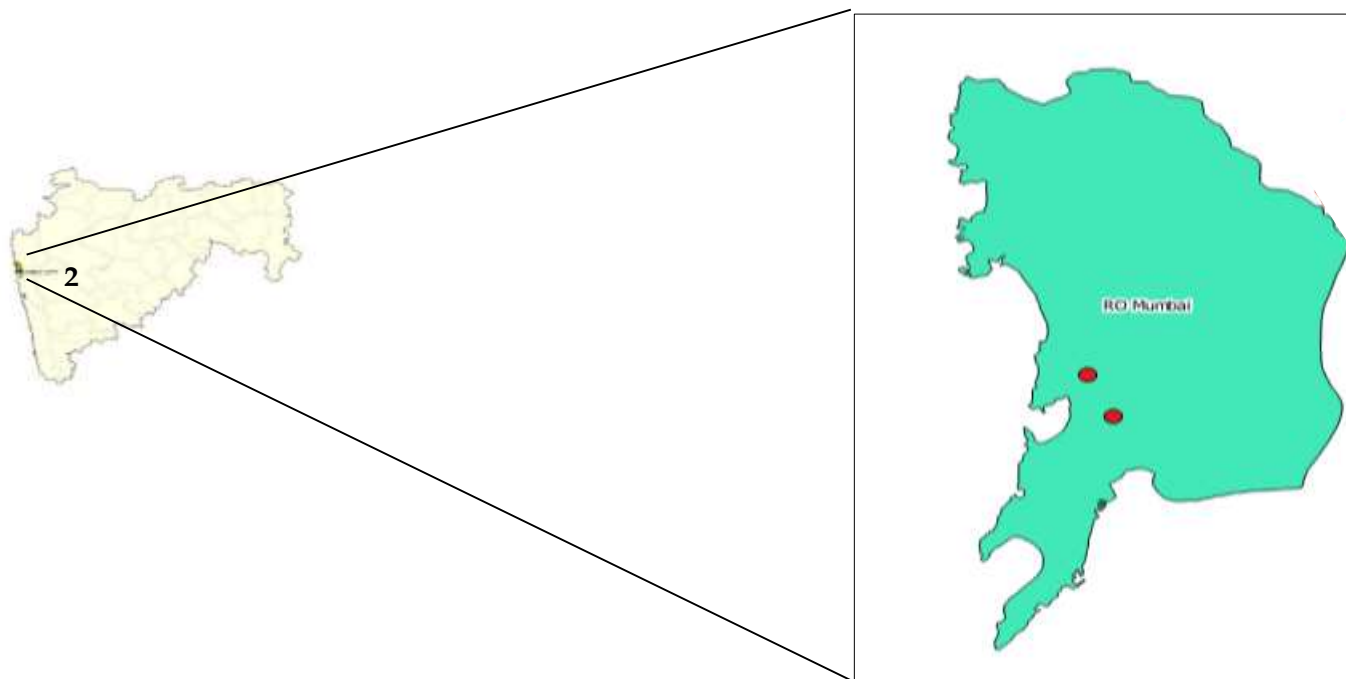
**Figure No. 102: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Krishna Valley School**

**Table No. 98: Percentage exceedance of pollutants at Kolhapur RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Shivaji University Campus	104	0	0	0	0	0	0
Ruikar Trust	95	0	1	72	0	1	76
Mahadwar Road	114	0	0	39	0	0	34
Terrace of SRO-Sangli, Udyog Bhavan	104	0	2	37	0	2	36
Sangli-Miraj Primary Municipal school	105	0	17	40	0	16	38
Krishna Valley school	104	0	2	30	0	2	29



## RO - Mumbai



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Mumbai	Mumbai		Bandra	Residential	19° 03' 47.1" N	72° 50' 47.2" E
	Mumbai	441	Sion	Residential	19° 02' 07.9" N	72° 51' 35.3" E

## Mumbai - Bandra

Table No. 99: Data for Monthly average reading recorded at Bandra

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Bandra	2017	Apr	13	40	102
		May	11	36	62
		Jun	10	51	53
		Jul	7	29	59
		Aug	9	26	48
		Sep	13	23	66
		Oct	17	39	105
		Nov	13	29	152
		Dec	12	75	164
	2018	Jan	17	93	179
		Feb	24	86	180
		Mar	24	65	116

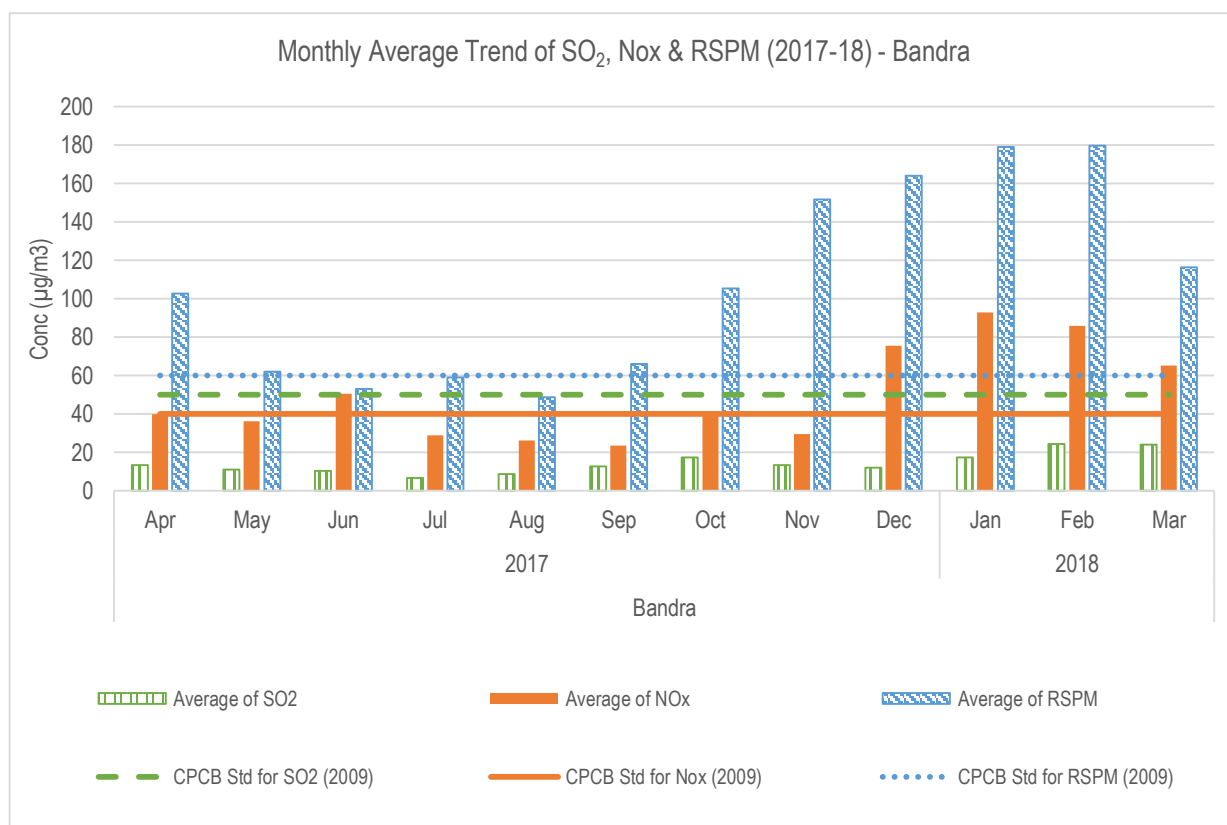


Figure No. 103: Monthly average reading recorded at Bandra

Table No. 100: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Bandra

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Bandra	07-08	19	59	158
	08-09	19	60	137
	09-10	17	90	140
	10-11	19	48	116
	11-12	21	65	131
	12-13	18	48	116
	13-14	20	49	106
	14-15	16	52	114
	15-16	18	49	93
	16-17	13	40	122
	17-18	14	49	106

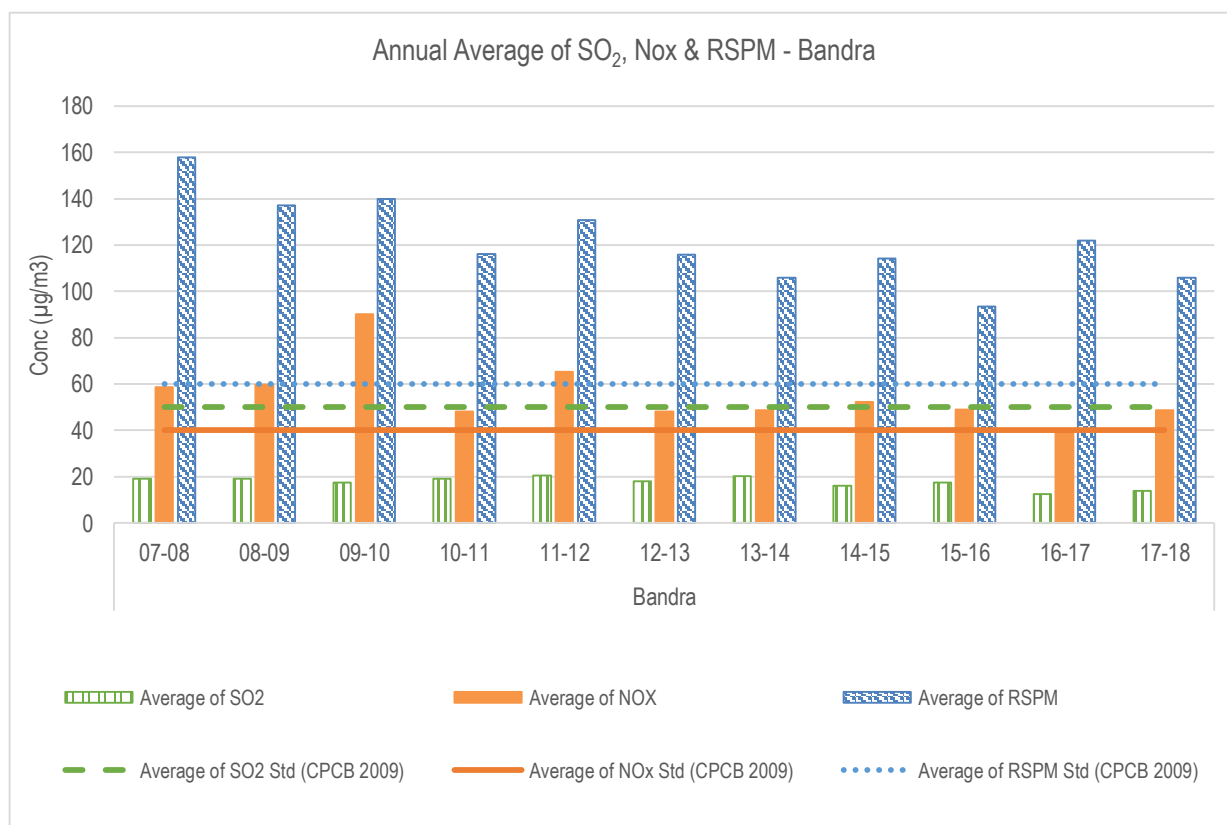


Figure No. 104: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Bandra

## Mumbai - Sion

Table No. 101: Data for Monthly average reading recorded at Sion

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Sion	2017	Apr	7	71	187
		May	7	61	178
		Jun	6	64	114
		Jul	8	59	97
		Aug	10	63	112
		Sep	10	75	81
		Oct	3	90	103
		Nov	4	94	183
		Dec	4	92	159
	2018	Jan	4	97	171
		Feb	7	89	183
		Mar	4	64	168

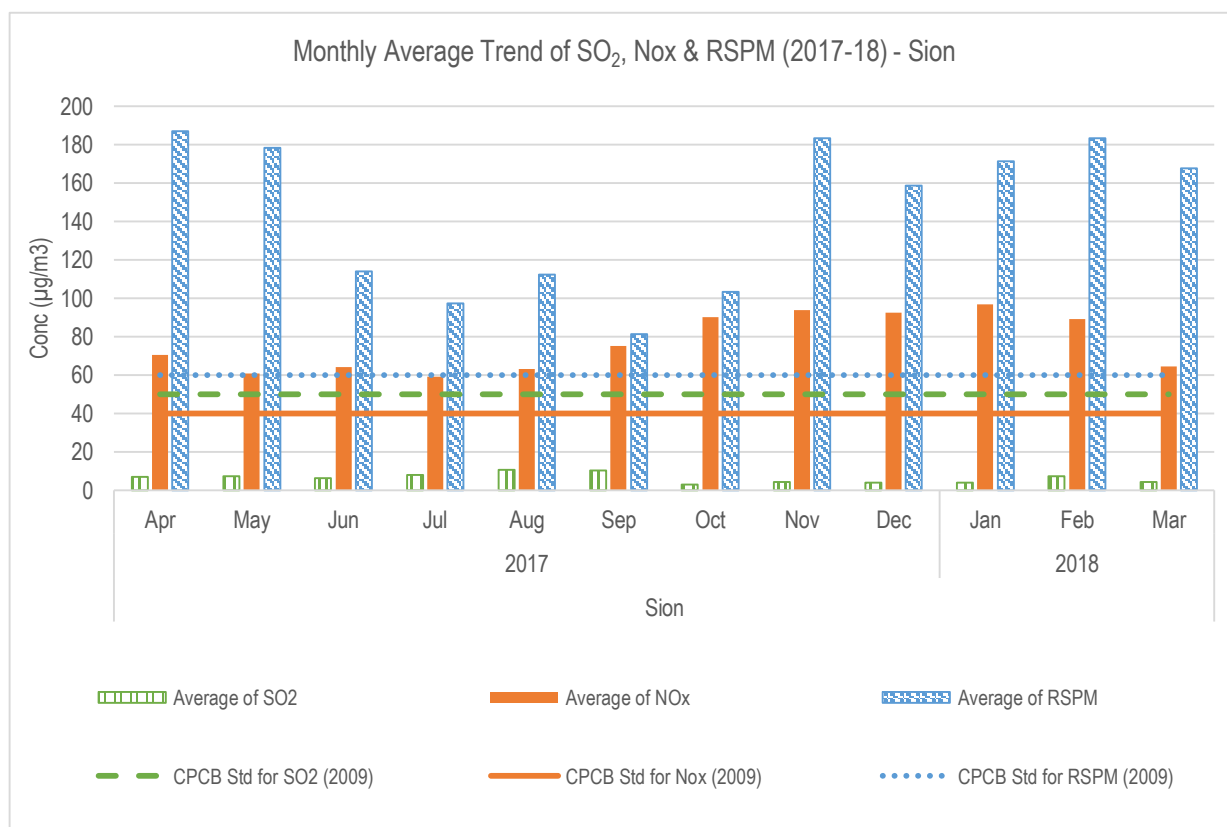


Figure No. 105: Monthly average reading recorded at Sion

Table No. 102: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Sion

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Sion	04-05	21	67	197
	05-06	26	105	231
	06-07	30	91	255
	07-08	28	139	295
	08-09	24	97	202
	09-10	18	109	223
	10-11	14	116	181
	11-12	10	66	150
	12-13	11	106	136
	13-14	8	108	131
	14-15	8	91	117
	15-16	14	81	148
	16-17	8	83	149
	17-18	6	77	148

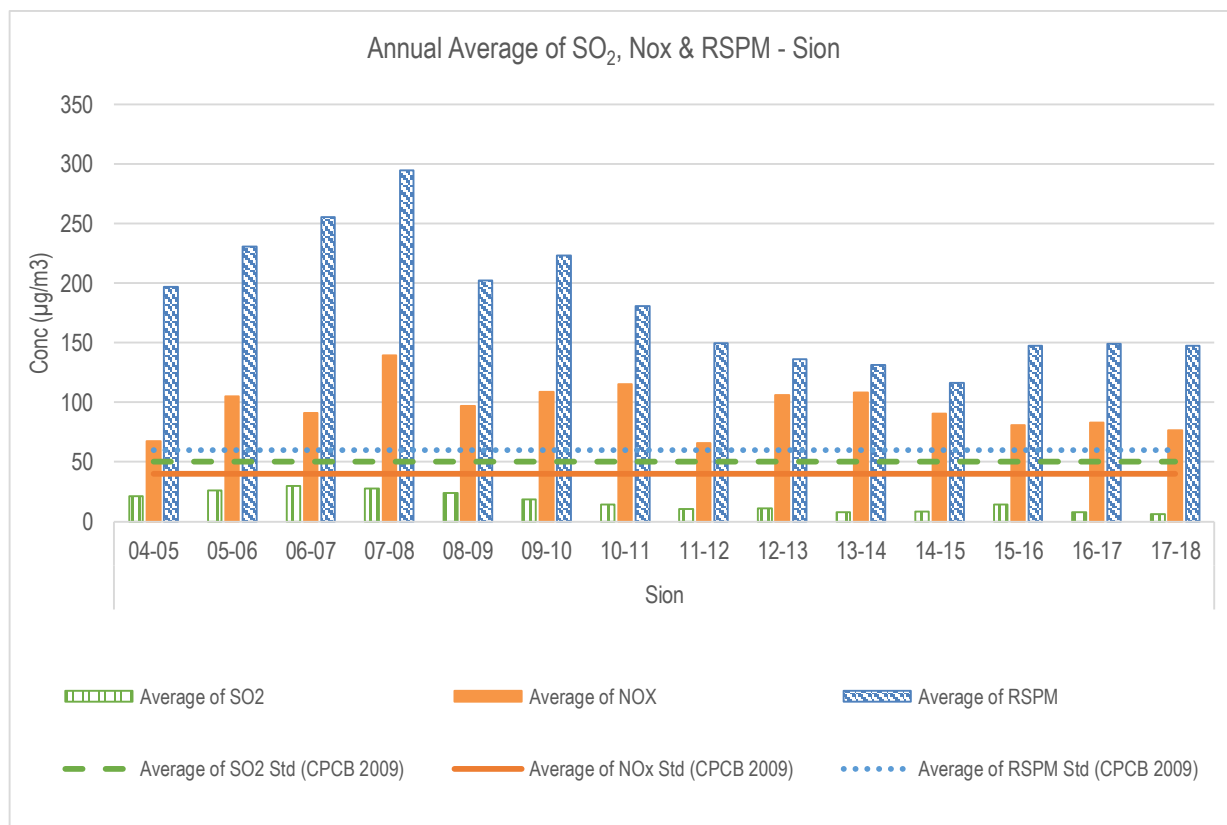
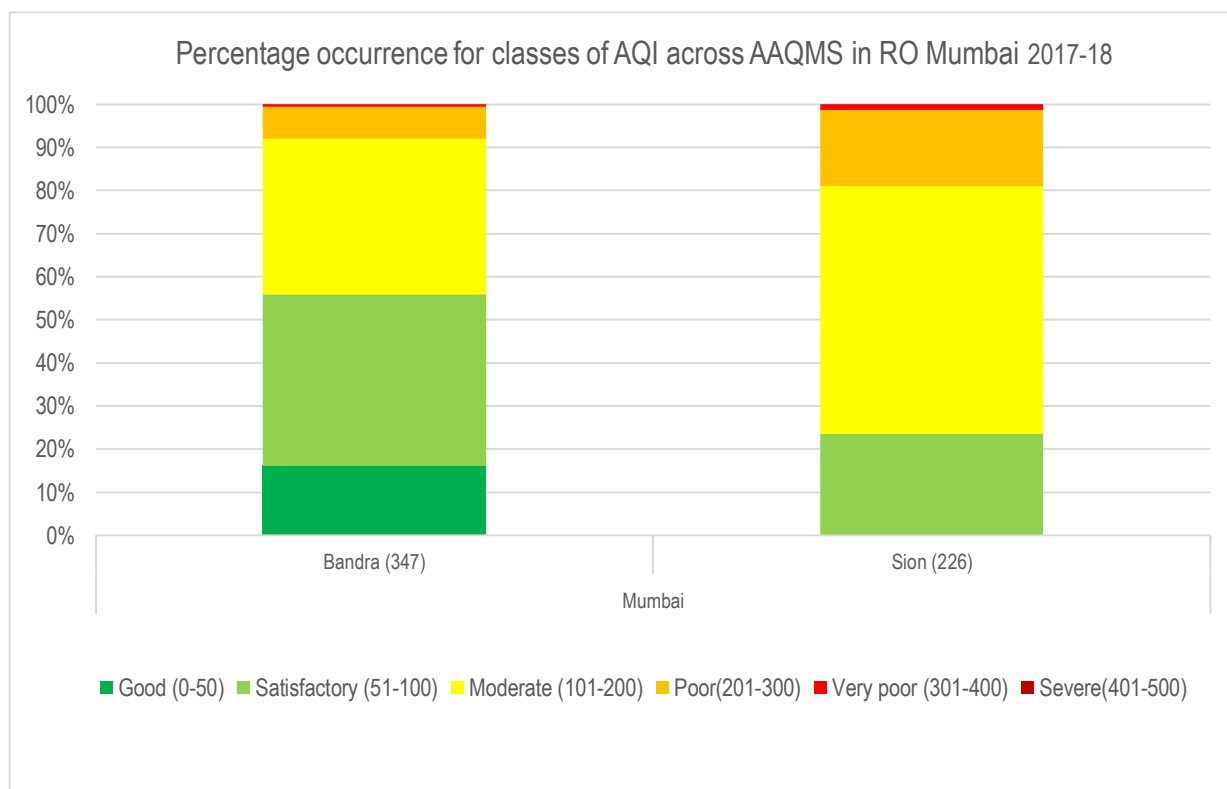


Figure No. 106: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Sion

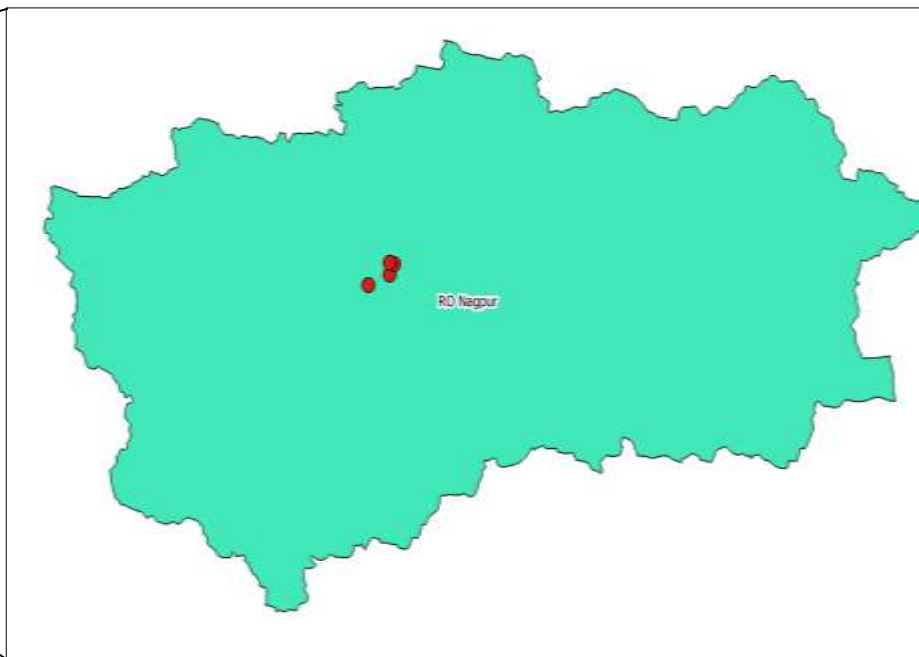
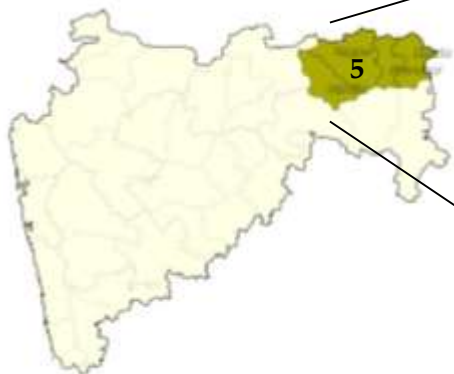


**Table No. 103: Percentage exceedance of pollutants at Mumbai RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
<b>Bandra</b>	347	0	53	151	0	15	44
<b>Sion</b>	226	0	88	165	0	39	73



## RO – Nagpur



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Nagpur	Nagpur	287	IOE North Ambazari road	Residential	21° 08' 10.0" N	79° 04' 08.5" E
	Nagpur	288	MIDC Office, Hingna Road	Industrial	21° 06' 35.5" N	79° 00' 27.2" E
	Nagpur	314	Govt Polytechnic Col, Sadar	Rural and other areas	21° 09' 47.6" N	79° 04' 57.6" E
	Nagpur	711	Civil lines Nagpur	Residential	21° 09' 28.6" N	79° 04' 12.1" E
	Nagpur		Nagpur CAAQMS	Commercial	21° 09'03.61"N	79° 04' 06.00"E

## Nagpur - IOE North Ambazari road

Table No. 104: Data for Monthly average reading recorded at IOE North Ambazari road

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
IOE North Ambazari road	2017	Apr	10	32	91
		May	9	28	89
		Jun	10	30	88
		Jul	7	23	81
		Aug	9	24	82
		Sep	9	28	86
		Oct	11	35	110
		Nov	12	39	111
		Dec	13	41	108
	2018	Jan	13	41	114
		Feb	14	43	90
		Mar	11	39	86

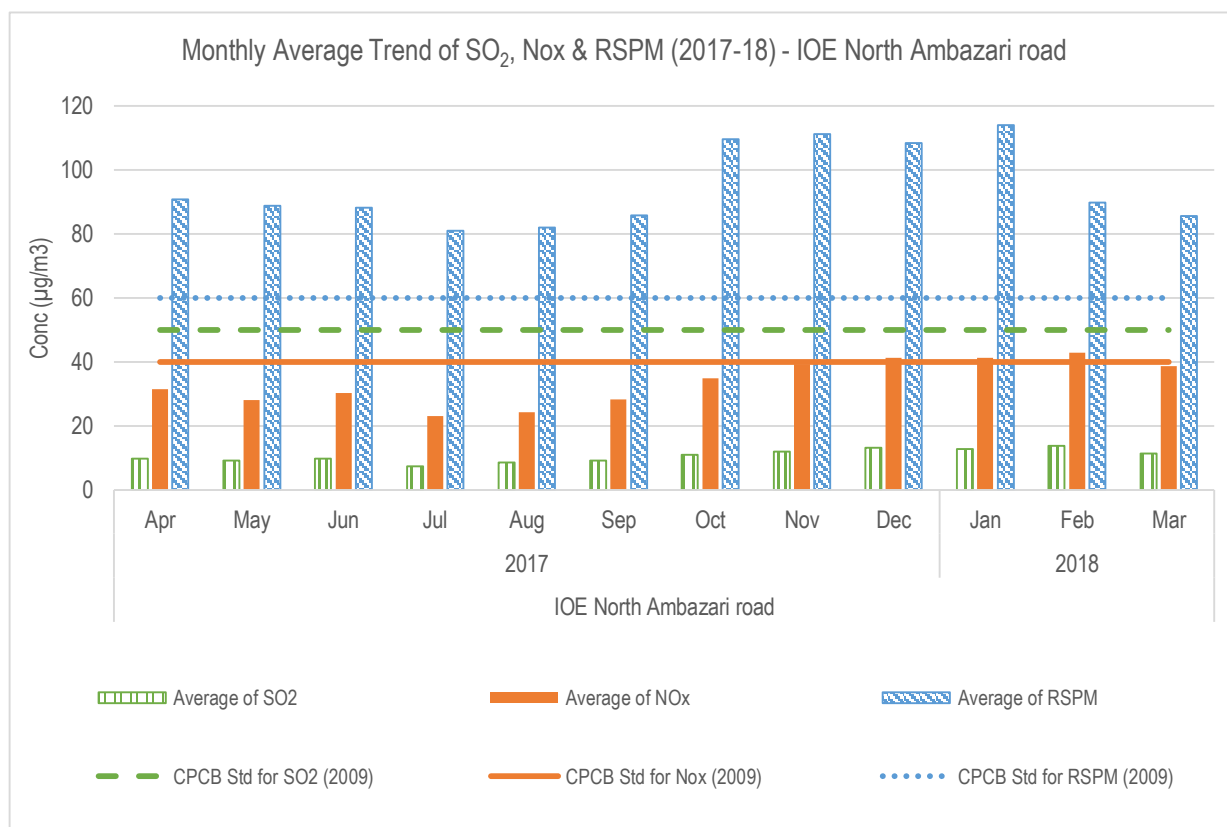


Figure No. 107: Monthly average reading recorded at IOE North Ambazari road

Table No. 105: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at IOE North Ambazari road

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
IOE North Ambazari road	04-05	8	21	52
	05-06	9	30	44
	06-07	10	27	66
	07-08	8	22	125
	08-09	8	30	114
	09-10	10	36	109
	10-11	10	33	96
	11-12	10	34	84
	12-13	11	39	96
	13-14	10	29	90
	14-15	10	32	106
	15-16	10	31	101
	16-17	10	31	92
	17-18	11	33	95

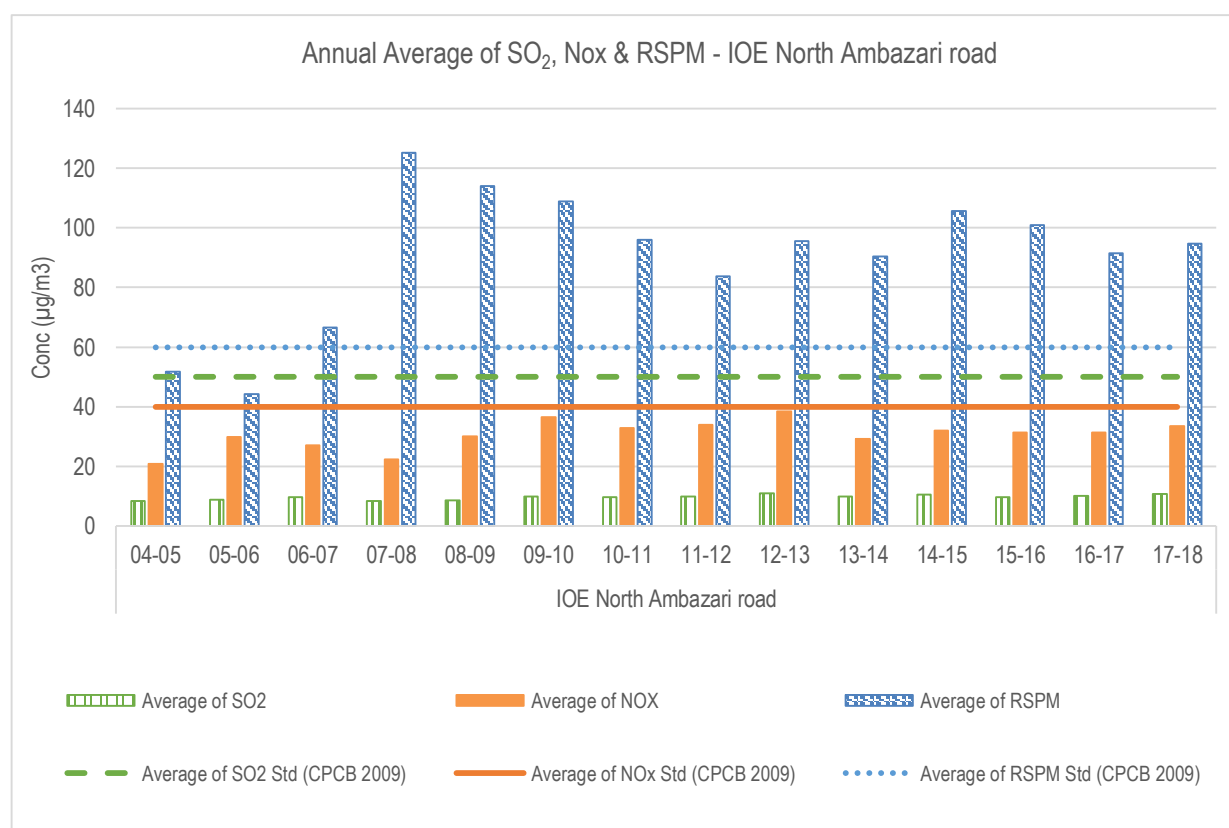


Figure No. 108: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at IOE North Ambazari road

## Nagpur - MIDC Office, Hingna Road

Table No. 106: Data for Monthly average reading recorded at MIDC Office, Hingna Road

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
MIDC Office, Hingna Road	2017	Apr	10	30	87
		May	10	30	87
		Jun	9	26	76
		Jul	8	24	71
		Aug	8	24	96
		Sep	9	28	94
		Oct	11	36	121
		Nov	14	43	120
		Dec	14	42	116
	2018	Jan	14	43	120
		Feb	13	41	102
		Mar	12	39	85

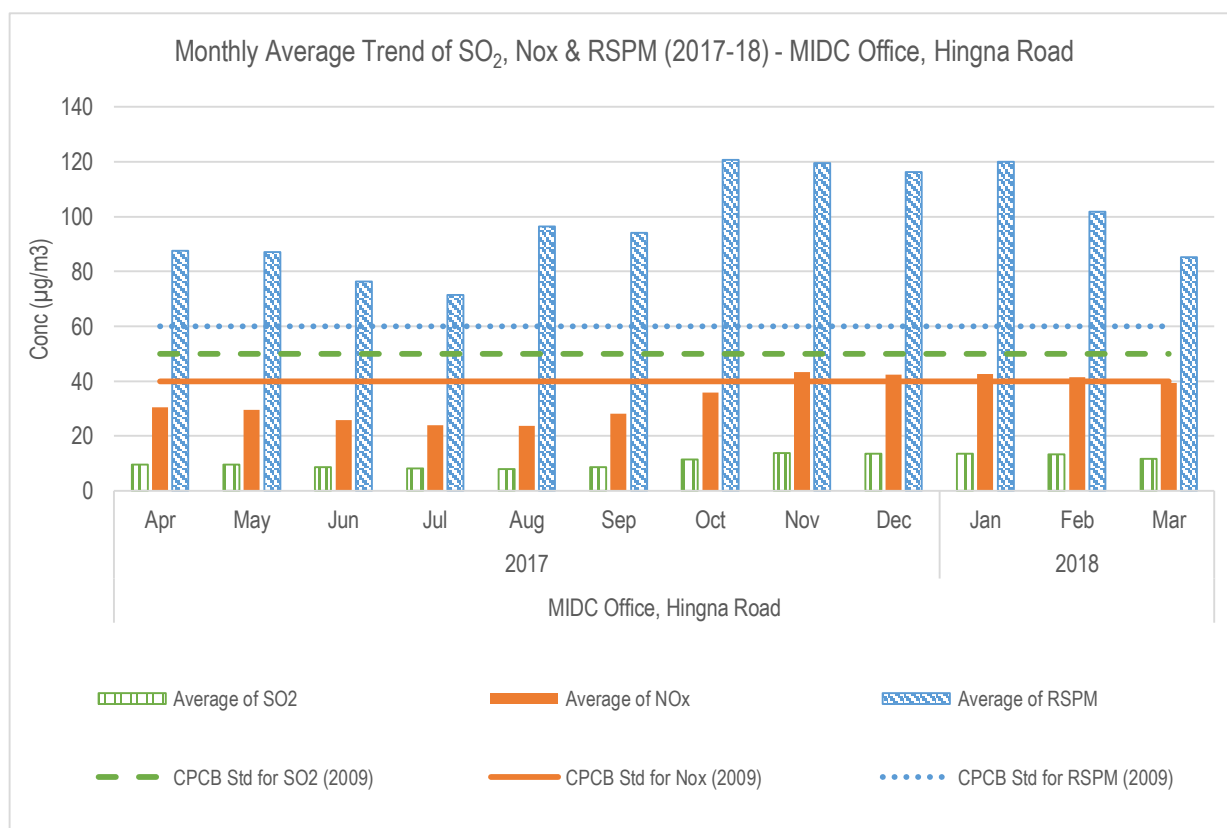


Figure No. 109: Monthly average reading recorded at MIDC Office, Hingna Road

Table No. 107: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Office, Hingna Road

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
MIDC Office, Hingna Road	04-05	9	22	51
	05-06	10	34	40
	06-07	9	25	90
	07-08	9	24	160
	08-09	9	30	118
	09-10	10	38	128
	10-11	10	34	113
	11-12	10	35	105
	12-13	11	41	125
	13-14	10	31	119
	14-15	11	33	129
	15-16	10	32	110
	16-17	10	33	101
	17-18	11	34	98

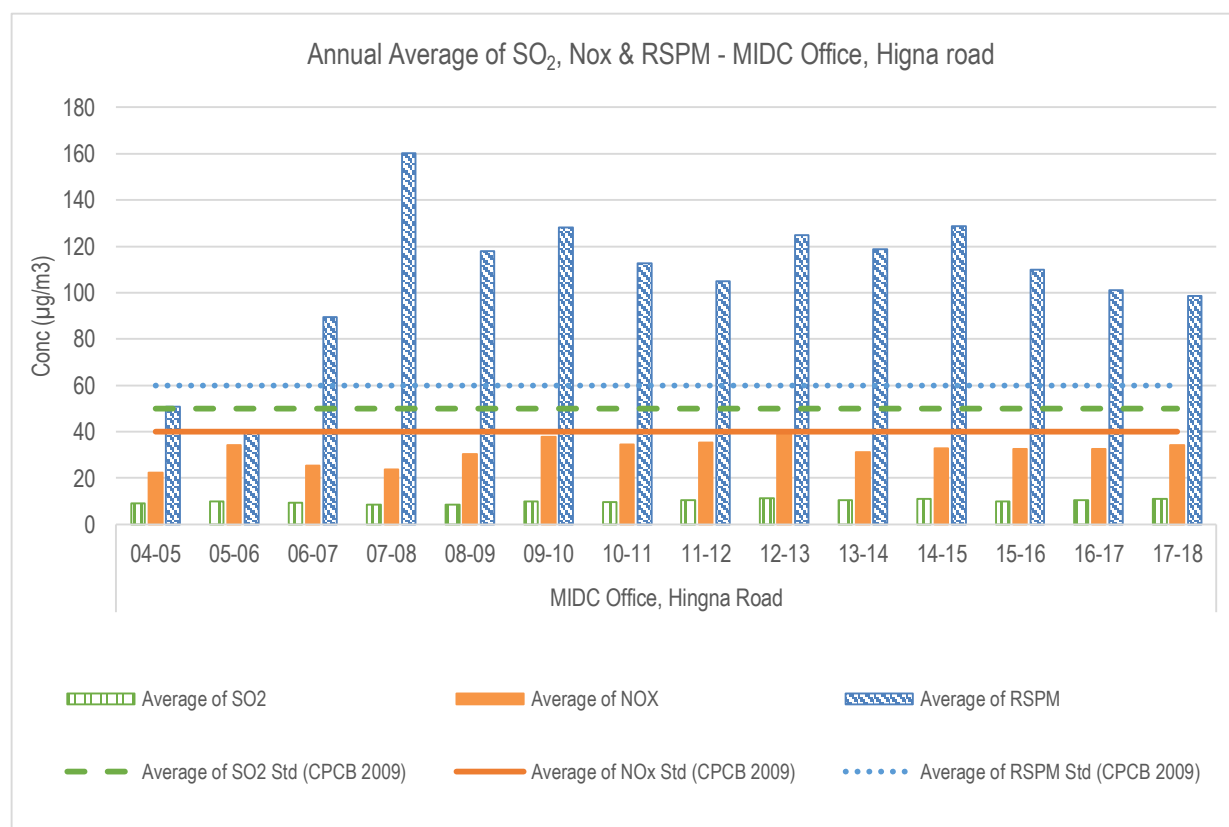


Figure No. 110: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Office, Hingna Road

## Nagpur - Govt. Polytechnic Col, Sadar

Table No. 108: Data for Monthly average reading recorded at Govt. Polytechnic Col, Sadar

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Govt Polytechnic Col, Sadar	2017	Apr	11	52	83
		May	8	25	90
		Jun	8	24	90
		Jul	8	24	74
		Aug	8	22	84
		Sep	9	25	85
		Oct	11	35	115
		Nov	11	37	105
		Dec	13	41	114
	2018	Jan	13	41	103
		Mar	11	37	70

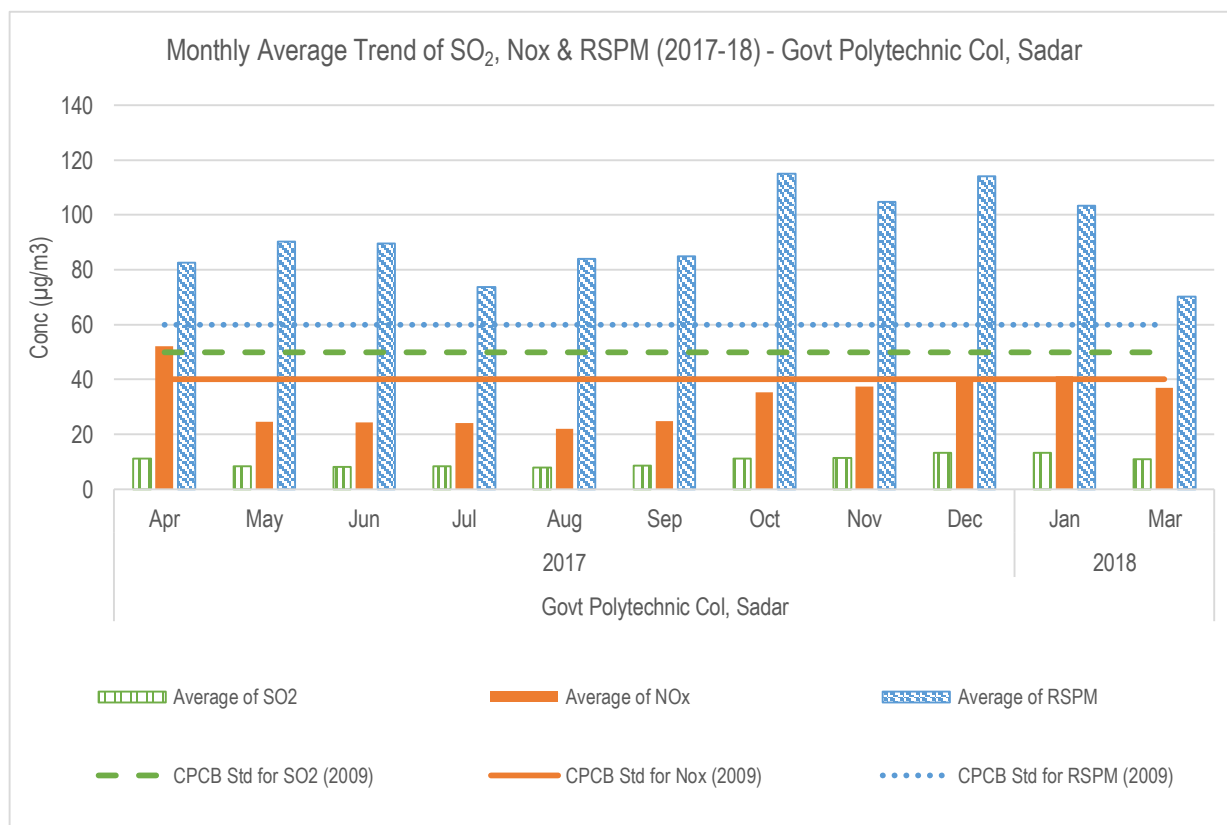


Figure No. 111: Monthly average reading recorded at Govt. Polytechnic Col, Sadar

Table No. 109: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Govt. Polytechnic Col, Sadar

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Govt Polytechnic Col, Sadar	04-05	9	21	45
	05-06	9	32	52
	06-07	9	26	70
	07-08	8	21	107
	08-09	8	27	101
	09-10	9	31	93
	10-11	9	30	87
	11-12	9	30	80
	12-13	10	35	82
	13-14	9	28	92
	14-15	10	31	103
	15-16	10	33	91
	16-17	10	30	93
	17-18	10	34	91

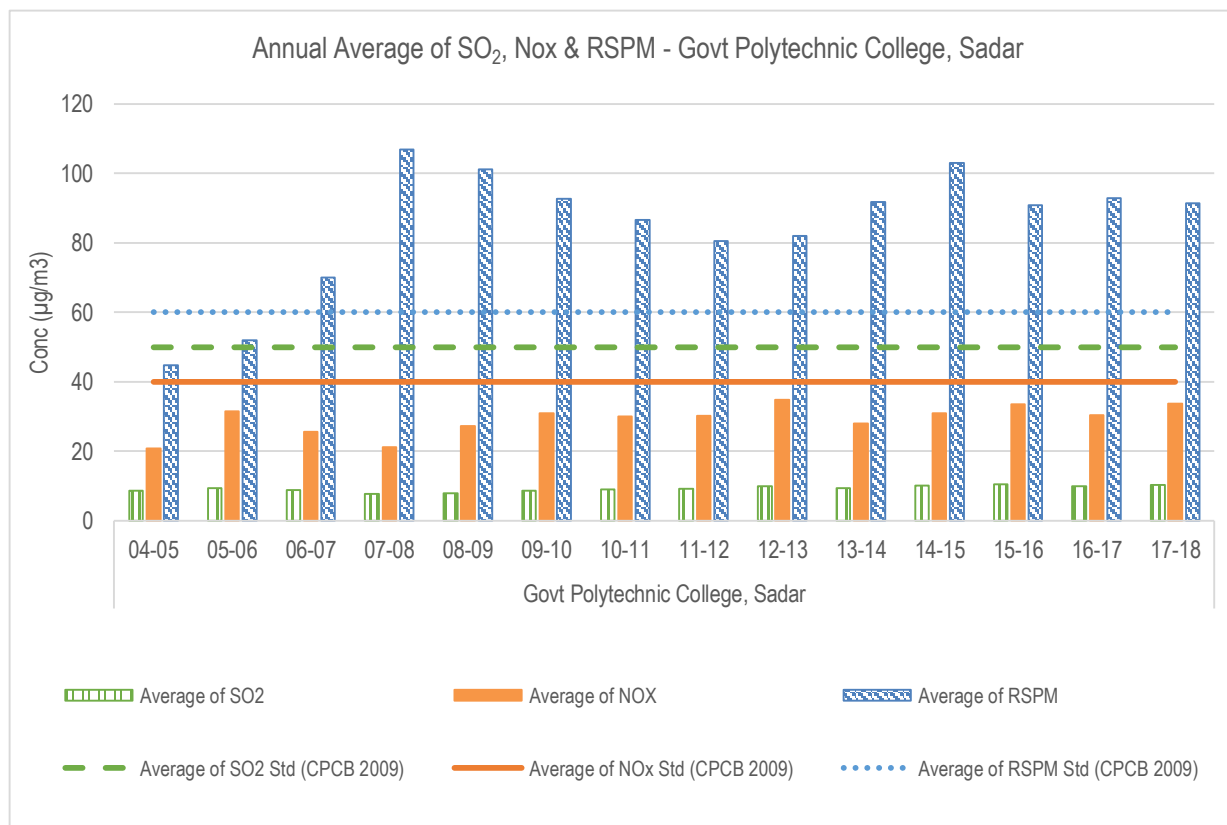


Figure No. 112: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Govt. Polytechnic Col, Sadar



## Nagpur - Nagpur Civil Lines

Table No. 110: Data for Monthly average reading recorded at Civil Lines Nagpur

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Civil lines Nagpur	2017	Apr	8	26	55
		May	8	25	60
		Jun	8	24	52
		Jul	8	22	52
		Aug	8	22	52
		Sep	12	26	53
		Oct	10	32	78
		Nov	11	37	90
		Dec	12	39	72
	2018	Jan	11	38	65
		Feb	12	40	58
		Mar	11	36	54

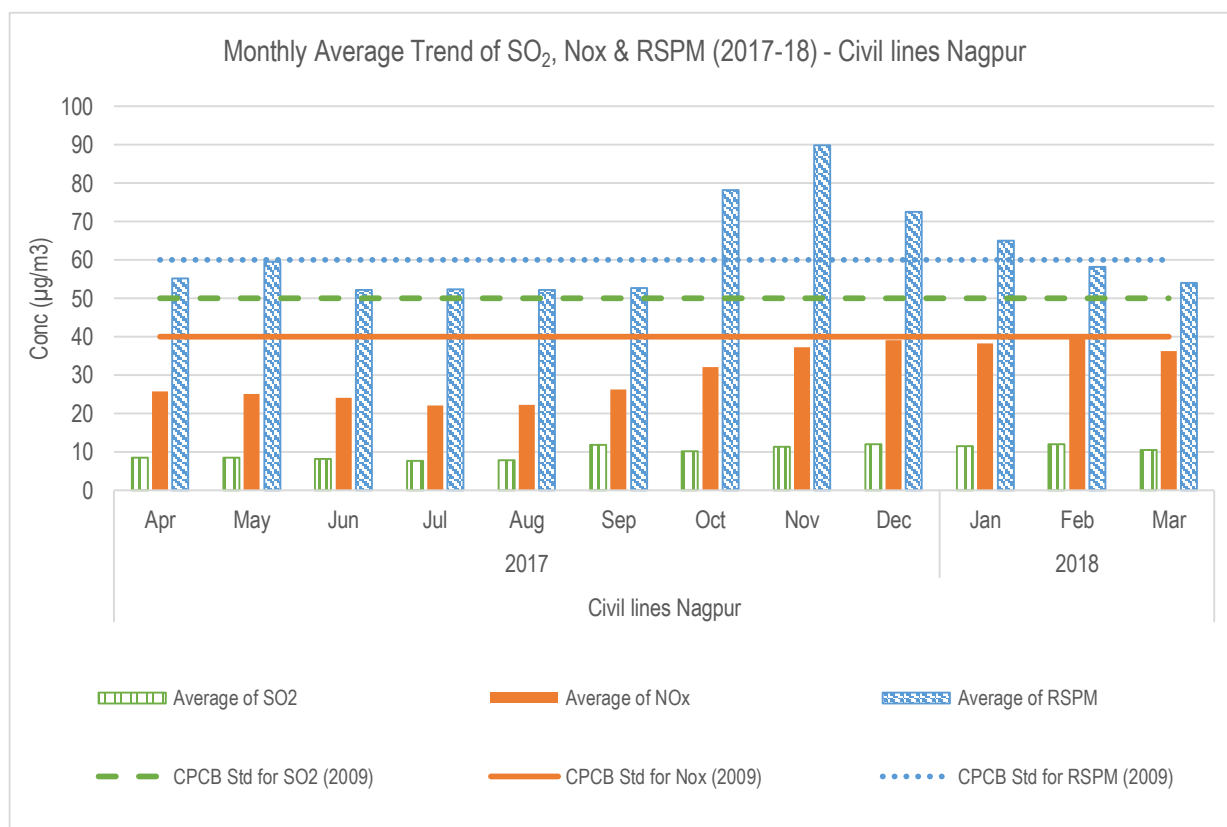
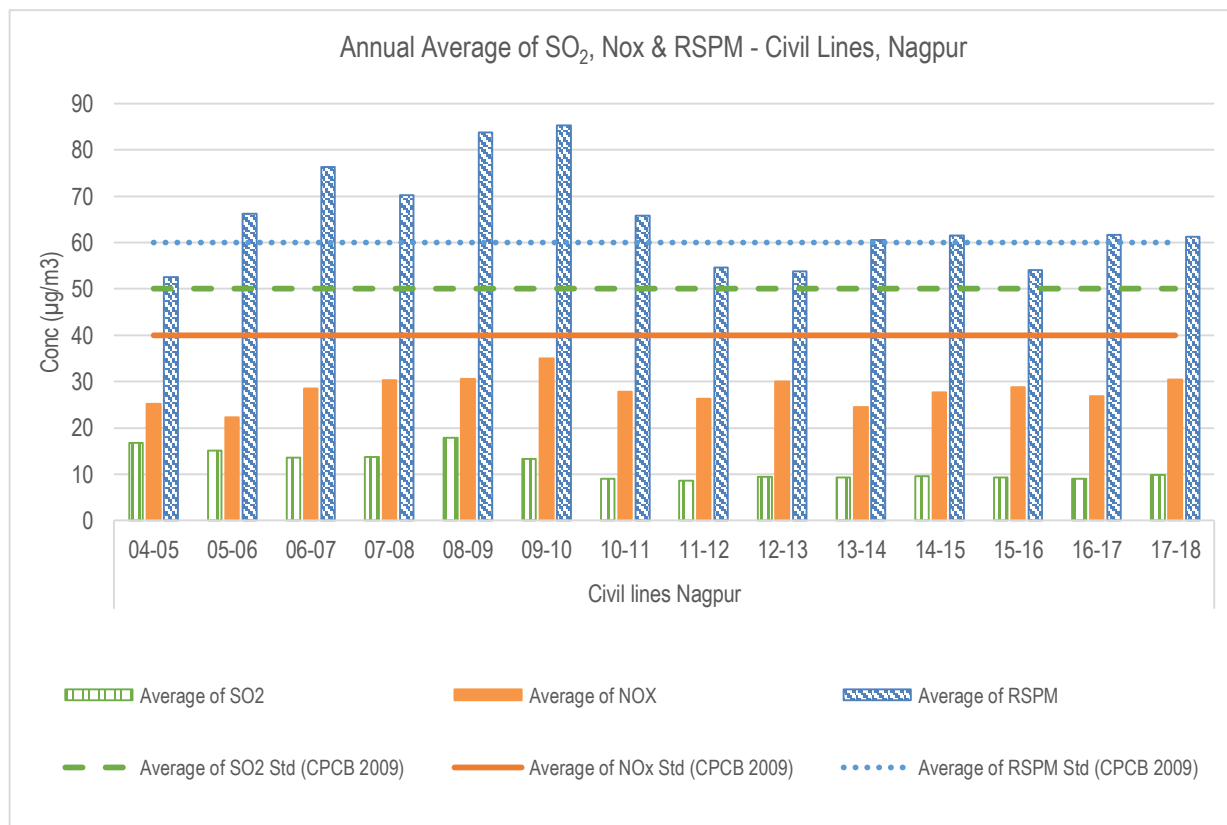


Figure No. 113: Monthly average reading recorded at Civil Lines Nagpur

**Table No. 111: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Civil Lines Nagpur**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Civil lines Nagpur	04-05	17	25	53
	05-06	15	22	66
	06-07	14	28	76
	07-08	14	30	70
	08-09	18	31	84
	09-10	13	35	85
	10-11	9	28	66
	11-12	9	26	55
	12-13	9	30	54
	13-14	9	24	61
	14-15	10	28	62
	15-16	9	29	54
	16-17	9	27	62
	17-18	10	30	61



**Figure No. 114: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Civil Lines Nagpur**

## Nagpur - Nagpur CAAQMS

Table No. 112: Data for Monthly average reading recorded at Nagpur CAAQMS

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Nagpur CAAQMS	2017	Apr	11	15	104
		May	14	14	72
		Jun	4	14	47
		Jul	1	11	57
		Aug	1	10	50
		Sep	3	8	48
		Oct	10	10	65
		Nov	13	25	90
		Dec	12	34	83
	2018	Jan	16	32	79
		Feb	15	31	71
		Mar	16	28	78

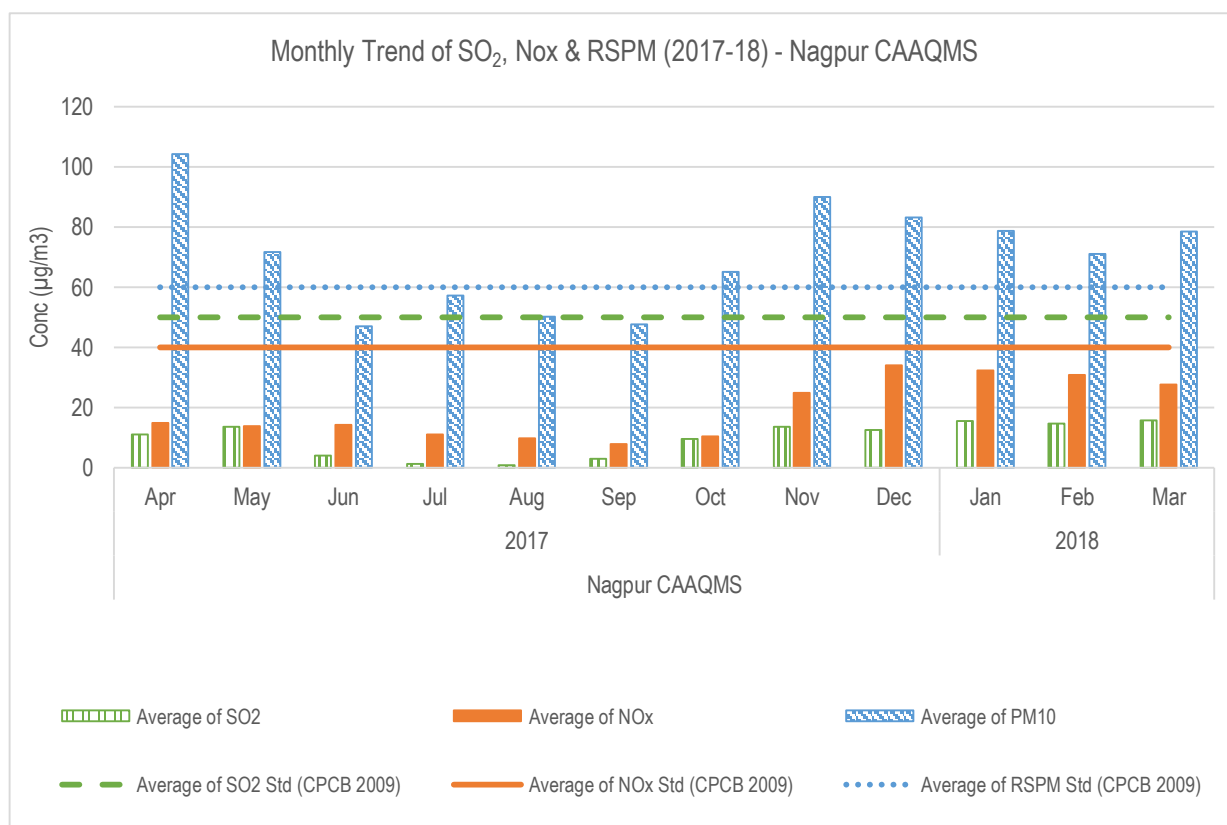


Figure No. 115: Monthly average reading recorded at Nagpur CAAQMS

Table No. 113: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nagpur CAAQMS

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Nagpur CAAQMS	16-17	10	42	71
	17-18	9	19	70

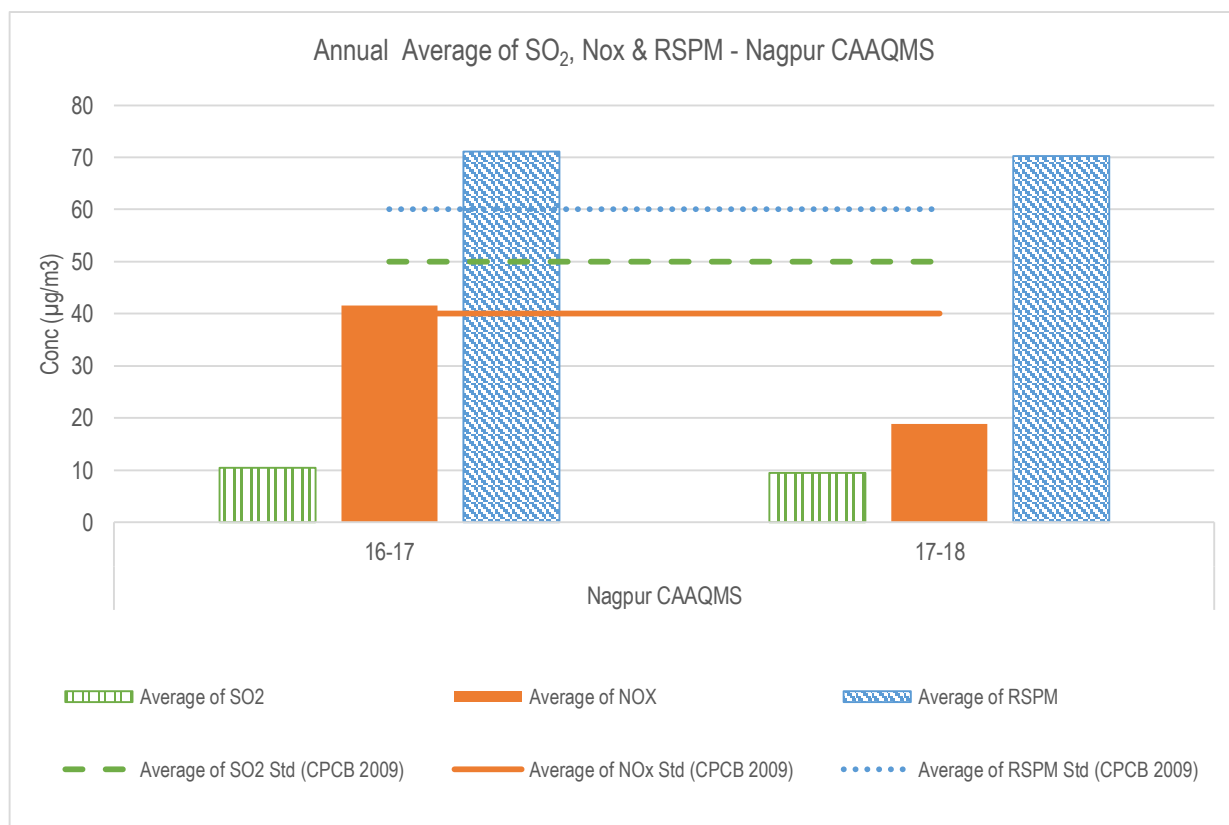
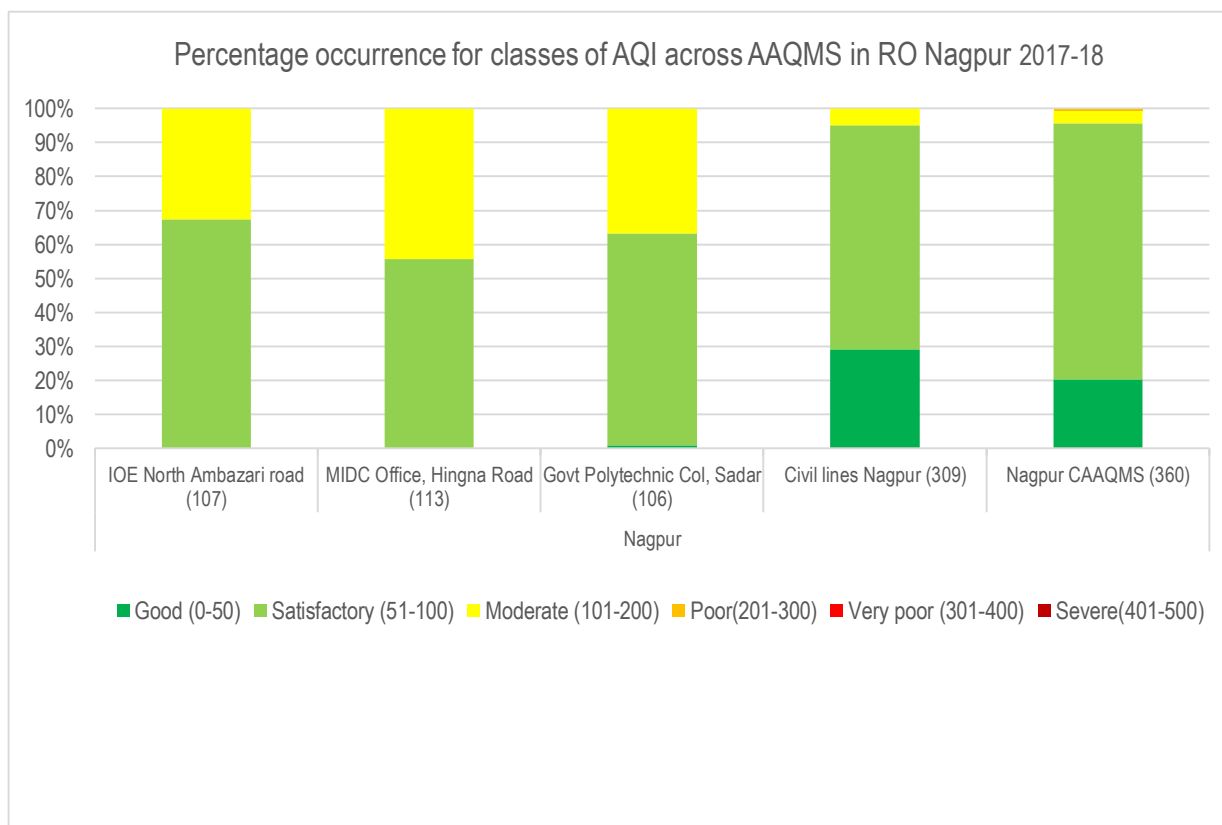


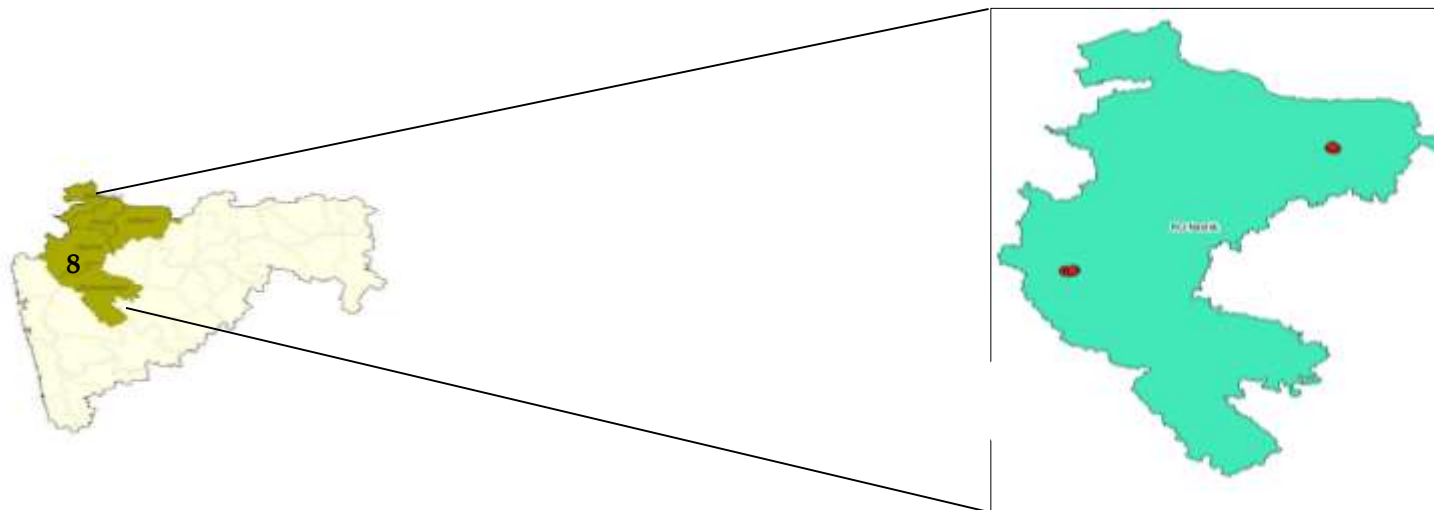
Figure No. 116: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nagpur CAAQMS

**Table No. 114: Percentage exceedance of pollutants at Nagpur RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
IOE North Ambazari road	107	0	0	35	0	0	33
MIDC Office, Hingna Road	113	0	0	50	0	0	44
Govt Polytechnic Col, Sadar	106	0	0	39	0	0	37
Civil lines Nagpur	309	1	0	15	0	0	5
Nagpur CAAQMS	360	0	10	253	0	0	65



## RO - Nashik



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Nashik	Jalgaon	644	Old B. J. Market	Residential	21° 00' 37.2" N	75° 34' 01.4" E
	Jalgaon	645	Girna Water Tank	Residential	20° 59' 49.3" N	75° 33' 04.7" E
	Jalgaon	646	MIDC Jalgaon	Industrial	20° 59' 20.2" N	75° 35' 04.1" E
	Nashik	259	RTO Colony	Residential	19° 59' 48.9" N	73° 46' 35.3" E
	Nashik	269	MIDC Satpur - VIP	Industrial	19° 59' 54.2" N	73° 43' 41.2" E
	Nashik	280	NMC Nashik	Residential	20° 00' 00.0" N	73° 46' 36.2" E
	Nashik	710	SRO Office Nashik	Residential	19° 59' 32.9" N	73° 45' 01.1" E
	Nashik		Nashik CAAQMS	Commercial	20° 00' 26.51" N	73° 46' 42.56" E

### Jalgaon - Old B. J. Market

Table No. 115: Data for Monthly average reading recorded at Old B. J. Market

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM	
			50	40	60	
Old B. J. Market	2017	Apr	14	35	93	
		May	14	34	89	
		Jun	12	33	95	
		Jul	12	34	73	
		Aug	11	26	67	
		Sep	11	26	69	
		Oct	12	26	69	
		Nov	13	28	61	
		Dec	14	30	57	
		2018	Jan	14	34	60
			Feb	13	33	64
			Mar	13	33	71

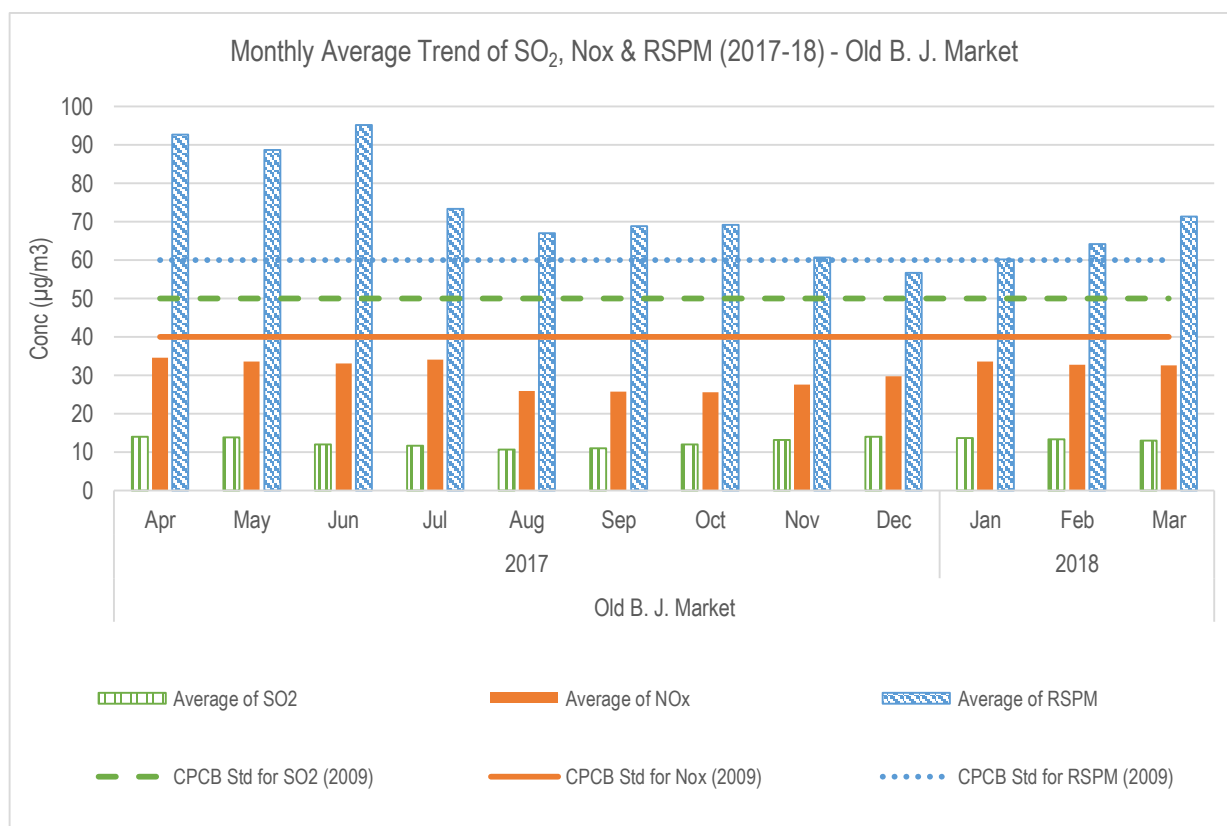


Figure No. 117: Monthly average reading recorded at Old B. J. Market

Table No. 116: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Old B. J. Market

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Old B. J. Market	08-09	14	48	117
	09-10	15	45	109
	10-11	18	45	122
	11-12	16	43	111
	12-13	18	44	123
	13-14	19	41	118
	14-15	18	42	111
	15-16	14	38	108
	16-17	14	36	96
	17-18	13	30	72

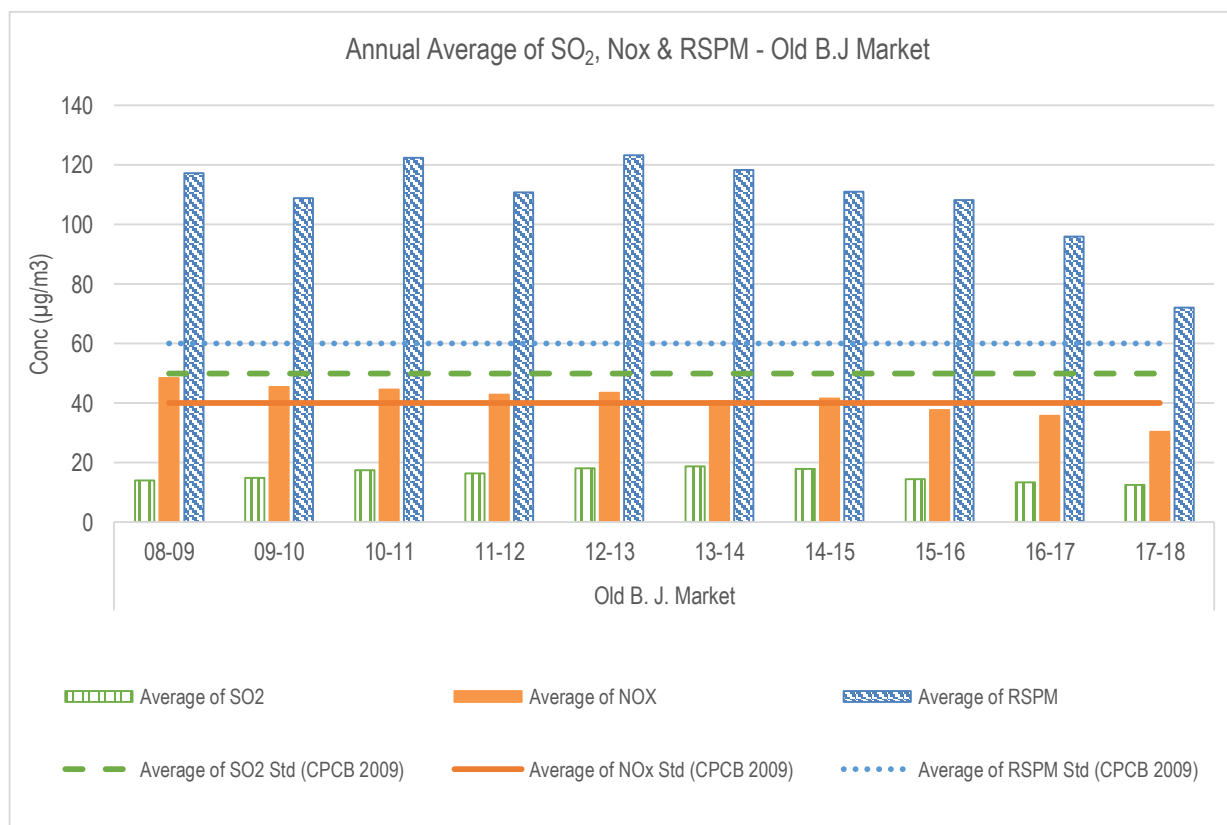


Figure No. 118: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Old B. J. Market



## Jalgaon - Girna Water Tank

Table No. 117: Data for Monthly average reading recorded at Girna Water Tank

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Girna Water Tank	2017	Apr	14	34	89
		May	14	34	82
		Jun	11	32	92
		Jul	11	27	66
		Aug	9	26	64
		Sep	10	23	58
		Oct	12	25	68
		Nov	12	26	61
		Dec	13	28	59
	2018	Jan	13	32	65
		Feb	13	32	65
		Mar	12	33	64

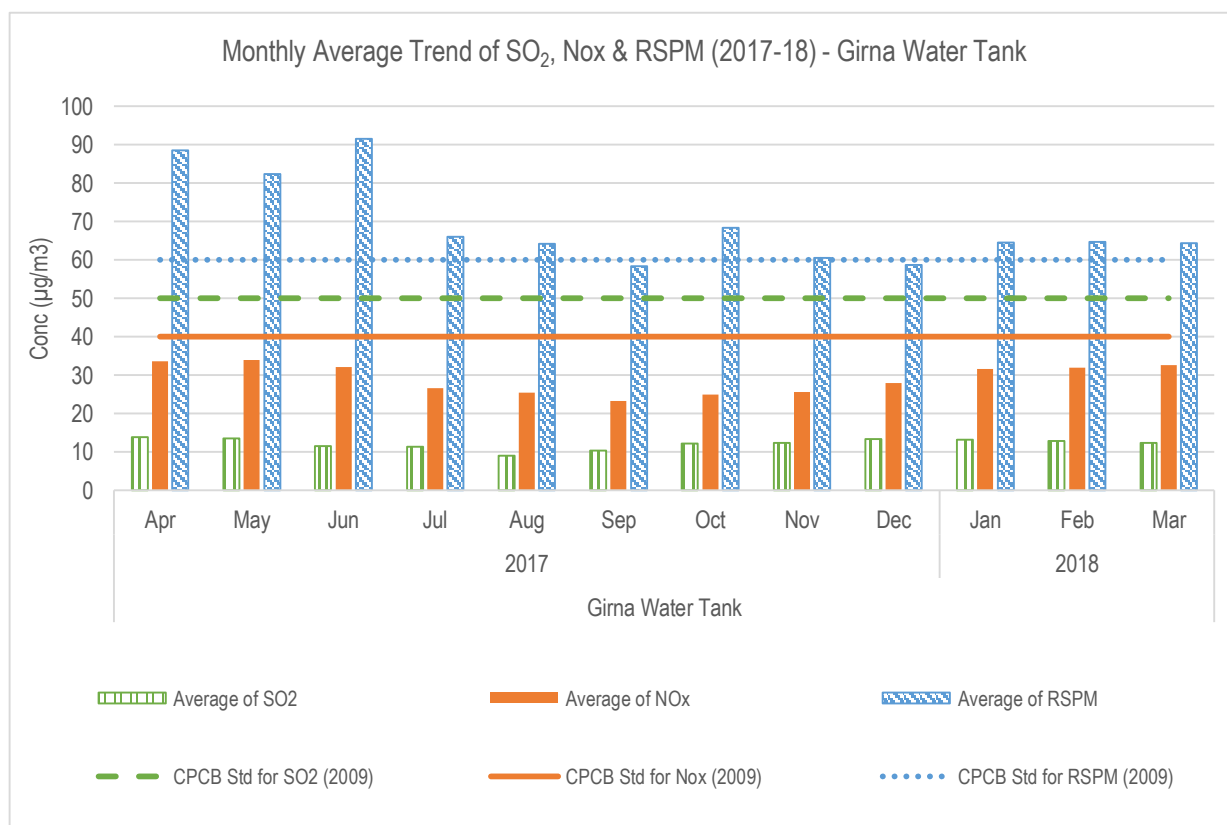


Figure No. 119: Monthly average reading recorded at Girna Water Tank

Table No. 118: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Girna Water Tank

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Girna Water Tank	08-09	11	40	102
	09-10	13	43	110
	10-11	16	42	122
	11-12	13	38	116
	12-13	16	40	124
	13-14	17	37	116
	14-15	16	39	112
	15-16	13	33	103
	16-17	13	34	92
	17-18	12	29	70

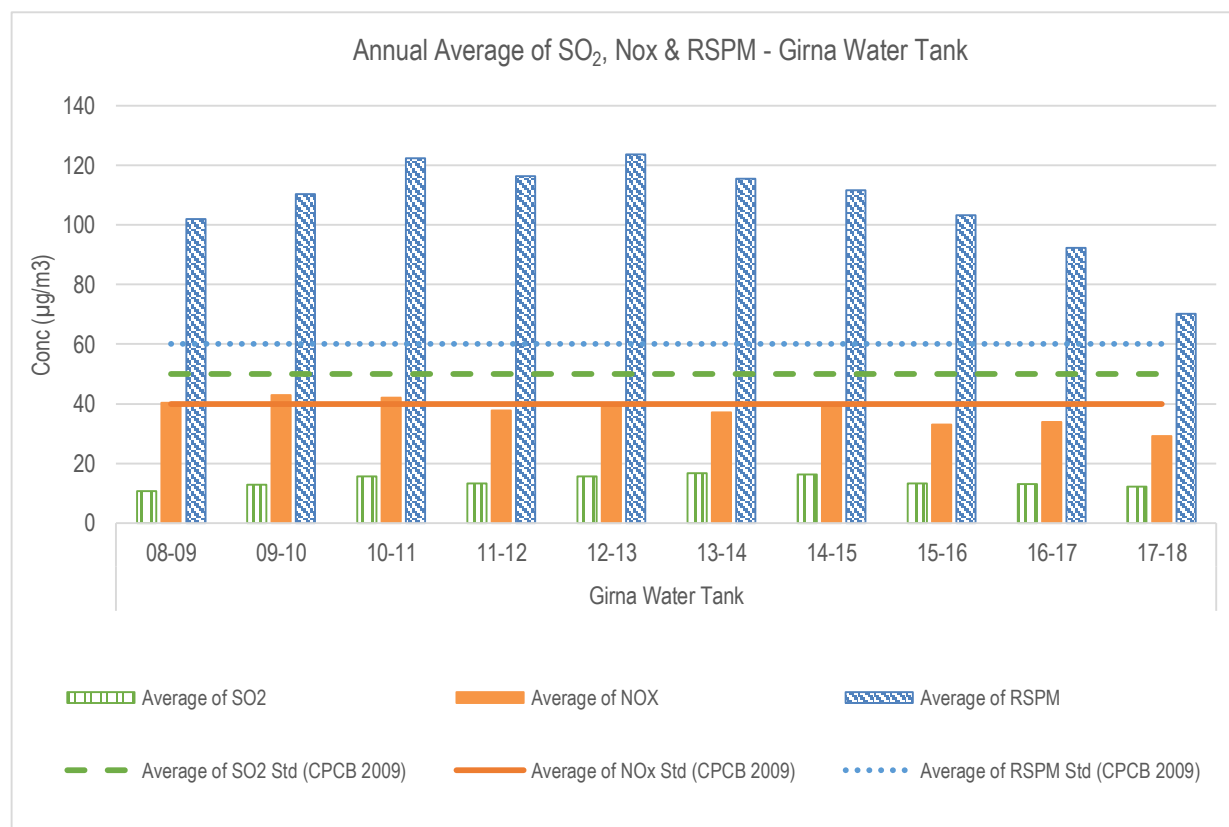


Figure No. 120: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Girna Water Tank

## Jalgaon - MIDC Jalgaon

Table No. 119: Data for Monthly average reading recorded at MIDC Jalgaon

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
MIDC Jalgaon	2017	Apr	15	36	94
		May	14	34	92
		Jun	13	35	92
		Jul	12	29	83
		Aug	11	28	65
		Sep	11	27	76
		Oct	13	27	77
		Nov	13	29	68
		Dec	15	32	67
	2018	Jan	15	34	69
		Feb	14	34	71
		Mar	14	34	76

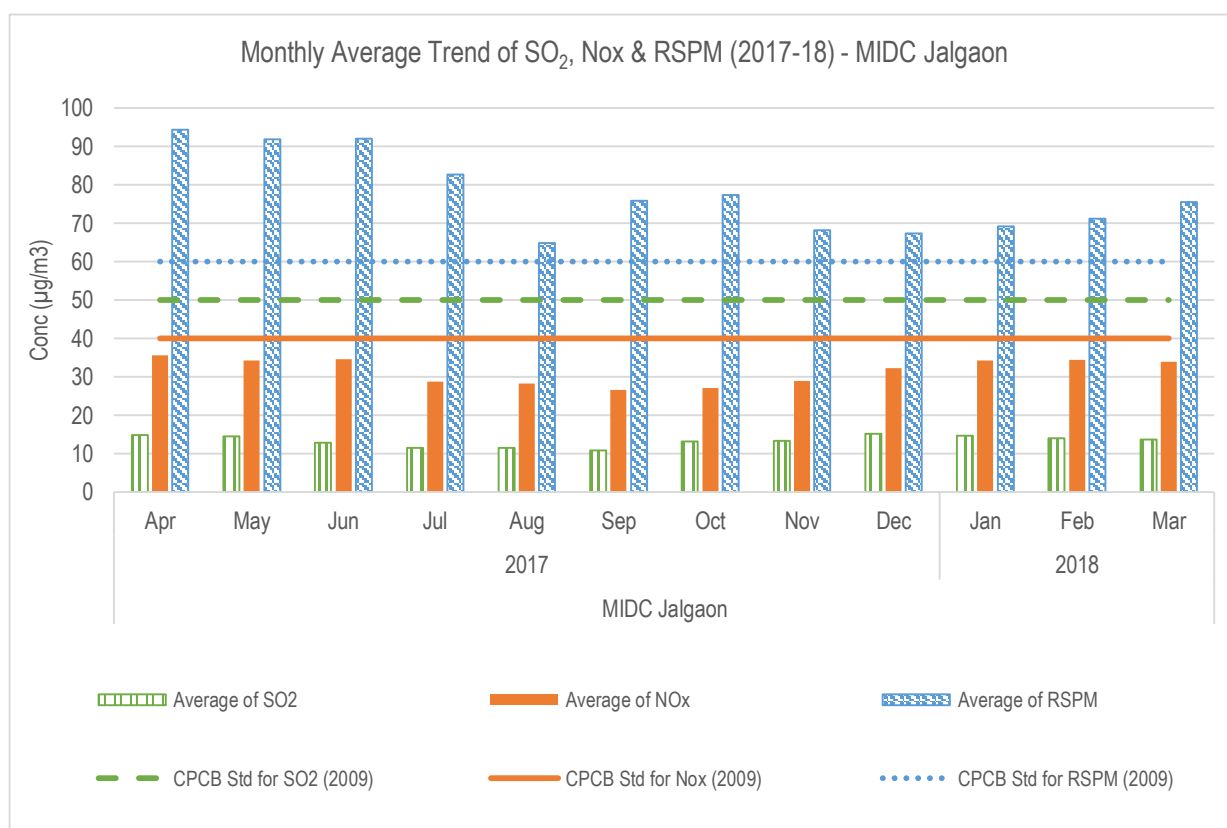


Figure No. 121: Monthly average reading recorded at MIDC Jalgaon

Table No. 120: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Jalgaon

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
MIDC Jalgaon	08-09	15	54	120
	09-10	16	49	120
	10-11	22	51	142
	11-12	22	49	137
	12-13	24	51	150
	13-14	23	45	132
	14-15	20	48	125
	15-16	16	41	114
	16-17	14	37	100
	17-18	13	32	78

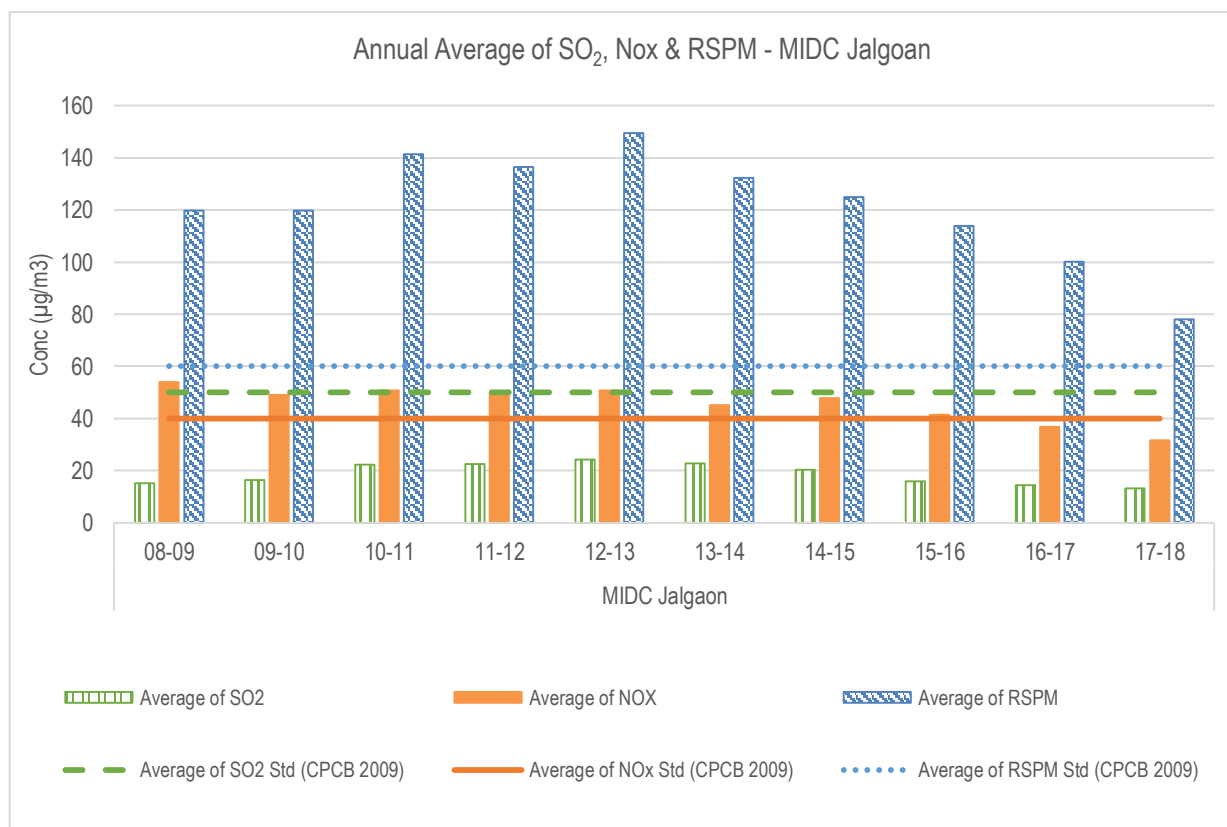


Figure No. 122: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Jalgaon

## Nashik - RTO Colony

Table No. 121: Data for Monthly average reading recorded at RTO Colony

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
RTO Colony	2017	Apr	23	28	94
		May	12	26	81
		Jun	11	23	74
		Jul	11	16	57
		Aug	10	15	54
		Sep	9	16	57
		Oct	5	19	131
		Nov	10	25	115
		Dec	5	19	131
	2018	Jan	8	22	97
		Feb	9	18	97
		Mar	11	19	125

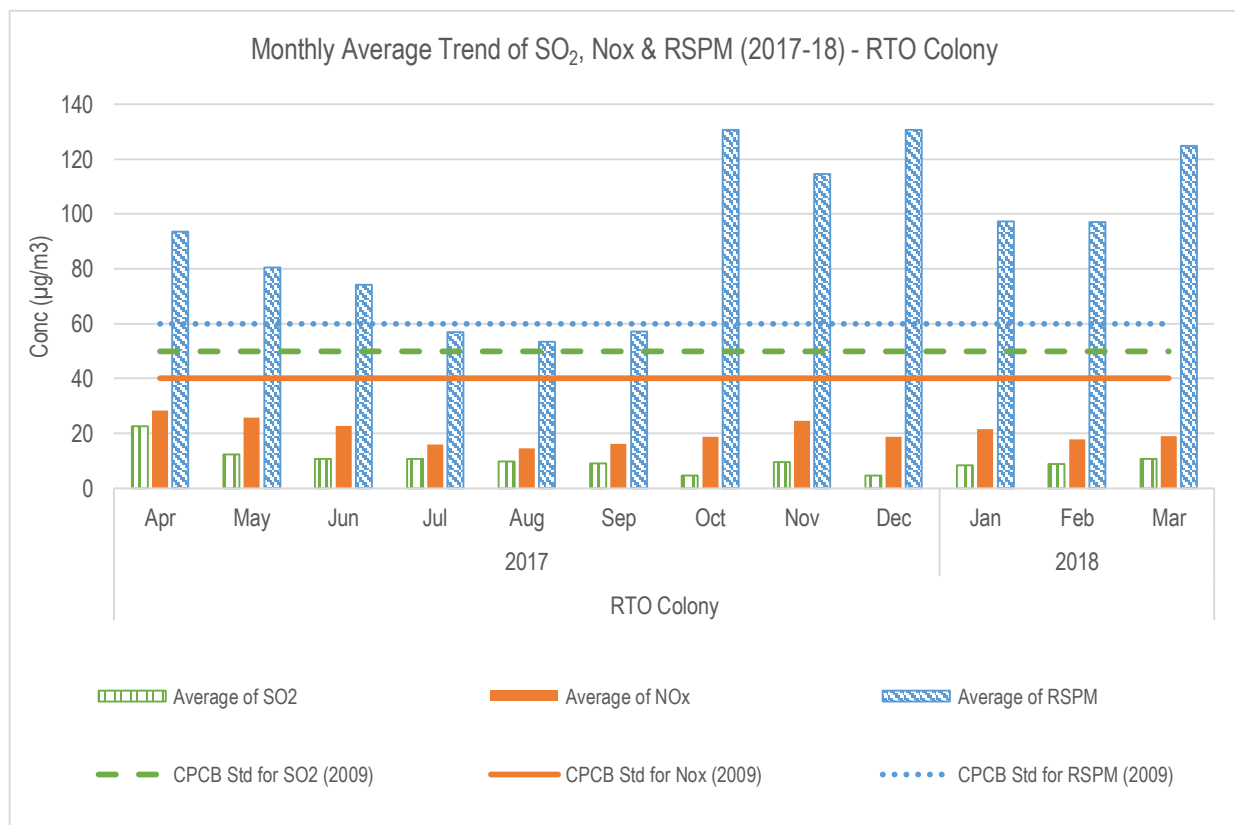


Figure No. 123: Monthly average reading recorded at RTO Colony

Table No. 122: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at RTO Colony

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
RTO Colony	04-05	33	25	79
	05-06	29	25	92
	06-07	32	26	51
	07-08	34	27	42
	08-09	26	25	88
	09-10	21	29	81
	10-11	21	23	75
	11-12	24	28	98
	12-13	25	27	90
	13-14	28	28	71
	14-15	24	26	77
	15-16	14	23	73
	16-17	12	25	83
	17-18	10	20	93

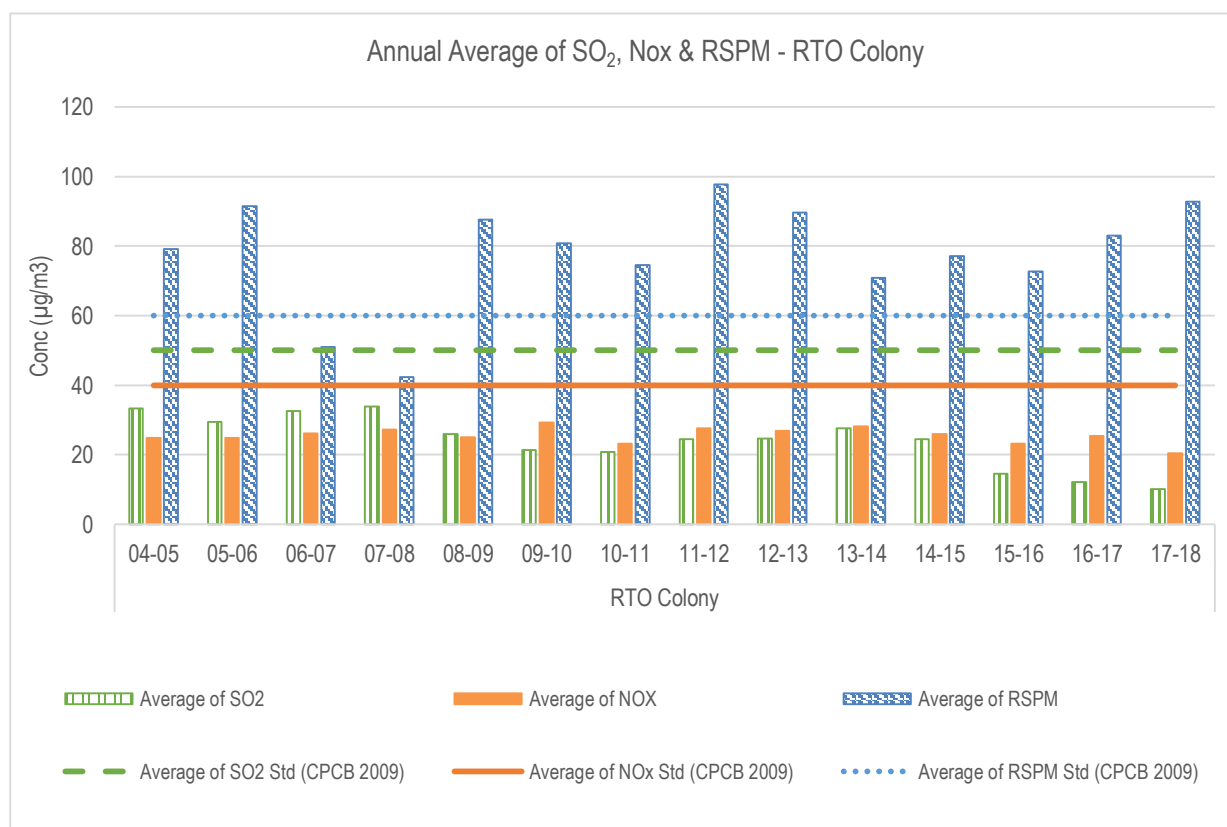


Figure No. 124: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at RTO Colony

## Nashik - MIDC Satpur - VIP

Table No. 123: Data for Monthly average reading recorded at MIDC Satpur - VIP

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
MIDC Satpur - VIP	2017	Apr	19	26	124
		May	14	24	77
		Jun	10	20	57
		Jul	10	16	41
		Aug	9	13	52
		Sep	9	15	48
		Oct	4	17	112
		Nov	9	22	81
		Dec	4	17	112
	2018	Jan	8	22	79
		Feb	9	19	73
		Mar	13	20	108

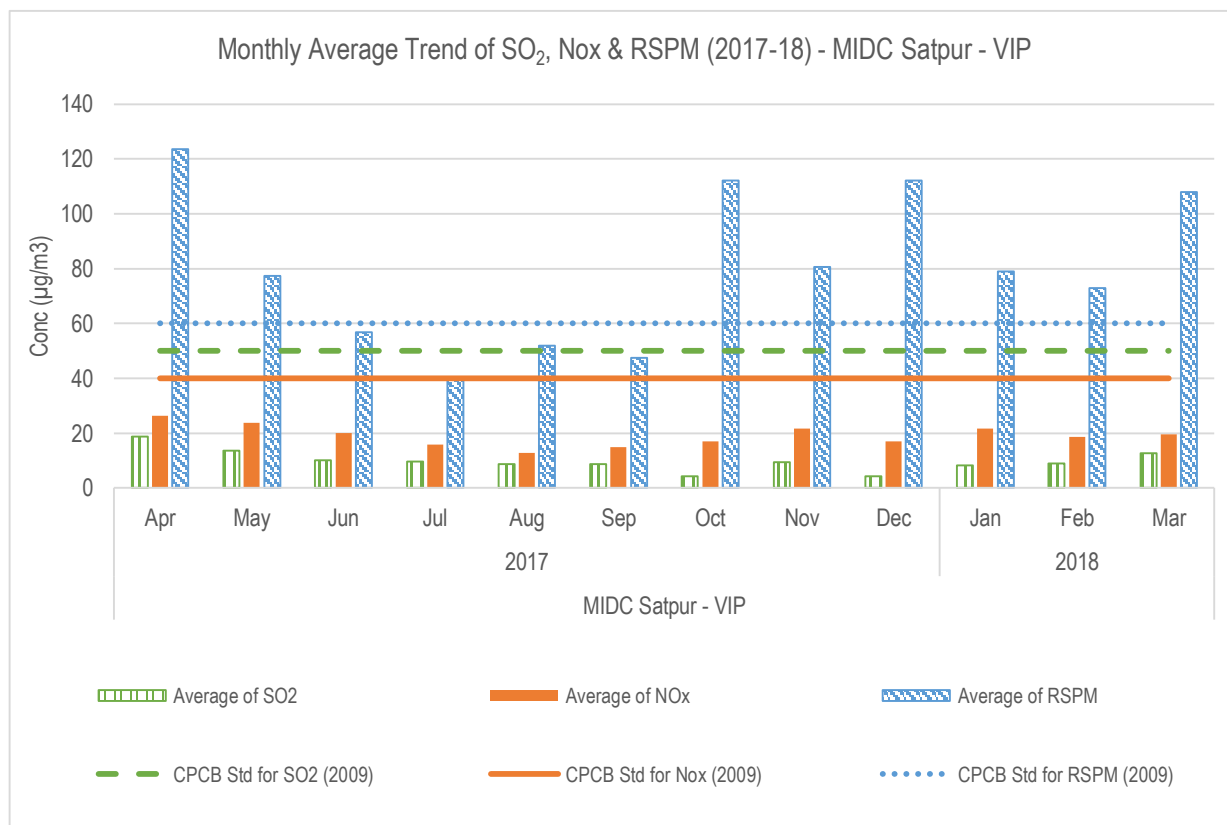


Figure No. 125: Monthly average reading recorded at MIDC Satpur - VIP

Table No. 124: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Satpur - VIP

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
MIDC Satpur - VIP	04-05	36	27	90
	05-06	33	28	98
	06-07	34	28	58
	07-08	41	34	52
	08-09	30	27	91
	09-10	23	29	85
	10-11	23	25	70
	11-12	25	28	98
	12-13	25	27	92
	13-14	27	28	71
	14-15	25	26	80
	15-16	14	22	78
	16-17	11	24	88
	17-18	10	19	81

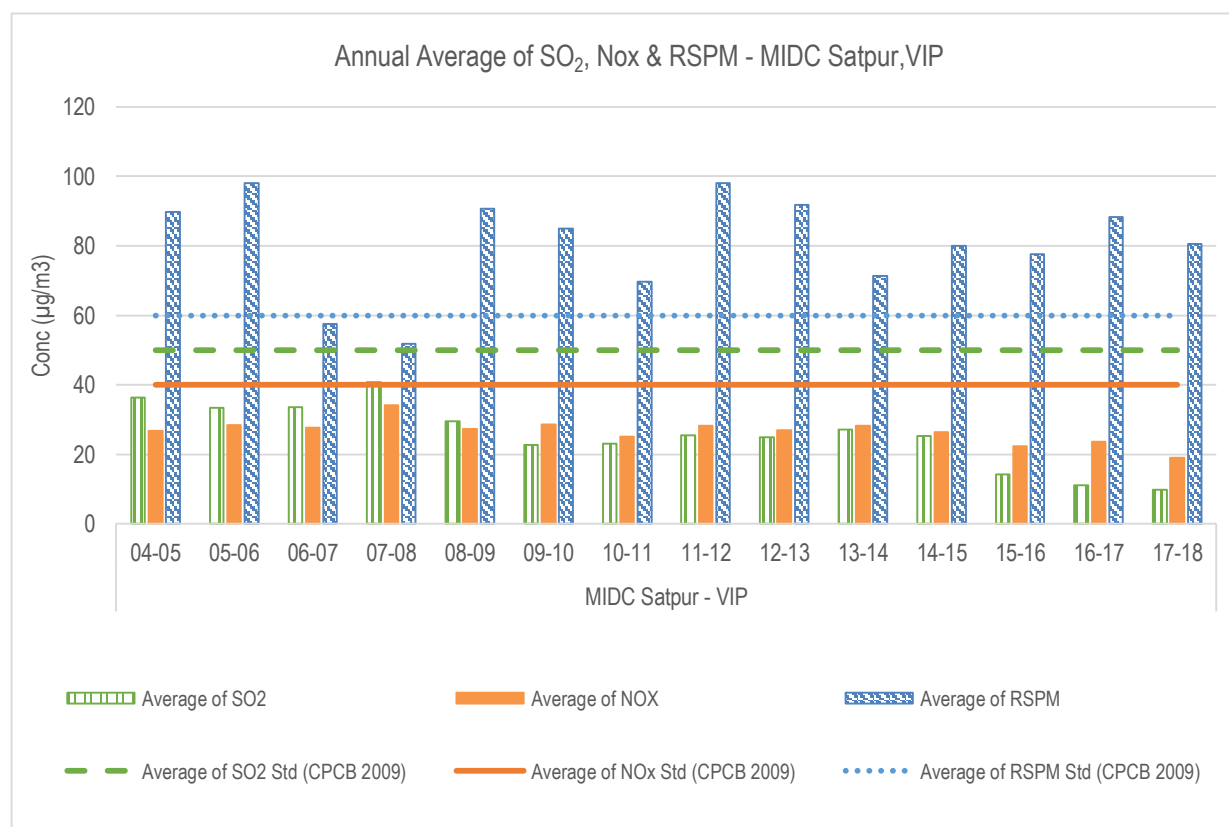


Figure No. 126: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at MIDC Satpur - VIP



## Nashik - NMC Nashik

Table No. 125: Data for Monthly average reading recorded at NMC Nashik

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
NMC Nashik	2017	Apr	22	29	99
		May	9	15	74
		Jun	10	23	82
		Jul	10	16	58
		Aug	9	14	51
		Sep	9	21	65
		Oct	4	20	148
		Nov	9	25	124
		Dec	4	20	148
	2018	Jan	10	25	131
		Feb	9	19	117
		Mar	13	23	108

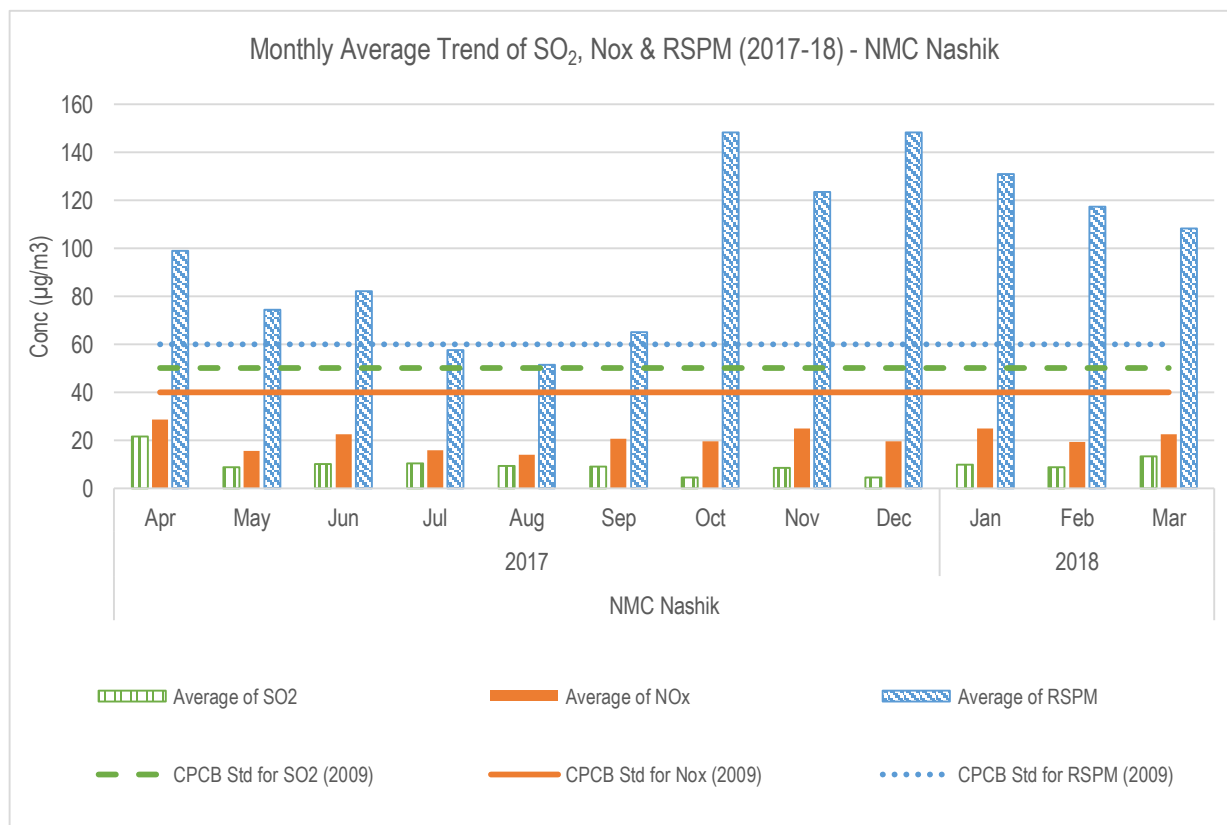


Figure No. 127: Monthly average reading recorded at NMC Nashik

Table No. 126: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at NMC Nashik

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
NMC Nashik	13-14	28	28	70
	14-15	25	26	78
	15-16	15	24	94
	16-17	12	26	97
	17-18	10	20	100

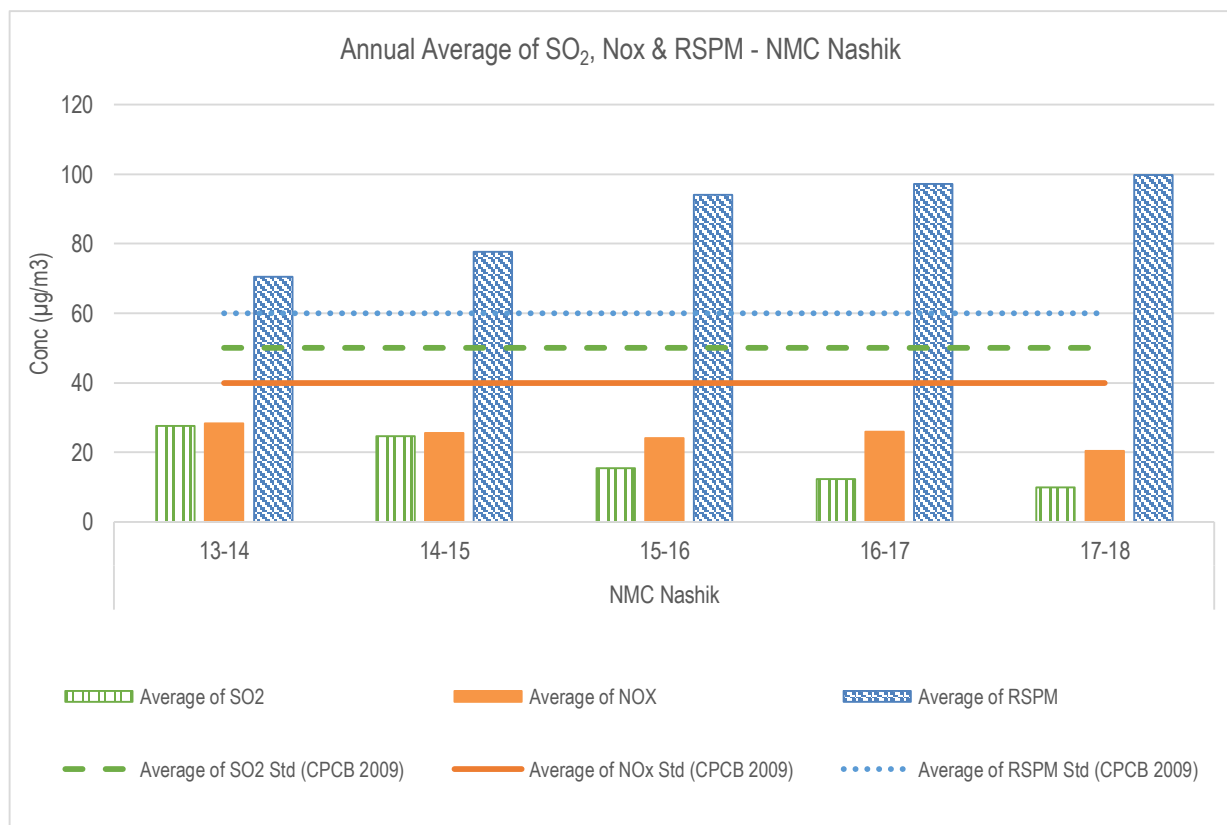


Figure No. 128: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at NMC Nashik

## Nashik - SRO Office Nashik

Table No. 127: Data for Monthly average reading recorded a SRO Office Nashik

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
SRO Office Nashik	2017	Apr	22	29	93
		May	13	24	72
		Jun	11	23	55
		Jul	10	15	43
		Aug	10	14	38
		Sep	9	16	43
		Oct	5	21	95
		Nov	7	23	92
		Dec	5	21	95
	2018	Jan	9	23	134
		Feb	9	17	105
		Mar	11	17	114

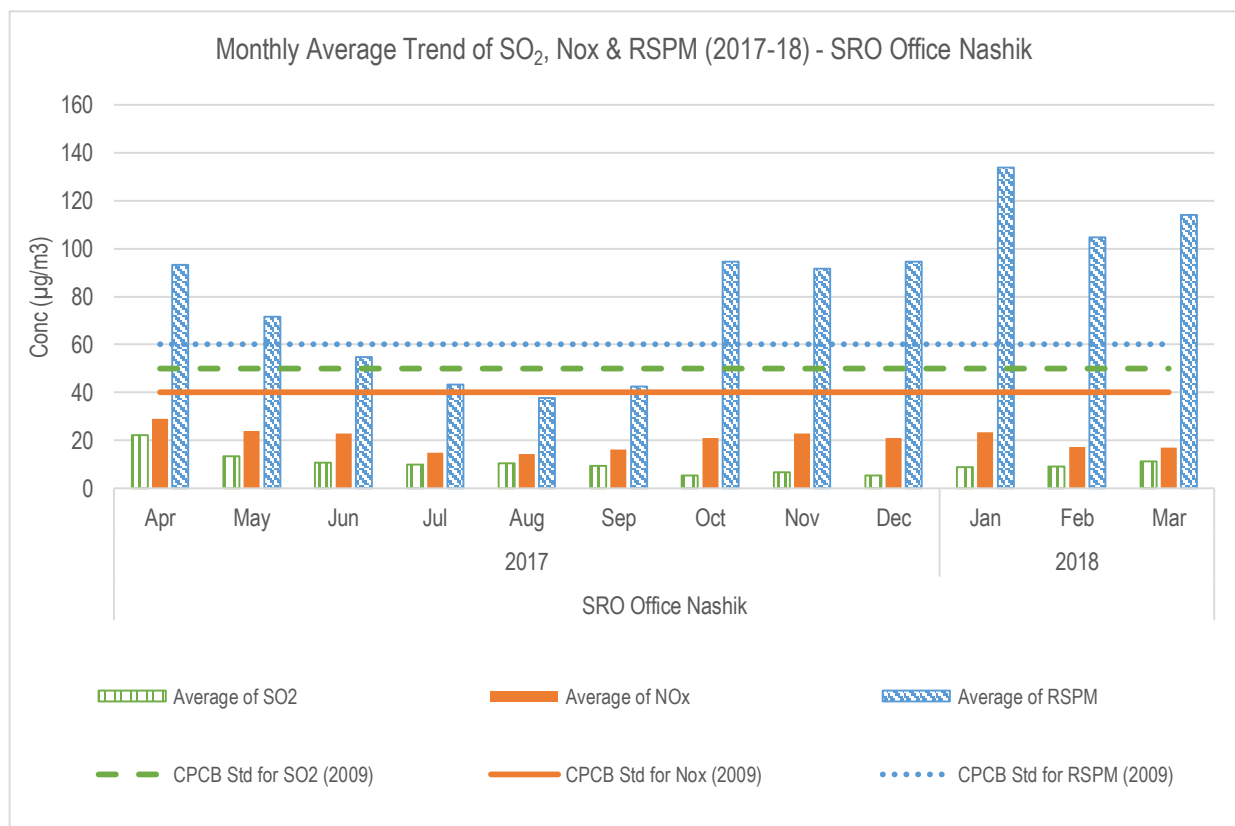


Figure No. 129: Monthly average reading recorded at SRO Office Nashik

Table No. 128: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at SRO Office Nashik

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
SRO Office Nashik	04-05	19	31	69
	05-06	14	27	78
	06-07	16	27	102
	07-08	17	26	114
	08-09	23	29	104
	09-10	21	27	86
	10-11	20	23	85
	11-12	24	28	114
	12-13	24	27	90
	13-14	28	28	78
	14-15	26	26	73
	15-16	15	24	76
	16-17	11	26	72
	17-18	10	21	80

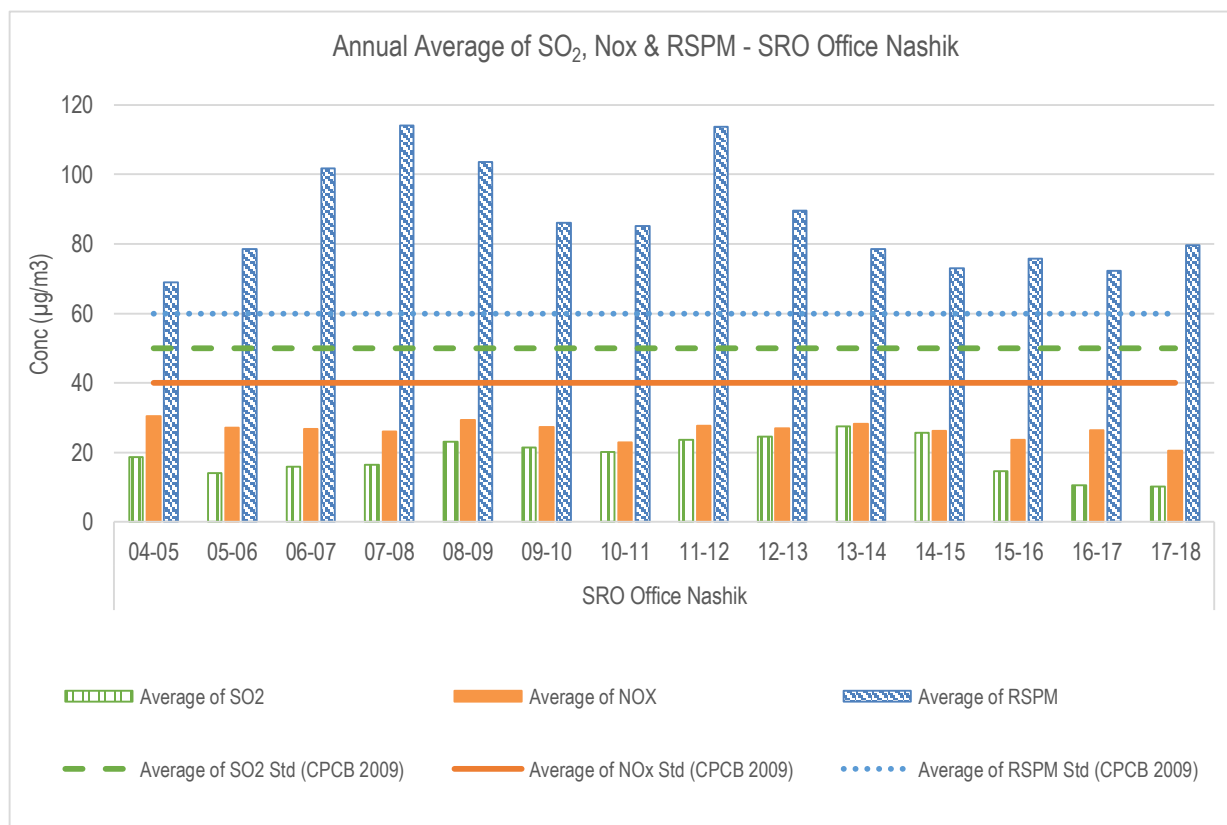


Figure No. 130: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at SRO Office Nashik

## Nashik - Nashik CAAQMS

Table No. 129: Data for Monthly average reading recorded at Nashik CAAQMS

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Nashik CAAQMS	2017	Apr	6	19	91
		May	3	7	55
		Jun	2	7	39
		Jul	3	11	33
		Aug	2	11	39
		Sep	3	11	41
		Oct	3	25	56
		Nov	4	26	85
		Dec	5	30	76
	2018	Jan	7	26	78
		Feb	8	20	77
		Mar	10	17	78

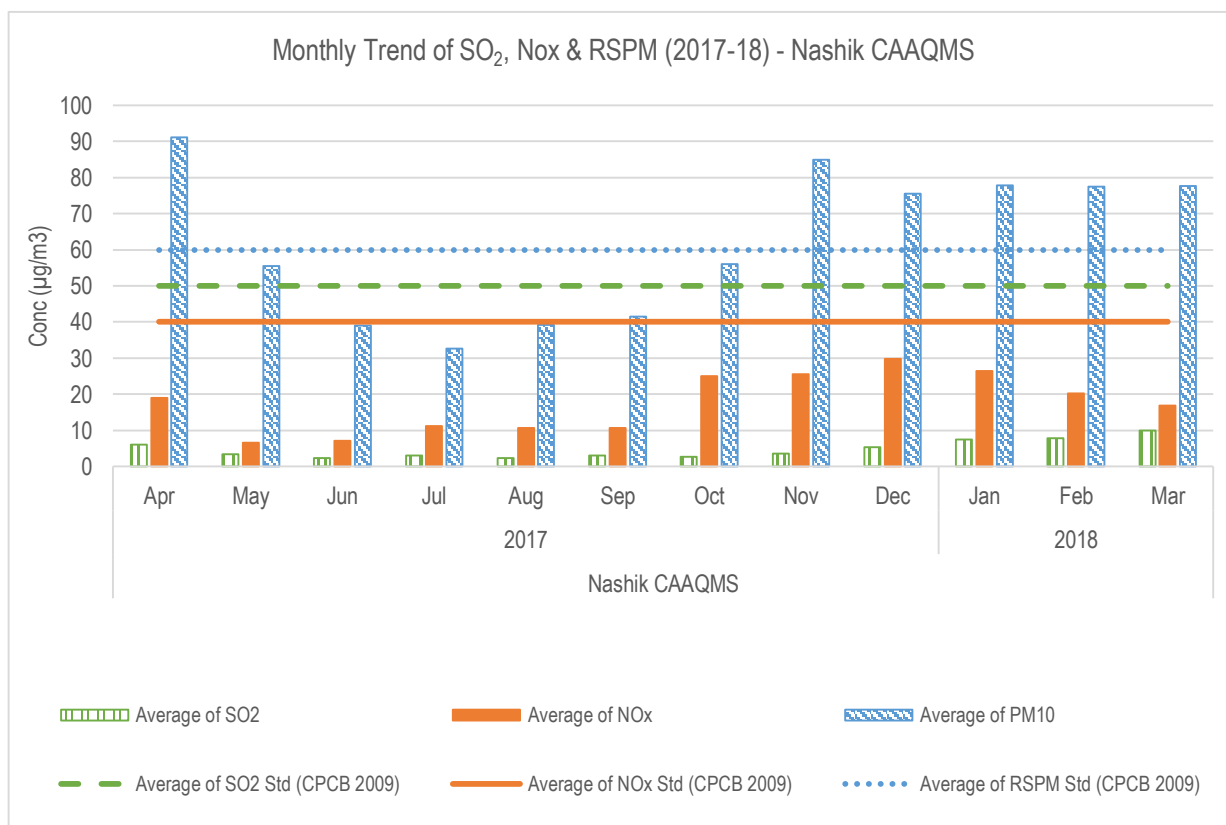


Figure No. 131: Monthly average reading recorded at Nashik CAAQMS

Table No. 130: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nashik CAAQMS

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Nashik CAAQMS	16-17	6	33	64
	17-18	5	17	63

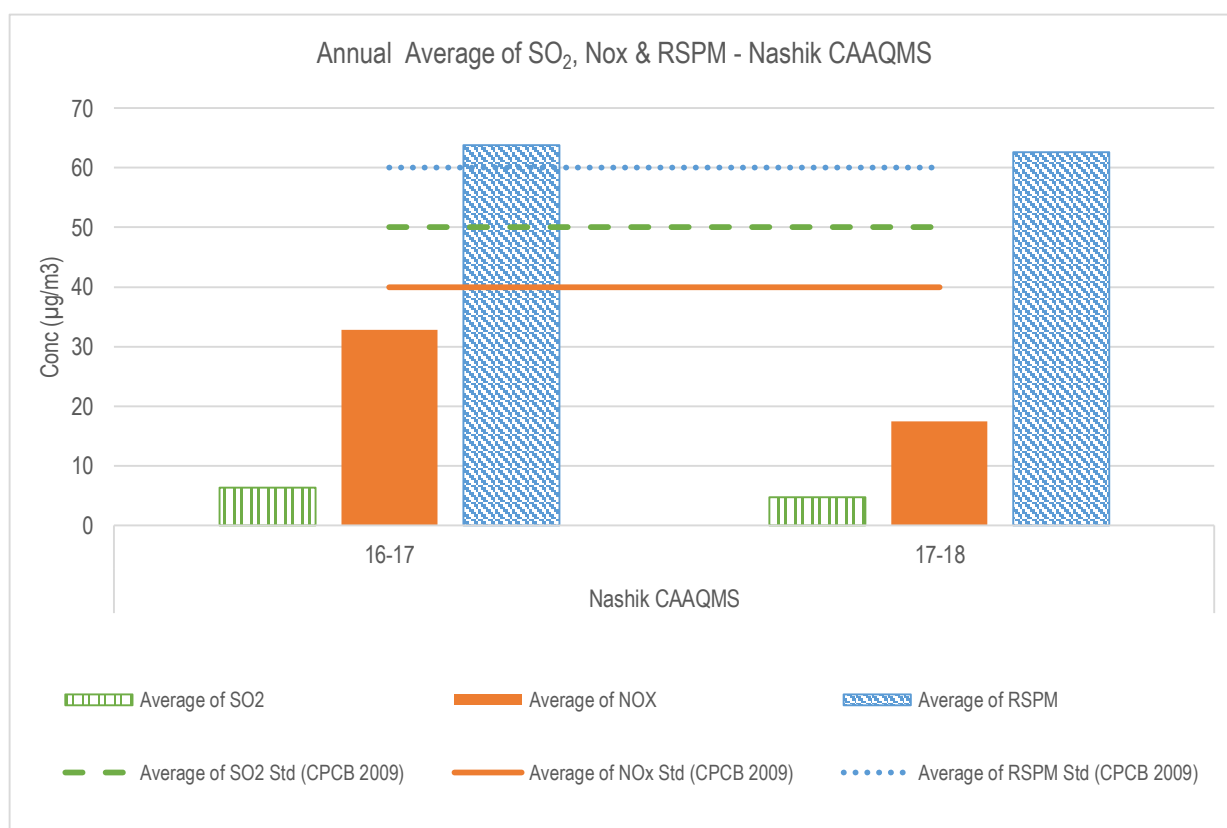
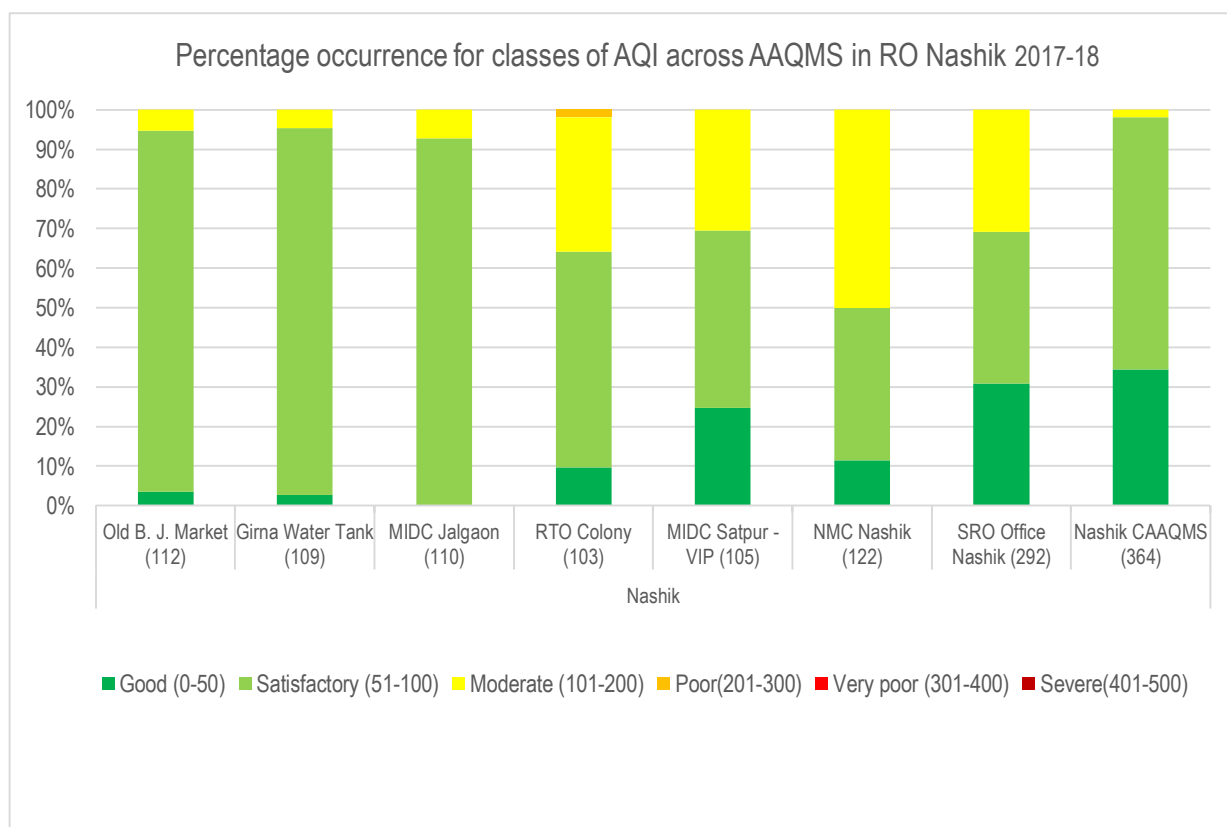


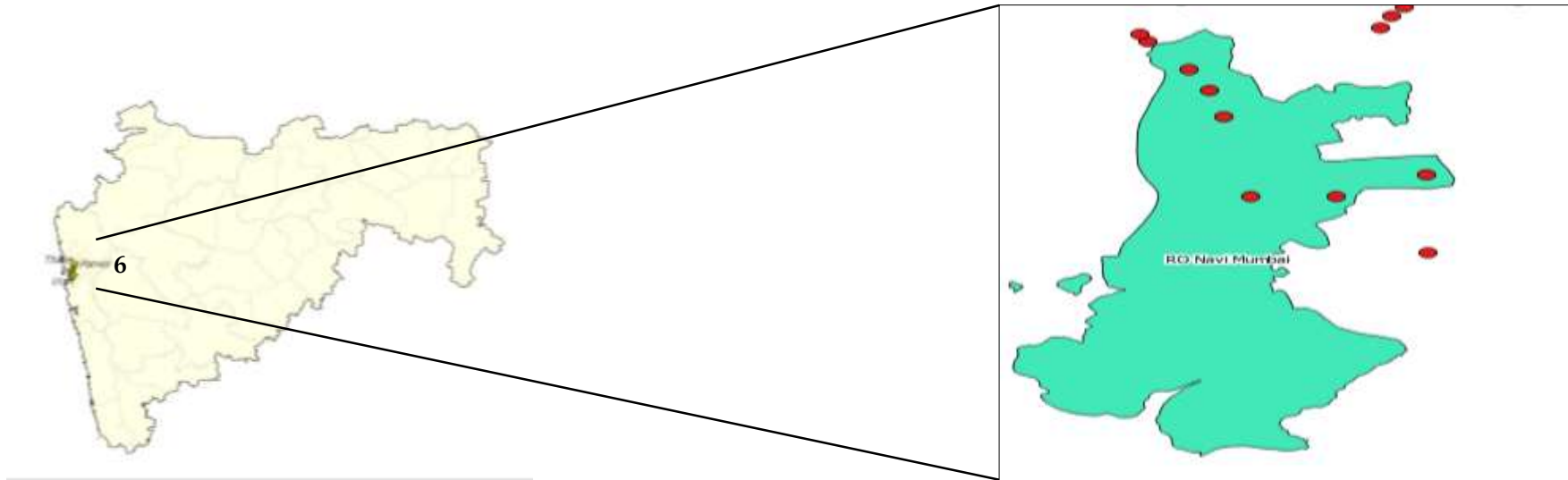
Figure No. 132: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nashik CAAQMS

Table No. 131: Percentage exceedance of pollutants at Nashik RO

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Old B. J. Market	112	0	1	6	0	1	5
Girna Water Tank	109	0	0	5	0	0	5
MIDC Jalgaon	110	0	0	8	0	0	7
RTO Colony	103	0	0	37	0	0	36
MIDC Satpur - VIP	105	0	0	32	0	0	30
NMC Nashik	122	0	0	61	0	0	50
SRO Office Nashik	292	0	0	90	0	0	31
Nashik CAAQMS	364	0	0	204	0	0	41



## RO – Navi Mumbai



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Navi Mumbai	Navi Mumbai	491	Rabale	Industrial	19° 08' 15.2" N	73° 00' 13.1" E
	Navi Mumbai	492	Nerul - DY Patil	Residential	19° 02' 28.1" N	73° 01' 29.5" E
	Navi Mumbai	493	Mahape, MPCB-Nirmal Bhavan	Industrial	19° 06' 49.0" N	73° 00' 40.1" E
	Navi Mumbai		Airoli	Rural and other areas	19° 09' 21.4" N	72° 59' 35.4" E
	Taloja	494	Kharghar - CIDCO Nodal Office	Residential	19° 02' 29.4" N	73° 04' 11.8" E
	Taloja	496	Taloja - MIDC Building	Industrial	19° 03' 40.0" N	73° 06' 58.6" E



## Navi Mumbai - Rabale

Table No. 132: Data for Monthly average reading recorded at Rabale

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Rabale	2017	Apr	28	58	97
		May	24	50	80
		Jun	18	32	75
		Jul	23	30	32
		Aug	20	41	54
		Sep	23	43	83
		Oct	25	37	116
		Nov	25	49	184
		Dec	25	53	244
	2018	Jan	22	49	231
		Feb	20	53	98
		Mar	23	54	75

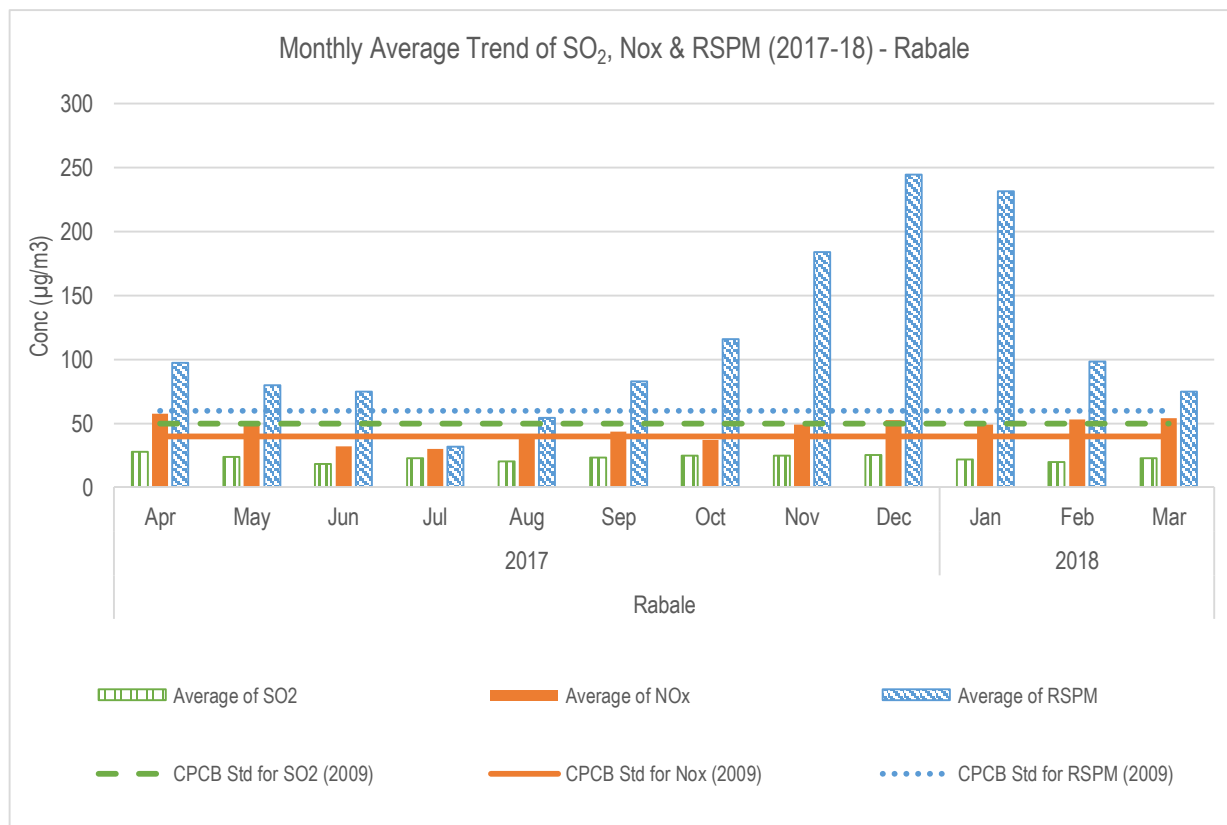


Figure No. 133: Monthly average reading recorded at Rabale

Table No. 133: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Rabale

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Rabale	06-07	25	31	106
	07-08	12	27	79
	08-09	16	31	94
	09-10	13	36	83
	10-11	22	43	125
	11-12	18	47	100
	12-13	18	46	71
	13-14	18	44	90
	14-15	18	40	132
	15-16	21	48	131
	16-17	20	44	107
	17-18	23	46	112

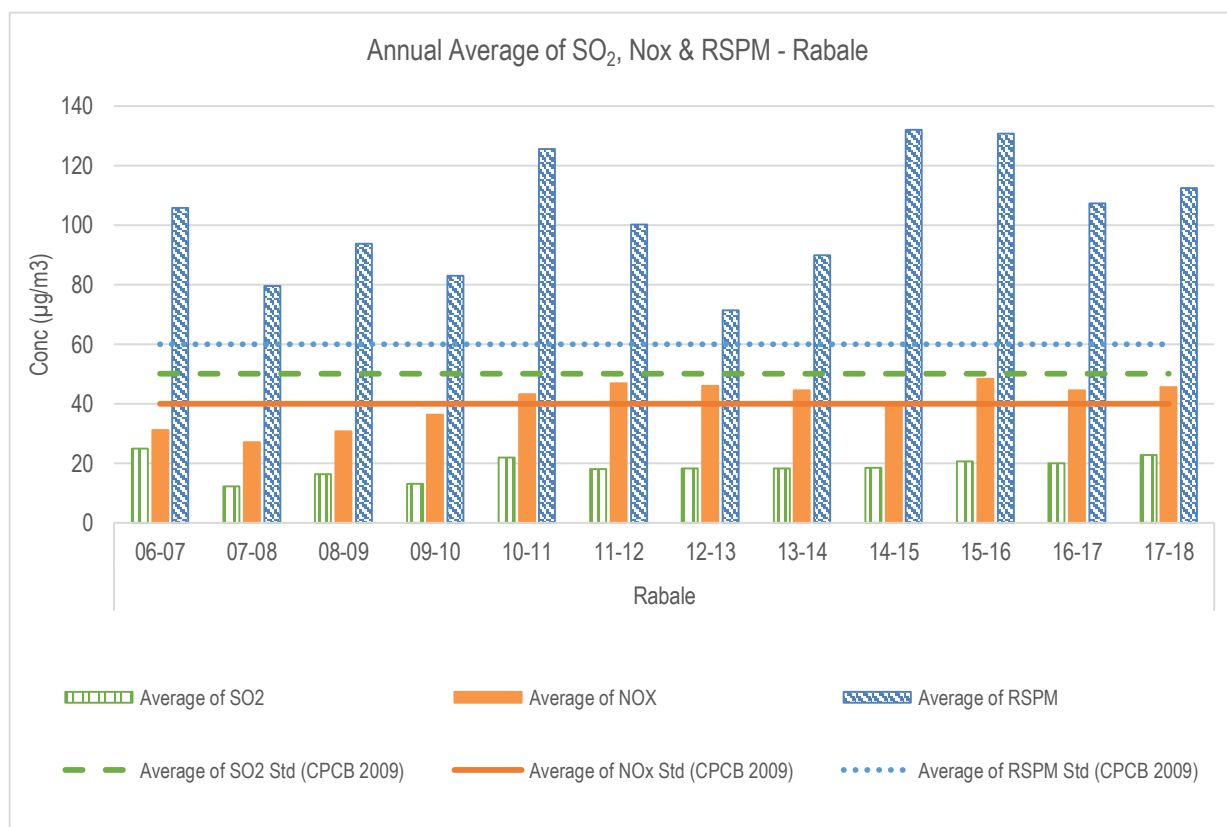


Figure No. 134: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Rabale

## Navi Mumbai - Nerul – DY Patil

Table No. 134: Data for Monthly average reading recorded at Nerul – DY Patil

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Nerul - DY Patil	2017	Apr	27	58	301
		May	23	44	124
		Jun	21	45	122
		Jul	22	32	31
		Aug	17	30	61
		Sep	21	33	86
		Oct	23	33	99
		Nov	24	45	129
		Dec	23	48	151
	2018	Jan	17	59	148
		Feb	18	44	88
		Mar	18	50	73

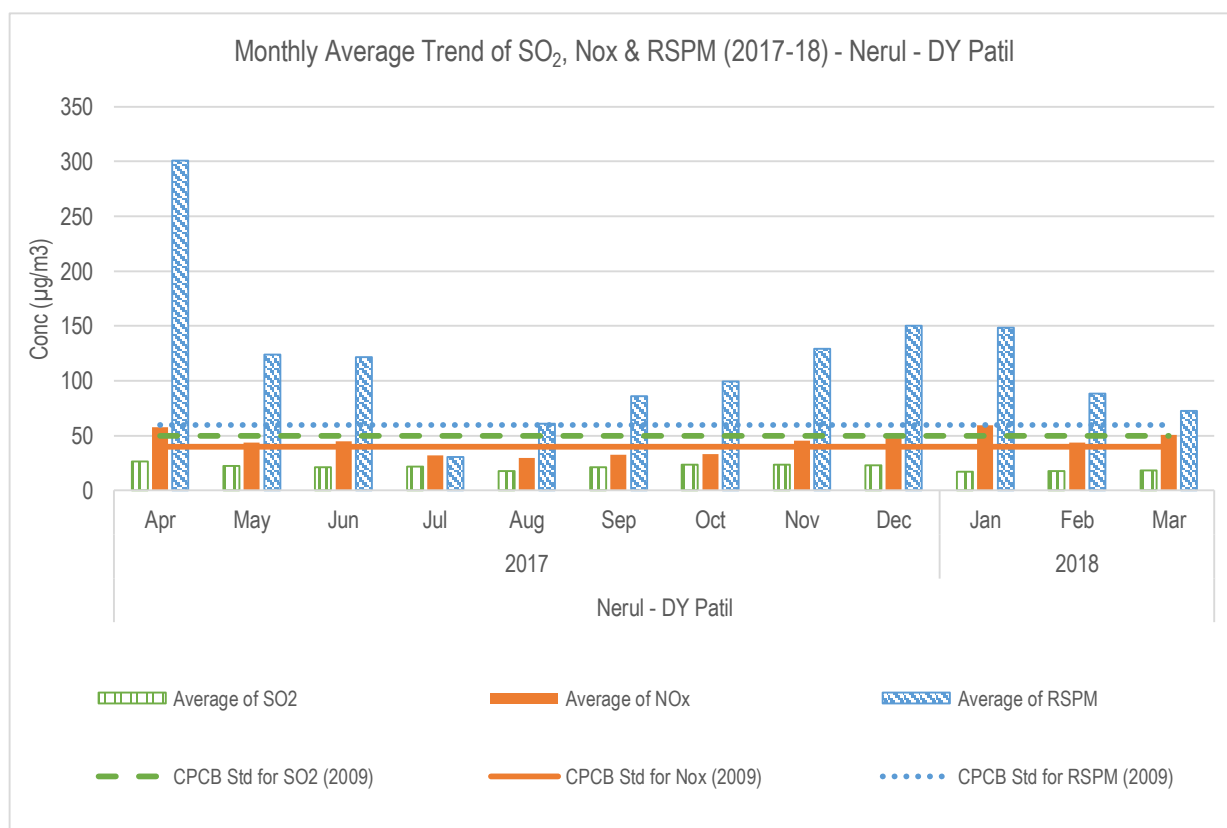


Figure No. 135: Monthly average reading recorded at Nerul – DY Patil

Table No. 135: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nerul – DY Patil

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Nerul - DY Patil	06-07	25	31	107
	07-08	17	33	90
	08-09	20	40	98
	09-10	10	37	71
	10-11	14	33	119
	11-12	15	43	118
	12-13	15	40	95
	13-14	17	41	109
	14-15	17	38	131
	15-16	17	41	136
	16-17	18	41	96
	17-18	21	43	116

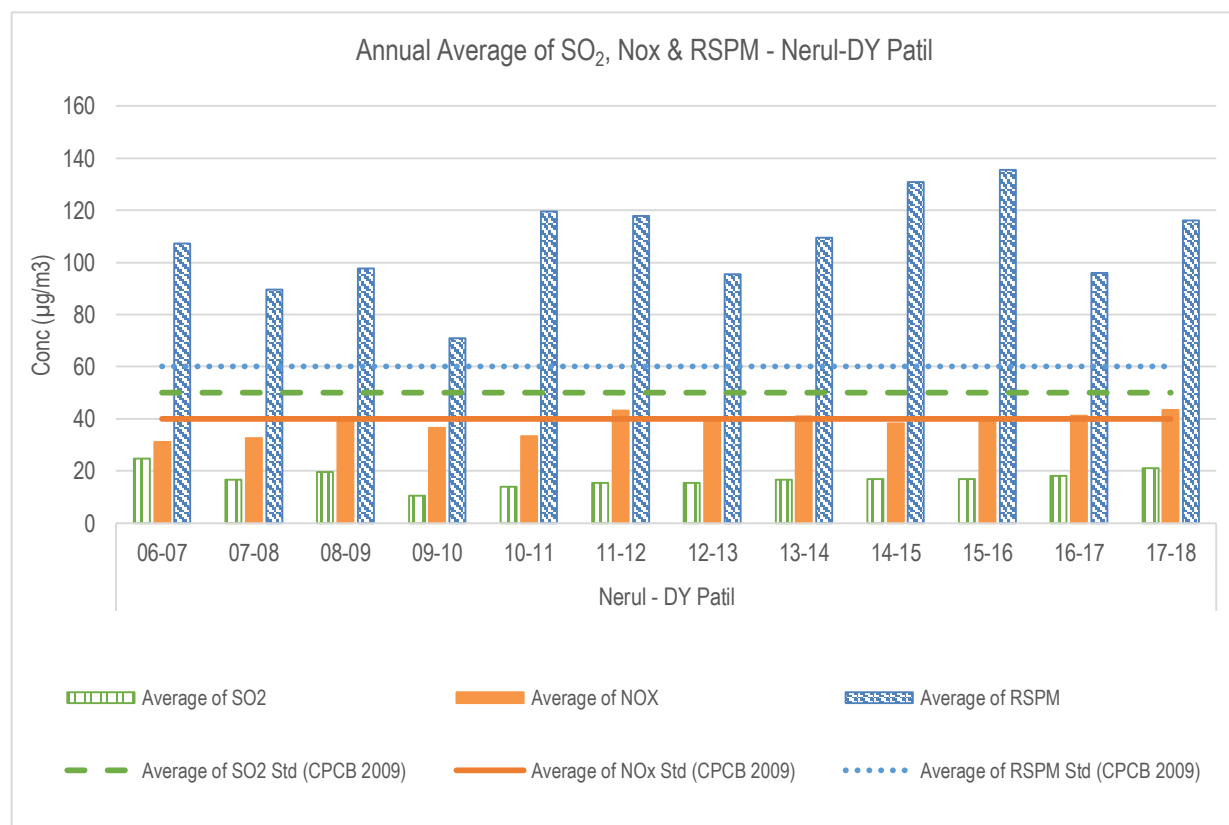


Figure No. 136: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nerul – DY Patil

## Navi Mumbai - Mahape, MPCB Nirmal Bhavan

Table No. 136: Data for Monthly average reading recorded at Mahape, MPCB Nirmal Bhavan

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Mahape, MPCB-Nirmal Bhavan	2017	Apr	24	42	90
		May	25	51	66
		Jun	22	54	75
		Jul	24	32	28
		Aug	20	38	53
		Sep	22	40	60
		Oct	21	34	106
		Nov	24	57	127
		Dec	23	51	144
	2018	Jan	21	64	102
		Feb	35	46	96
		Mar	26	39	85

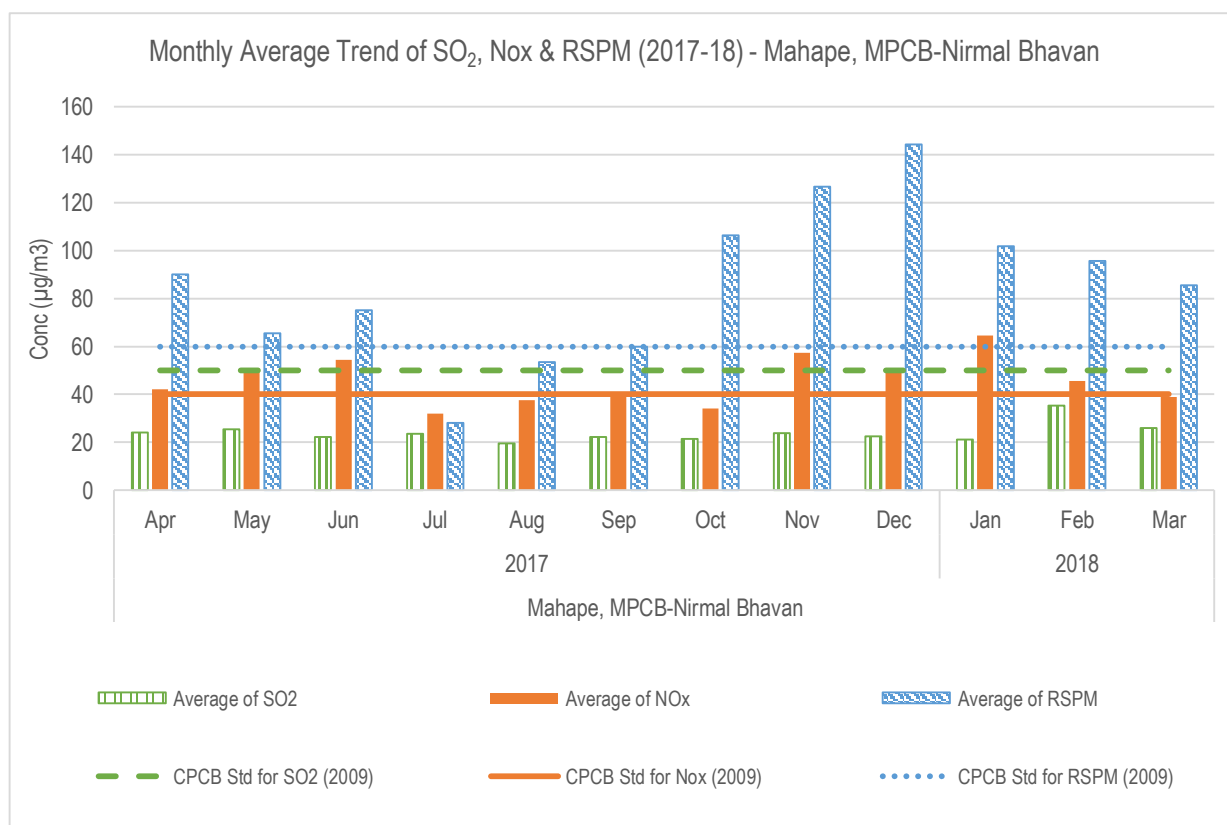
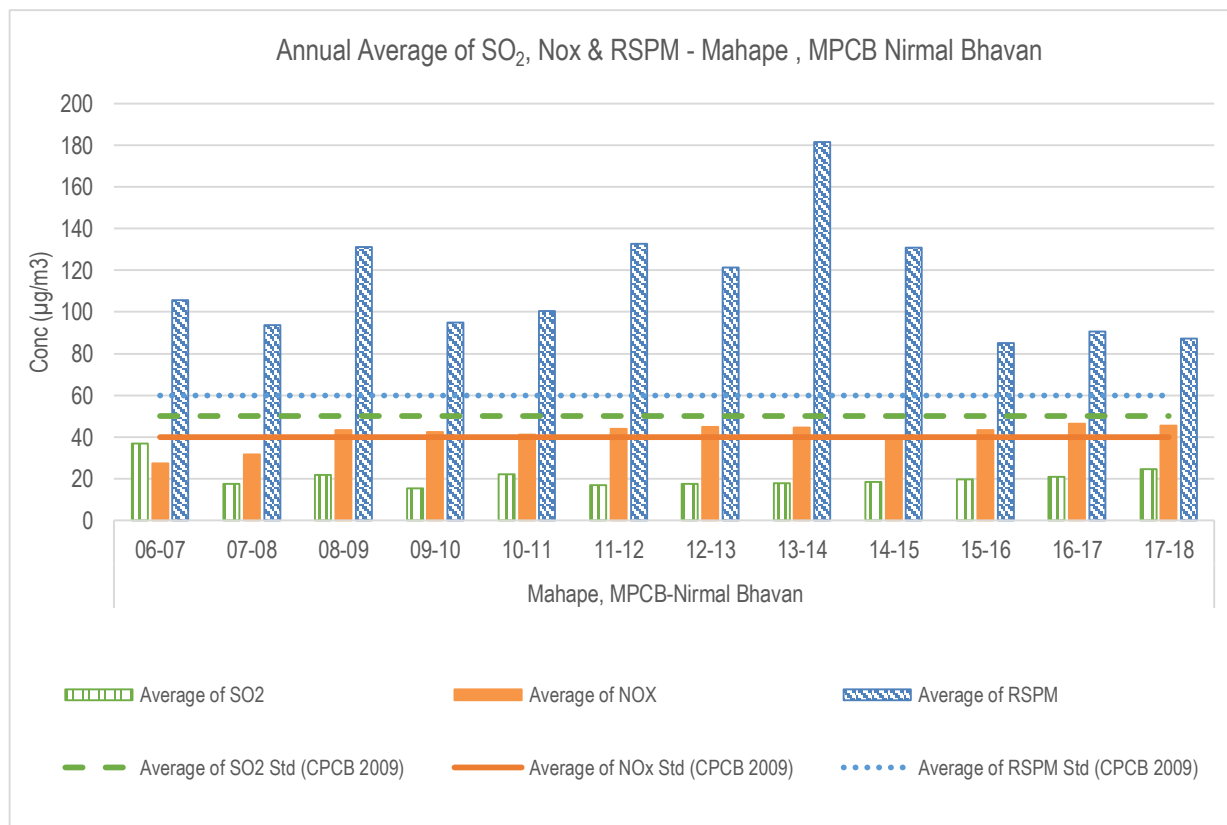


Figure No. 137: Monthly average reading recorded at Mahape, MPCB Nirmal Bhavan

**Table No. 137: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Mahape, MPCB Nirmal Bhavan**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Mahape, MPCB-Nirmal Bhavan	06-07	37	27	106
	07-08	17	32	94
	08-09	22	43	131
	09-10	15	42	95
	10-11	22	41	101
	11-12	17	44	133
	12-13	18	45	121
	13-14	18	45	182
	14-15	18	40	131
	15-16	20	43	85
	16-17	21	46	91
	17-18	24	45	87



**Figure No. 138: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Mahape, MPCB Nirmal Bhavan**

## Navi Mumbai - Airoli

Table No. 138: Data for Monthly average reading recorded at Airoli

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Airoli	2017	Apr	23	40	61
		May	26	36	38
		Jun	26	35	19
		Jul	24	33	12
		Aug	25	35	20
		Sep	22	30	30
		Oct	24	33	90
		Nov	20	31	90
		Dec	31	43	115
	2018	Jan	46	58	122
		Feb	49	47	123
		Mar	32	24	93

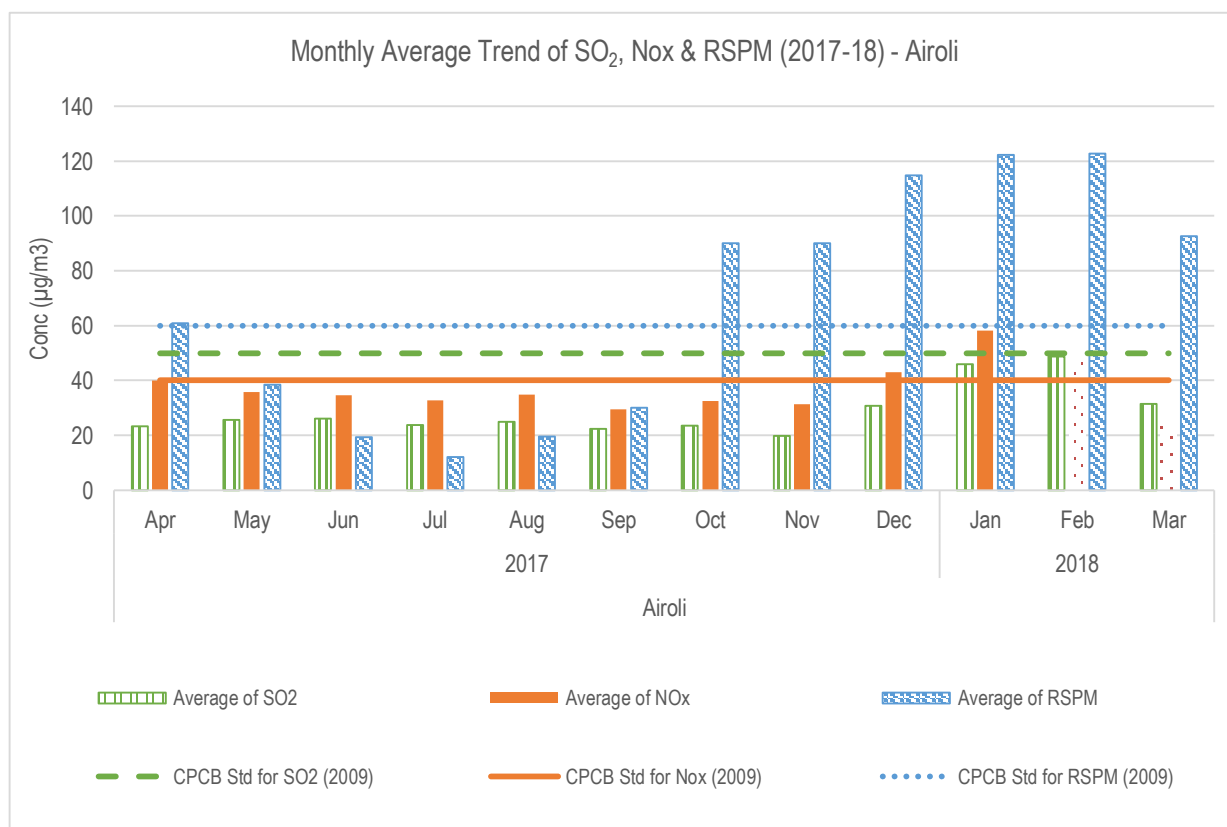


Figure No. 139: Monthly average reading recorded at Airoli

Table No. 139: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Airoli

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Airoli	08-09	31	112	87
	09-10	23	89	120
	10-11	27	67	128
	11-12	13	75	181
	12-13	21	43	109
	13-14	22	53	53
	14-15	17	28	38
	15-16	26	39	36
	16-17	26	39	35
	17-18	30	37	69

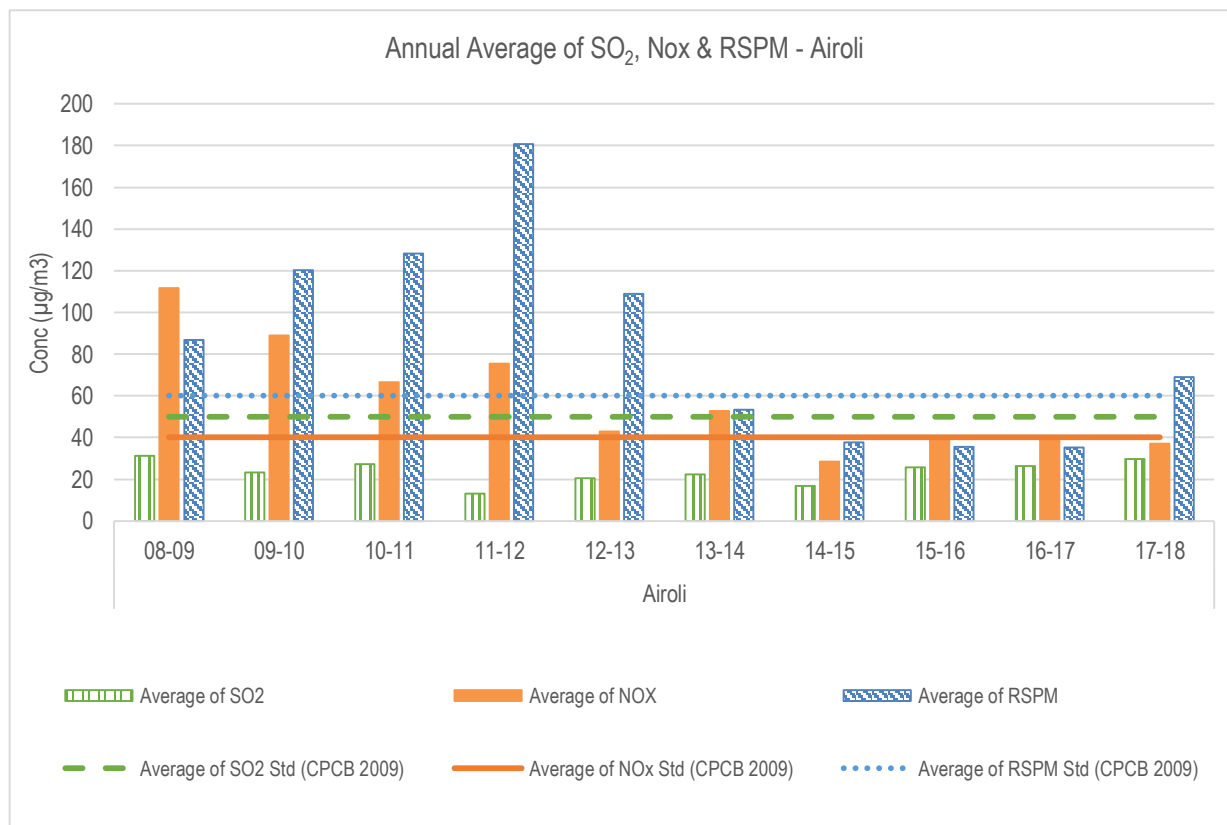


Figure No. 140: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Airoli



### Taloja - Kharghar-CIDCO Nodal Office

Table No. 140: Data for Monthly average reading recorded at Kharghar-CIDCO Nodal Office

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Kharghar - CIDCO Nodal Office	2017	Apr	27	58	85
		May	19	43	71
		Jun	21	39	62
		Jul	22	27	33
		Aug	19	37	47
		Sep	21	40	76
		Oct	24	32	108
		Nov	25	45	113
		Dec	23	45	159
	2018	Jan	21	61	144
		Feb	19	50	110
		Mar	22	50	78

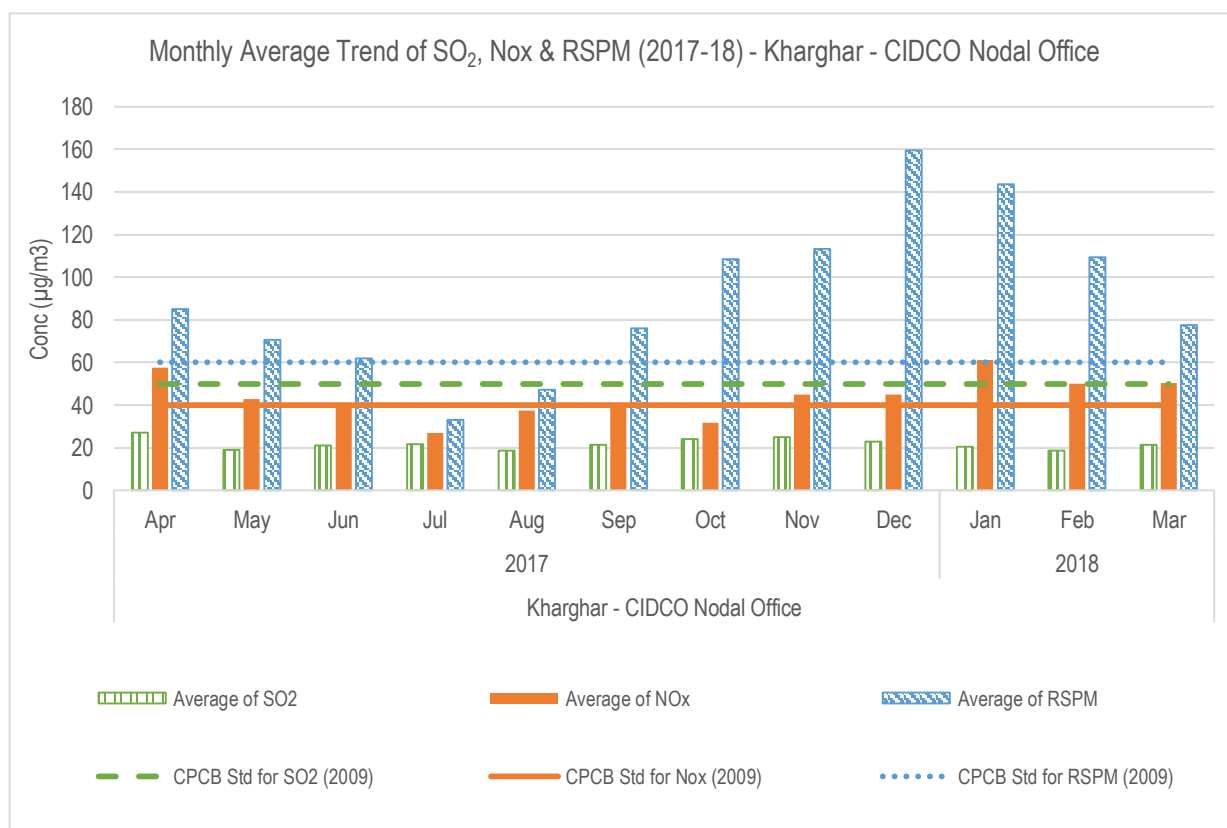


Figure No. 141: Monthly average reading recorded at Kharghar-CIDCO Nodal Office

Table No. 141: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Kharghar-CIDCO Nodel Office

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Kharghar - CIDCO Nodal Office	06-07	18	33	96
	07-08	10	31	108
	08-09	13	40	115
	09-10	10	35	75
	10-11	17	37	122
	11-12	16	43	122
	12-13	16	41	122
	13-14	17	42	125
	14-15	17	38	127
	15-16	17	41	116
	16-17	18	45	90
	17-18	22	44	91

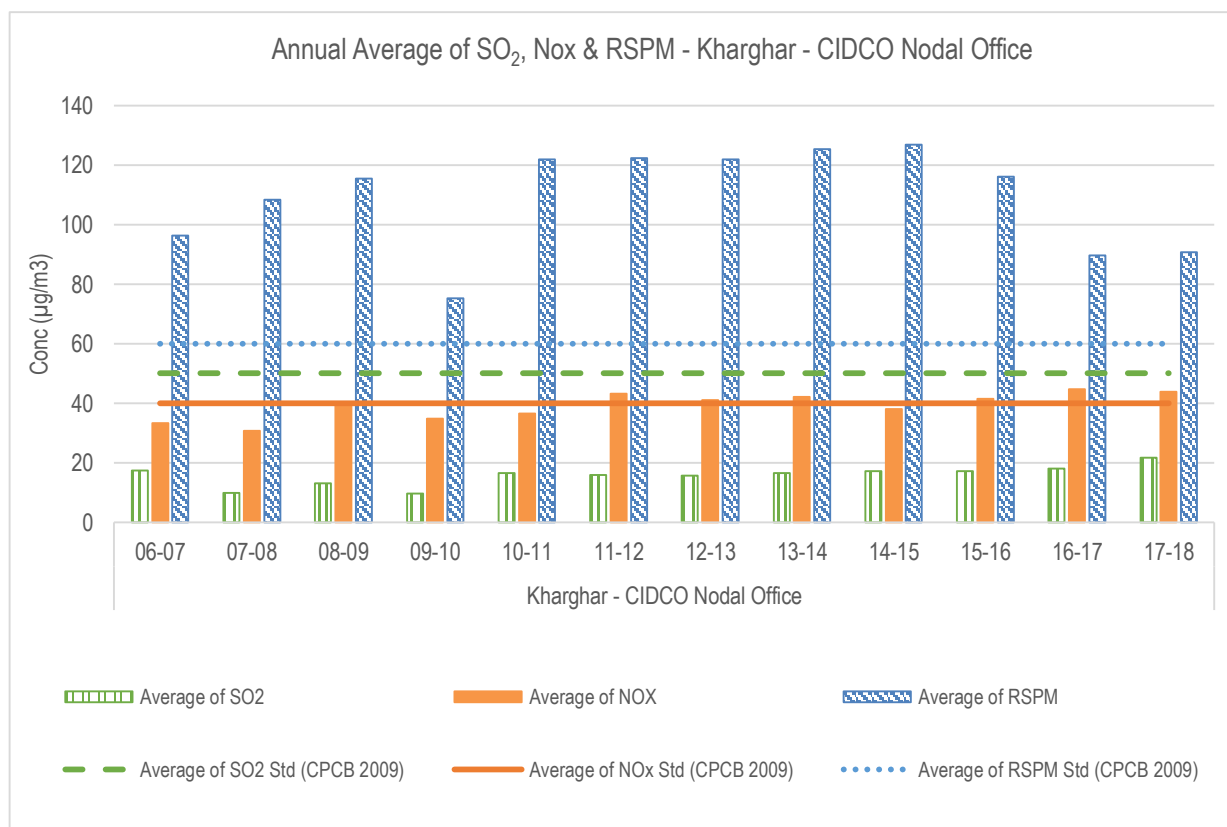


Figure No. 142: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Kharghar-CIDCO Nodel Office

## Taloja - MIDC Building

Table No. 142: Data for Monthly average reading recorded at Taloja - MIDC Building

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Taloja - MIDC Building	2017	Apr	29	63	188
		May	27	50	135
		Jun	25	52	108
		Jul	21	35	31
		Aug	19	38	59
		Sep	21	42	87
		Oct	22	39	107
		Nov	23	40	131
		Dec	26	53	125
	2018	Jan	21	48	126
		Feb	20	52	83
		Mar	25	59	82

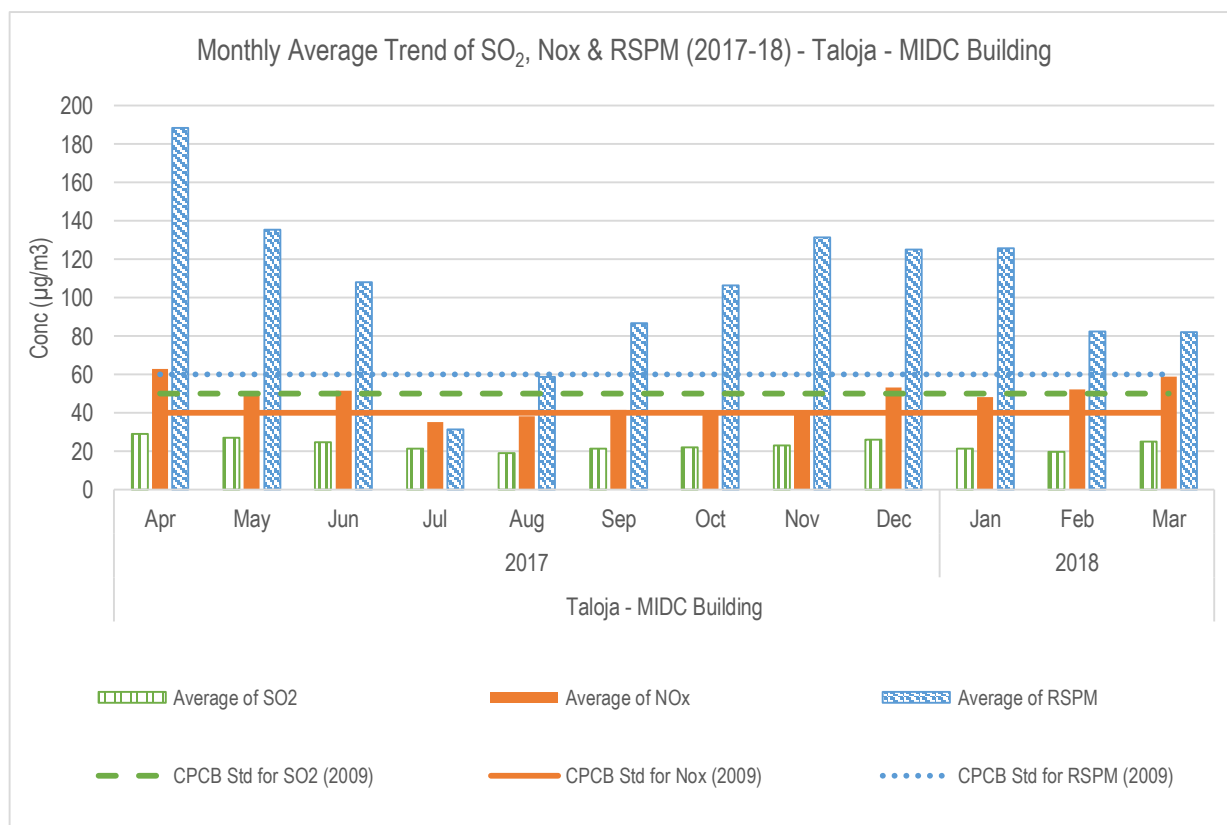


Figure No. 143: Monthly average reading recorded at Taloja -MIDC Building

Table No. 143: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Taloja -MIDC Building

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Taloja - MIDC Building	06-07	32	40	101
	07-08	22	39	113
	08-09	29	46	241
	09-10	23	55	200
	10-11	27	48	194
	11-12	20	51	148
	12-13	18	45	129
	13-14	19	47	187
	14-15	18	41	142
	15-16	21	47	148
	16-17	21	47	111
	17-18	23	47	105

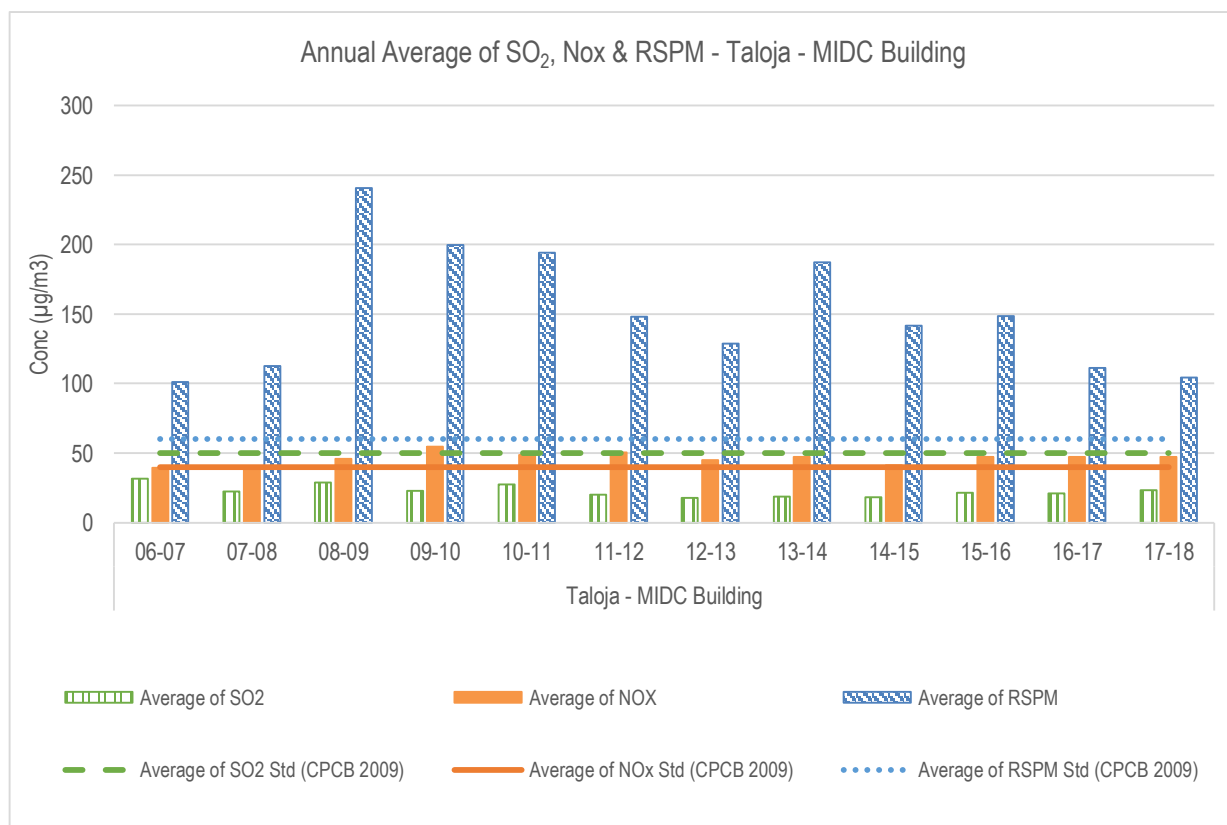
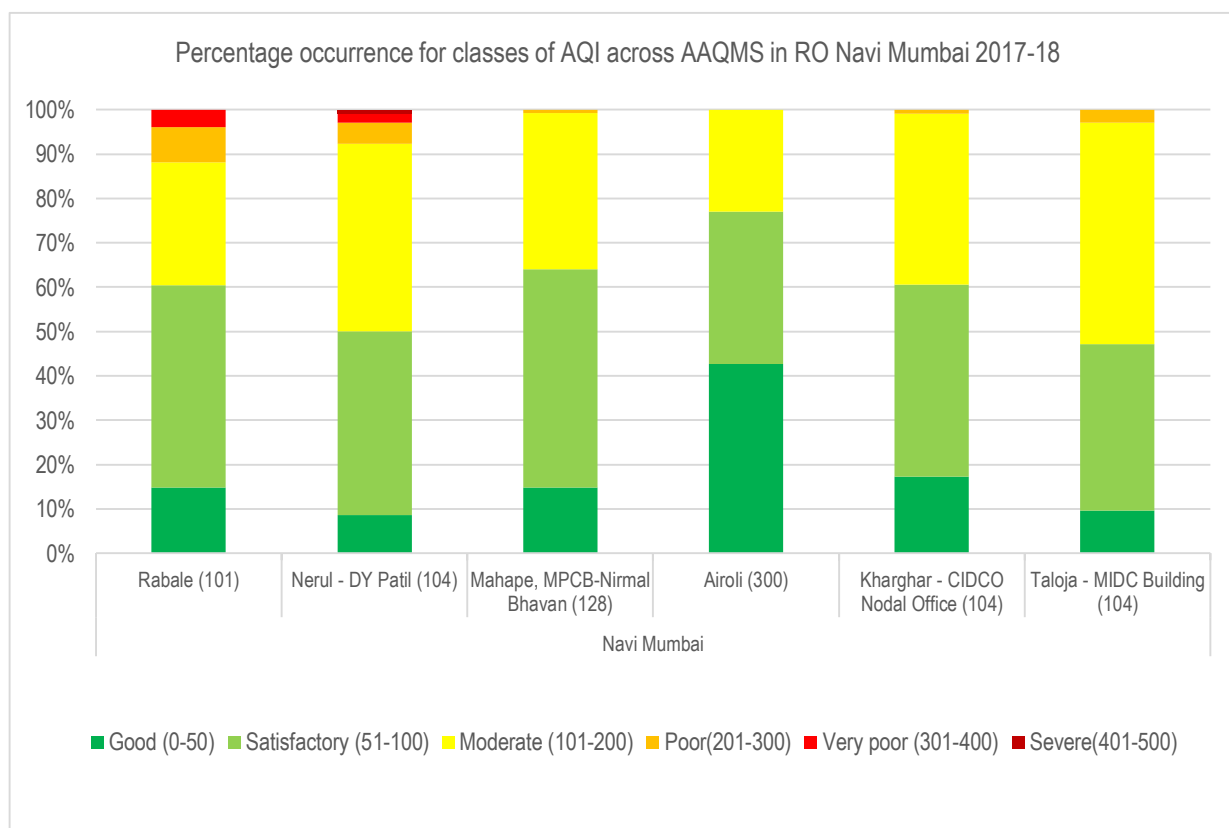


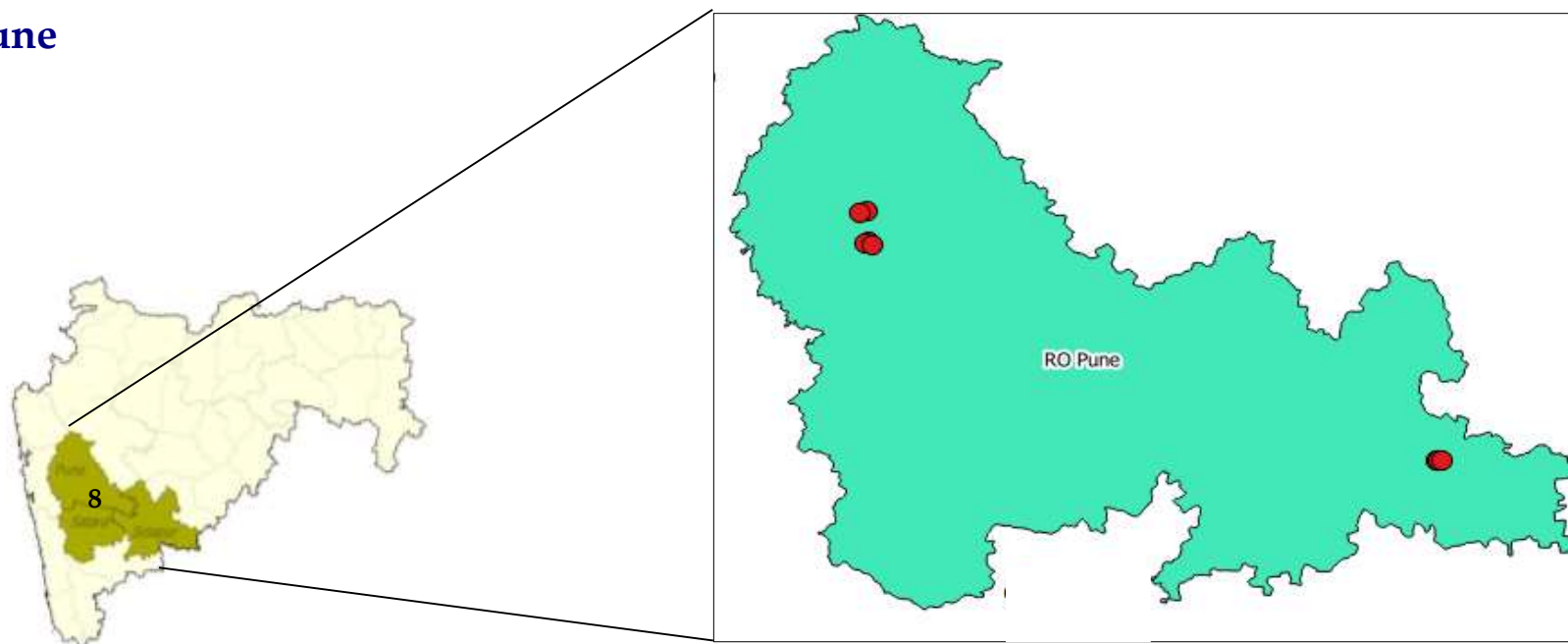
Figure No. 144: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Taloja -MIDC Building

**Table No. 144: Percentage exceedance of pollutants at Navi Mumbai RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Rabale	101	0	0	40	0	0	40
Nerul - DY Patil	104	0	0	52	0	0	50
Mahape, MPCB-Nirmal Bhavan	128	0	0	46	0	0	36
Airoli	300	0	1	69	0	0	23
Kharghar - CIDCO Nodal Office	104	0	0	41	0	0	39
Taloja - MIDC Building	104	0	0	55	0	0	53



## RO – Pune



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Pune	Pune	312	Bhosari	Industrial	18° 38' 04.1" N	73° 49' 42.0" E
	Pune	379	Nal Stop	Rural and other areas	18° 30' 25.2" N	73° 49' 39.2" E
	Pune	381	Swargate, Pune	Residential	18° 30' 12.6" N	73° 51' 09.4" E
	Pune	708	Pimpri-Chinchwad - BOB Building	Residential	18° 37' 41.0" N	73° 48' 17.0" E
	Pune		Karve Road - CAAQMS	Residential	18° 30' 45.1" N	73° 50' 22.6" E
	Solapur	299	WIT Campus	Residential	17° 40' 06.6" N	75° 55' 19.3" E
	Solapur	300	Saat Rasta- Chithale Clinic	Residential	17° 39' 57.6" N	75° 54' 23.4" E
	Solapur		Solapur	Residential	17° 40' 07.1" N	75° 54' 05.2" E

## Pune - Bhosari

Table No. 145: Data for Monthly average reading recorded at Bhosari

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Bhosari	2017	Apr	19	53	112
		May	26	41	82
		Jun	20	30	50
		Jul	14	42	33
		Aug	17	38	26
		Sep	18	43	39
		Oct	17	53	101
		Nov	25	75	139
		Dec	29	58	195
	2018	Jan	38	82	191
		Feb	27	89	187
		Mar	30	89	169

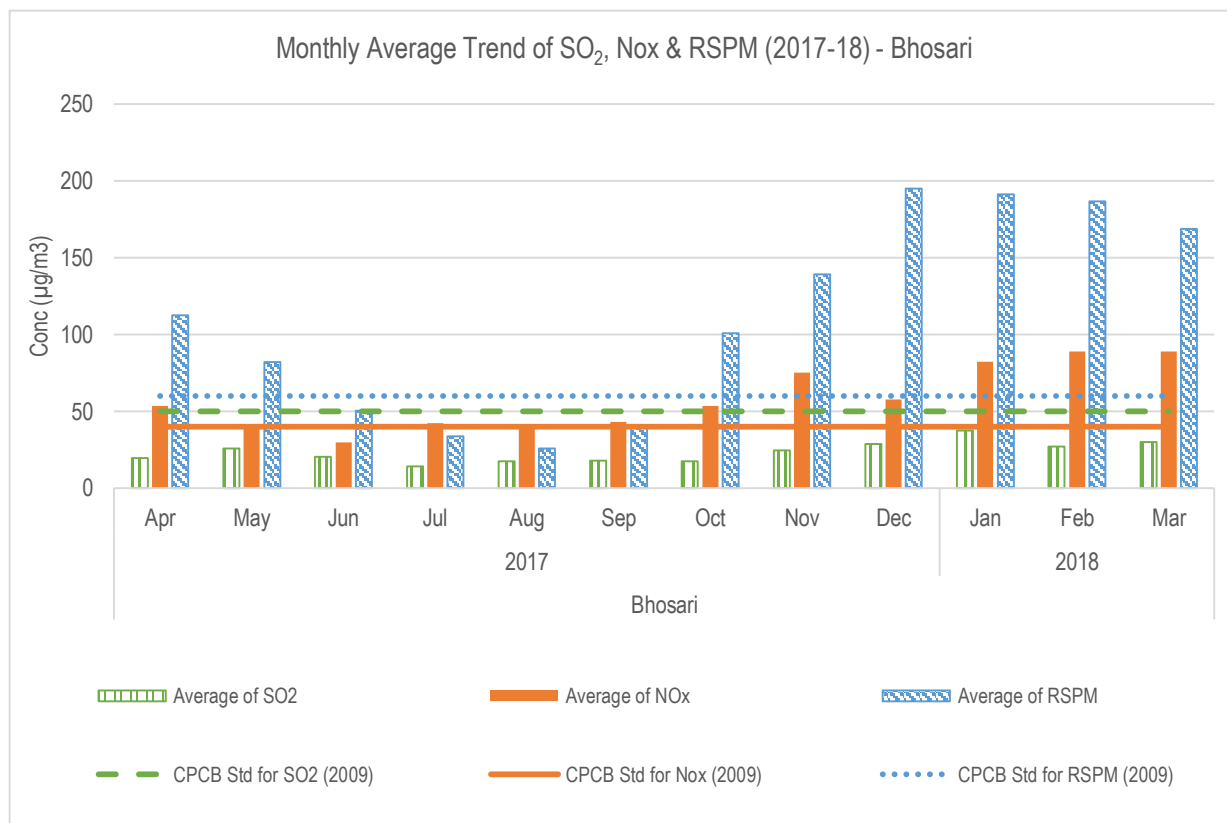


Figure No. 145: Monthly average reading recorded at Bhosari

Table No. 146: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Bhosari

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Bhosari	05-06	27	42	144
	06-07	24	42	126
	07-08	20	42	111
	08-09	24	37	109
	09-10	42	36	88
	10-11	30	38	84
	11-12	37	49	130
	12-13	25	39	101
	13-14	23	35	93
	14-15	26	47	101
	15-16	31	50	97
	16-17	28	67	115
	17-18	24	58	112

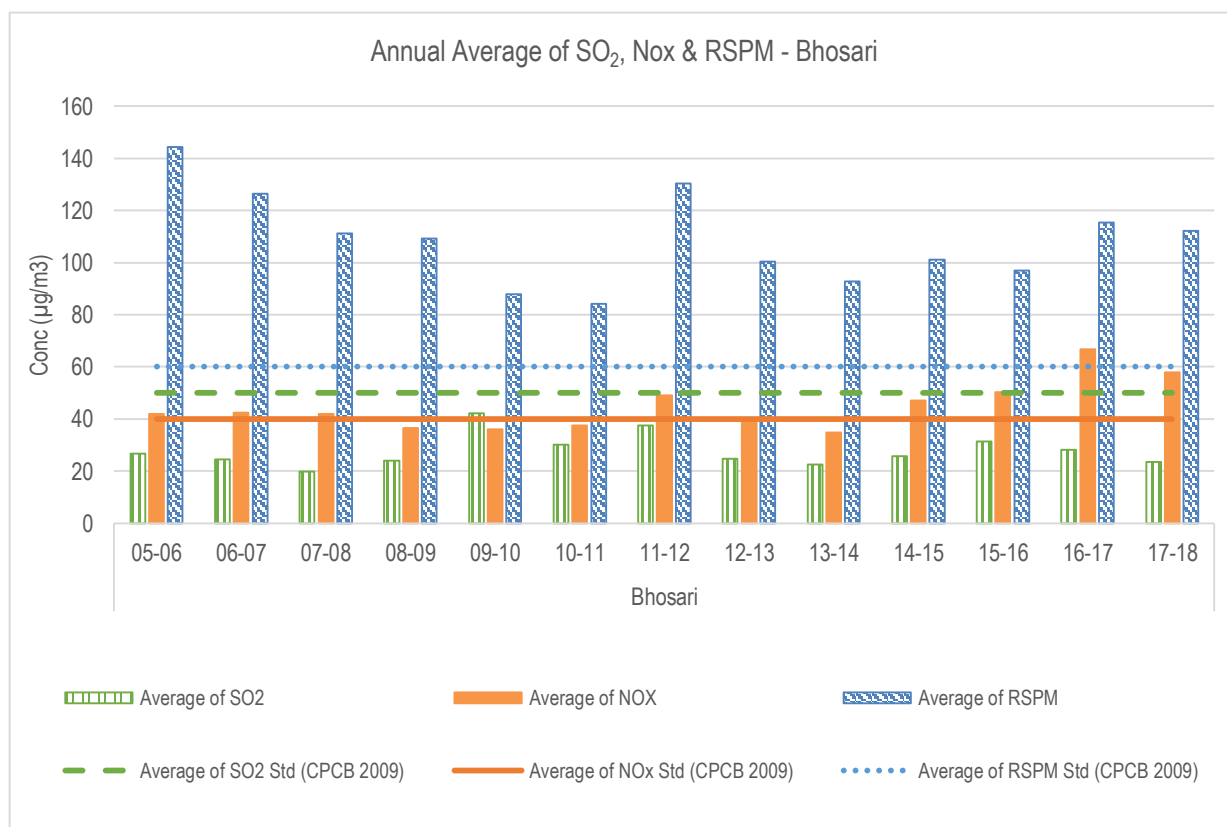


Figure No. 146: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Bhosari



## Pune - Nal Stop

Table No. 147: Data for Monthly average reading recorded at Nal Stop

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Nal Stop	2017	Apr	21	51	117
		May	25	57	91
		Jun	20	51	55
		Jul	13	46	60
		Aug	18	59	45
		Sep	21	46	65
		Oct	15	59	107
		Nov	21	72	122
		Dec	21	74	157
	2018	Jan	28	79	148
		Feb	22	147	175
		Mar	35	94	146

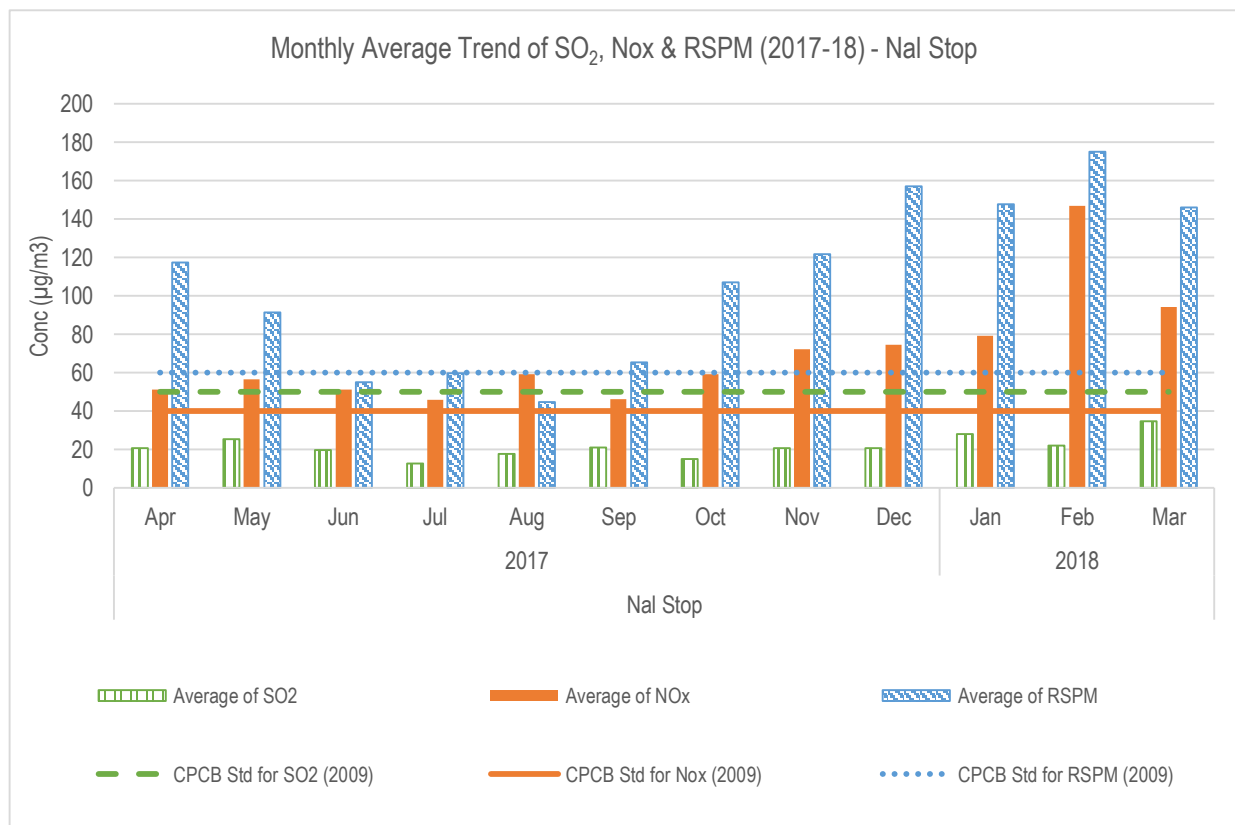


Figure No. 147: Monthly average reading recorded at Nal Stop

Table No. 148: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nal Stop

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Nal Stop	05-06	27	43	152
	06-07	23	42	129
	07-08	19	42	108
	08-09	21	41	91
	09-10	23	39	82
	10-11	21	43	88
	11-12	30	62	100
	12-13	19	45	82
	13-14	20	39	82
	14-15	22	48	92
	15-16	21	64	88
	16-17	23	78	107
	17-18	21	63	101

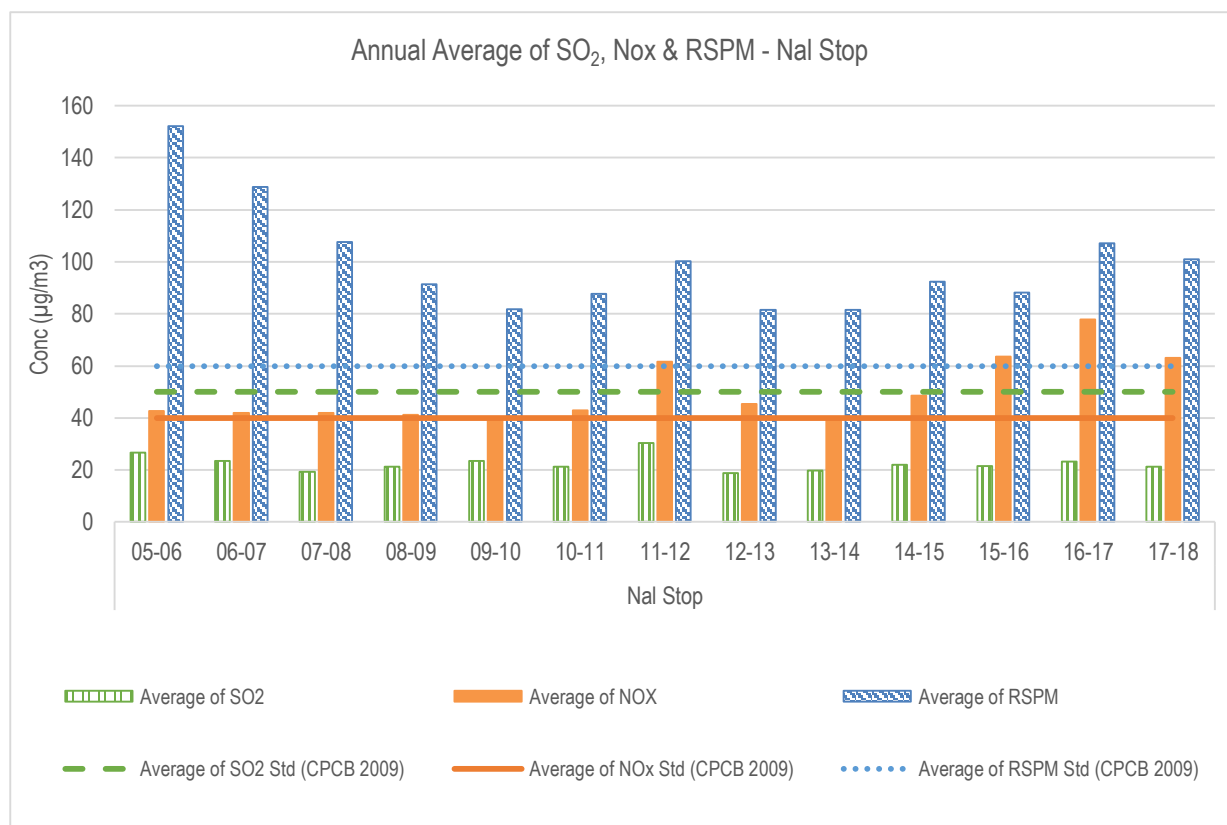


Figure No. 148: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Nal Stop

## Pune - Swargate, Pune

Table No. 149: Data for Monthly average reading recorded at Swargate, Pune

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Swargate, Pune	2017	Apr	22	64	90
		May	24	61	83
		Jun	21	59	67
		Jul	16	43	34
		Aug	19	36	24
		Sep	21	47	41
		Oct	21	61	94
		Nov	21	126	111
		Dec	22	77	109
	2018	Jan	26	93	113
		Feb	23	126	125
		Mar	32	91	98

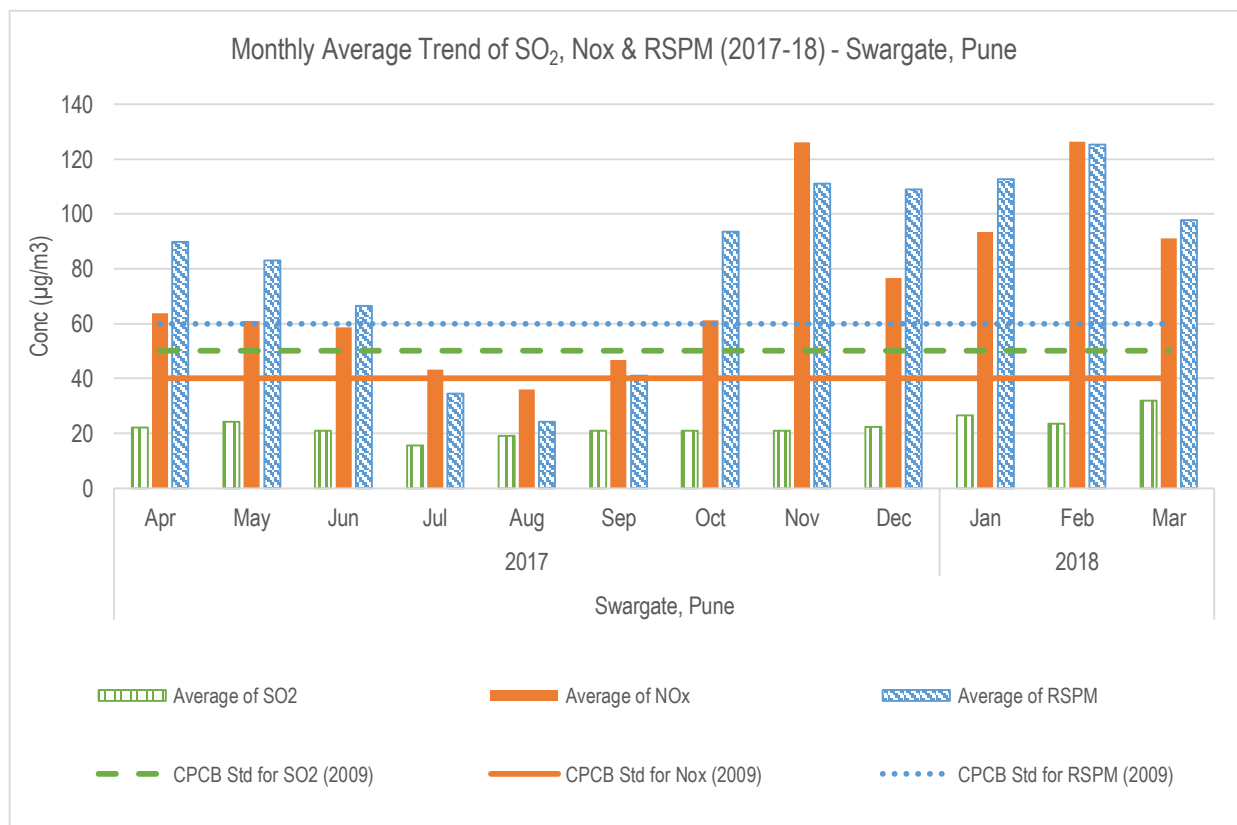


Figure No. 149: Monthly average reading recorded at Swargate, Pune

Table No. 150: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Swargate, Pune

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Swargate, Pune	05-06	27	43	152
	06-07	25	43	138
	07-08	20	46	101
	08-09	23	44	100
	09-10	24	39	81
	10-11	23	50	80
	11-12	28	63	95
	12-13	19	53	75
	13-14	21	42	75
	14-15	22	50	87
	15-16	21	66	106
	16-17	22	84	95
	17-18	22	73	86

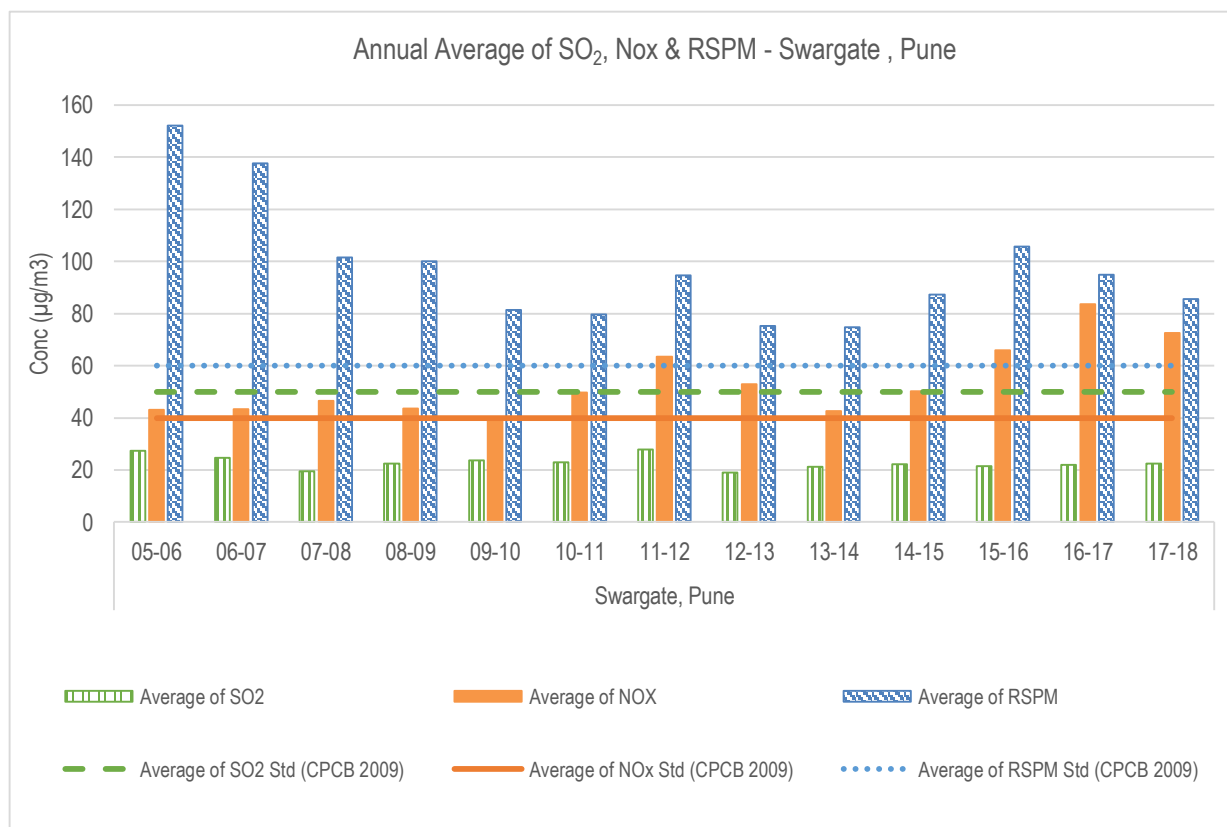


Figure No. 150: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Swargate, Pune

## Pune - Pimpri - Chinchwad-BOB Building

Table No. 151: Data for Monthly average reading recorded at Pimpri - Chinchwad-BOB Building

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Pimpri-Chinchwad - BOB Building	2017	Apr	25	38	82
		May	26	55	74
		Jun	19	30	57
		Jul	17	32	35
		Aug	17	37	29
		Sep	20	41	29
		Oct	16	54	104
		Nov	21	77	116
		Dec	31	79	121
	2018	Jan	29	72	146
		Feb	26	99	141
		Mar	44	80	114

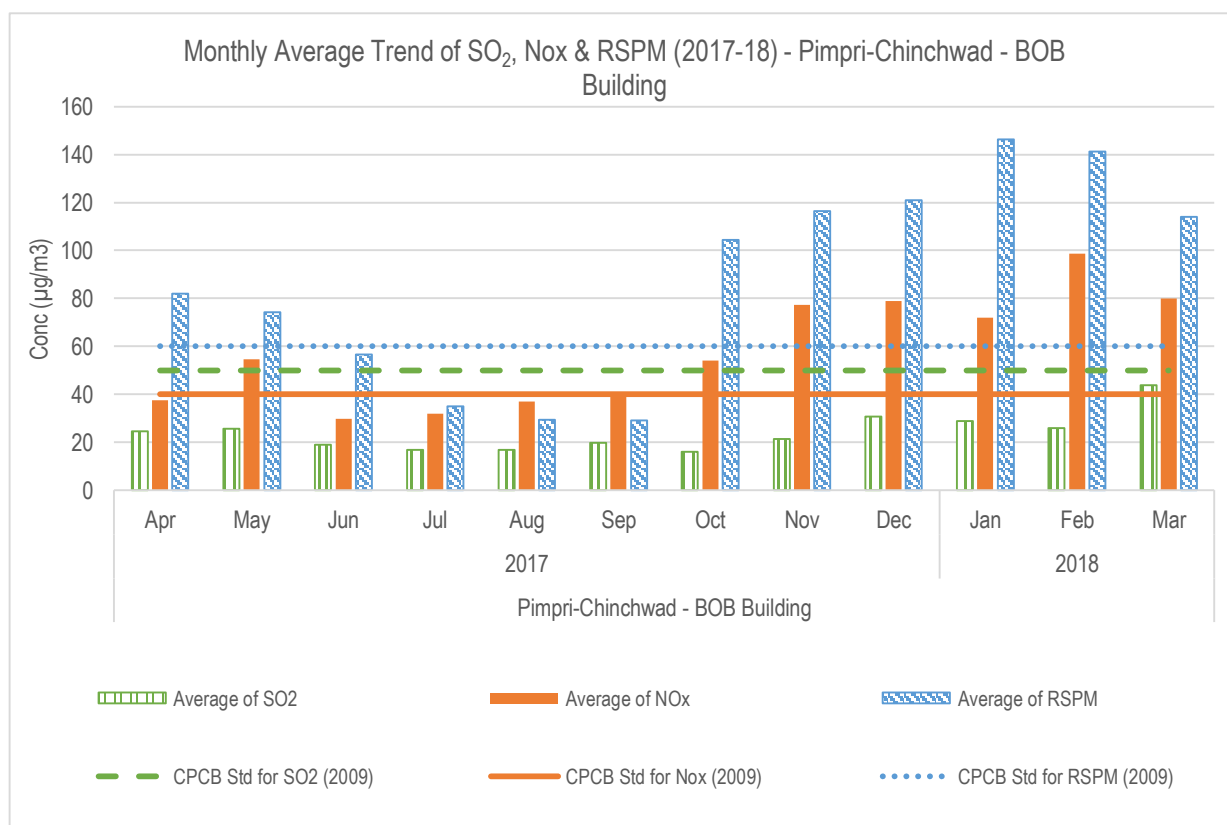


Figure No. 151: Monthly average reading recorded at Pimpri - Chinchwad-BOB Building

Table No. 152: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Pimpri - Chinchwad-BOB Building

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Pimpri-Chinchwad - BOB Building	05-06	21	35	114
	06-07	24	42	127
	07-08	19	41	105
	08-09	23	39	96
	09-10	31	43	89
	10-11	26	49	86
	11-12	33	57	117
	12-13	20	49	84
	13-14	22	39	82
	14-15	22	44	94
	15-16	27	52	101
	16-17	27	72	87
	17-18	24	57	87

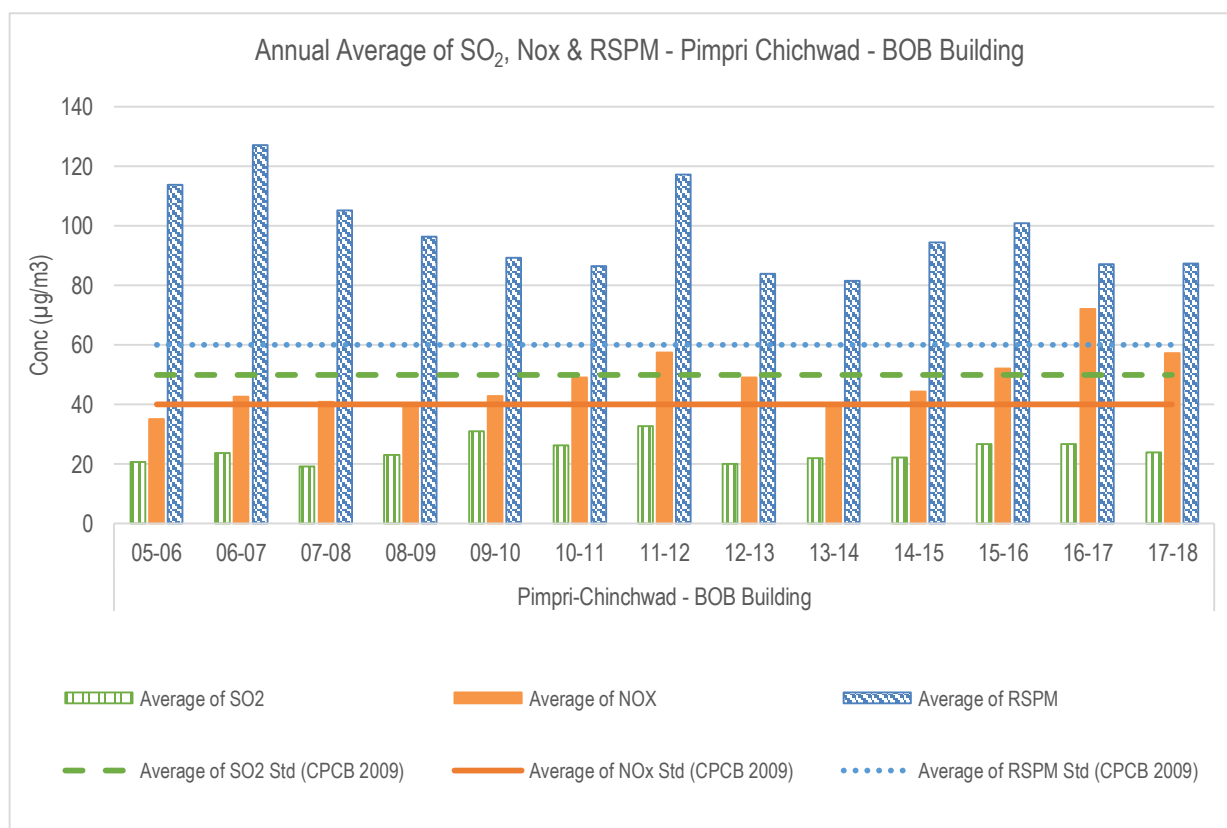


Figure No. 152: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Pimpri - Chinchwad-BOB Building

## Pune - Karve Road - CAAQMS

Table No. 153: Data for Monthly average reading recorded at Karve Road - CAAQMS

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Karve Road - CAAQMS	2017	Apr	20	50	77
		May	37	31	57
		Jun	10	37	23
		Jul	12	40	33
		Aug	33	49	39
		Sep	29	48	45
		Oct	27	49	76
		Nov	27	51	107
		Dec	27	48	109
	2018	Jan	23	43	81
		Feb	21	44	110
		Mar	25	62	121

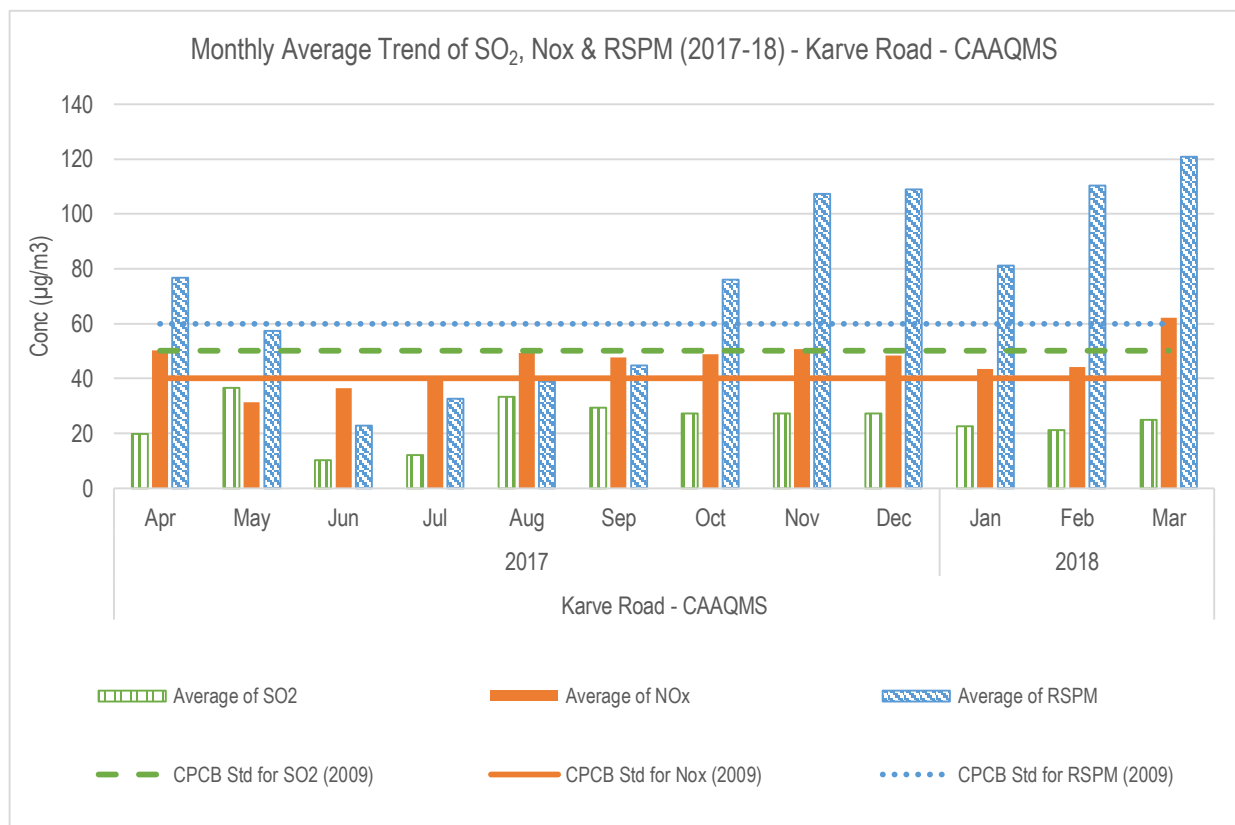
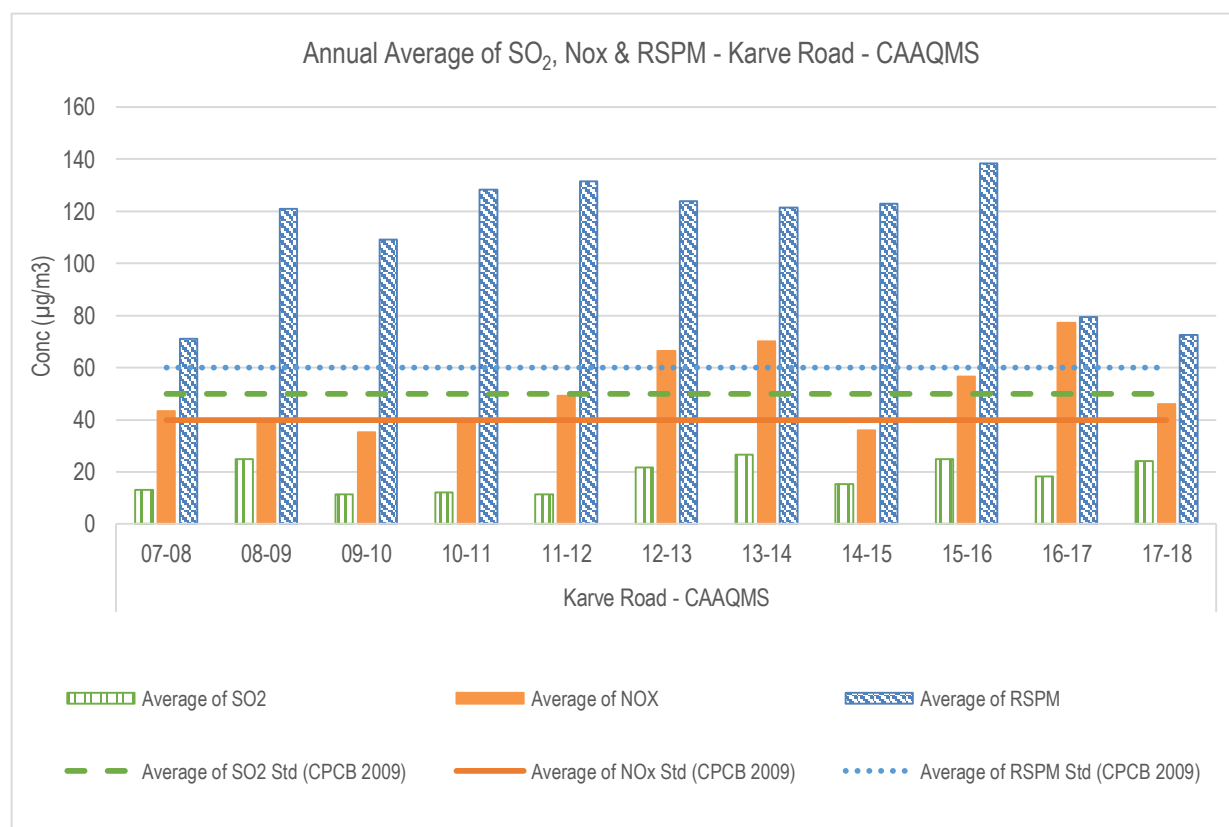


Figure No. 153: Monthly average reading recorded at Karve Road – CAAQMS

**Table No. 154: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Karve Road - CAAQMS**

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Karve Road - CAAQMS	07-08	13	43	71
	08-09	25	39	121
	09-10	11	35	109
	10-11	12	39	128
	11-12	11	49	131
	12-13	22	66	124
	13-14	27	70	121
	14-15	15	36	123
	15-16	25	57	138
	16-17	18	77	79
	17-18	24	46	73



**Figure No. 154: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Karve Road - CAAQMS**



## Solapur - WIT Campus

Table No. 155: Data for Monthly average reading recorded at WIT Campus

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
WIT Campus	2017	Apr	14	34	66
		May	12	26	55
		Jun	13	28	58
		Jul	13	31	62
		Aug	14	33	68
		Sep	15	33	62
		Oct	15	34	59
		Dec	14	34	70
	2018	Jan	16	36	73
		Feb	15	35	73
		Mar	15	34	73

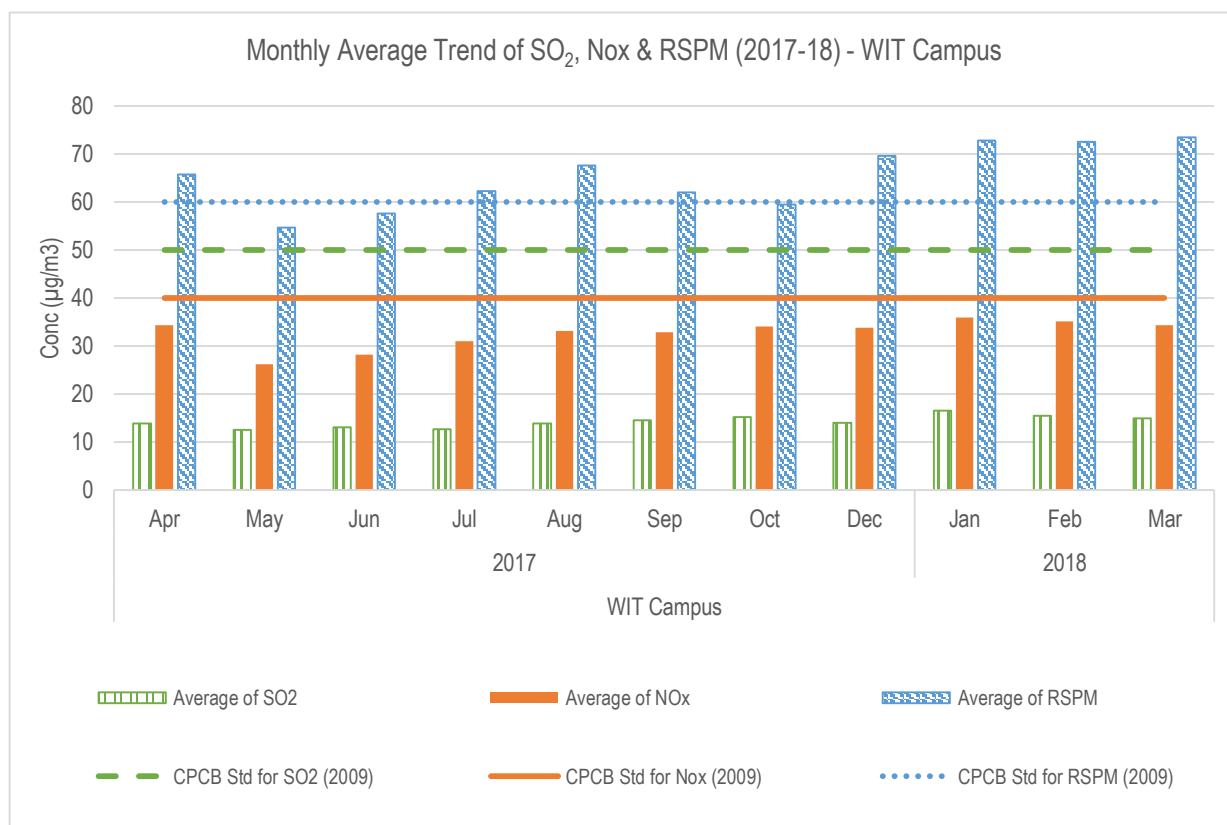


Figure No. 155: Monthly average reading recorded at WIT Campus

Table No. 156: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at WIT Campus

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
WIT Campus	04-05	18	40	137
	05-06	17	37	115
	06-07	16	35	97
	07-08	17	34	86
	08-09	17	35	76
	09-10	17	35	71
	10-11	17	35	74
	11-12	17	35	77
	12-13	17	35	78
	13-14	15	35	84
	14-15	14	34	77
	15-16	13	35	76
	16-17	13	34	69
	17-18	14	33	65

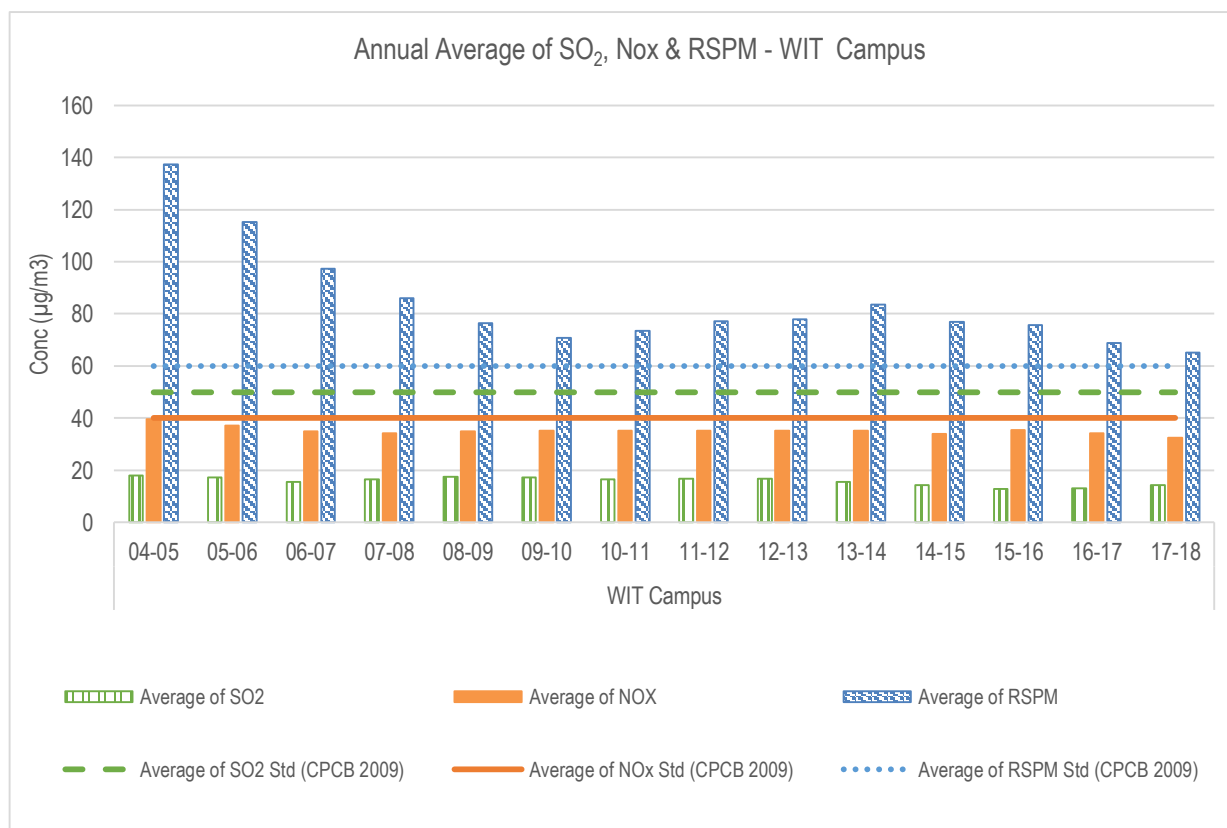


Figure No. 156: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at WIT Campus

## Solapur - Saat Rasta - Chithale Clinic

Table No. 157: Data for Monthly average reading recorded at Saat Rasta - Chithale Clinic

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Saat Rasta- Chithale Clinic	2017	Apr	11	38	76
		May	13	26	64
		Jun	13	28	60
		Jul	13	30	70
		Aug	13	31	64
		Sep	14	33	62
		Oct	15	34	60
		Dec	16	73	116
	2018	Jan	17	45	84
		Feb	17	49	89
		Mar	17	40	79

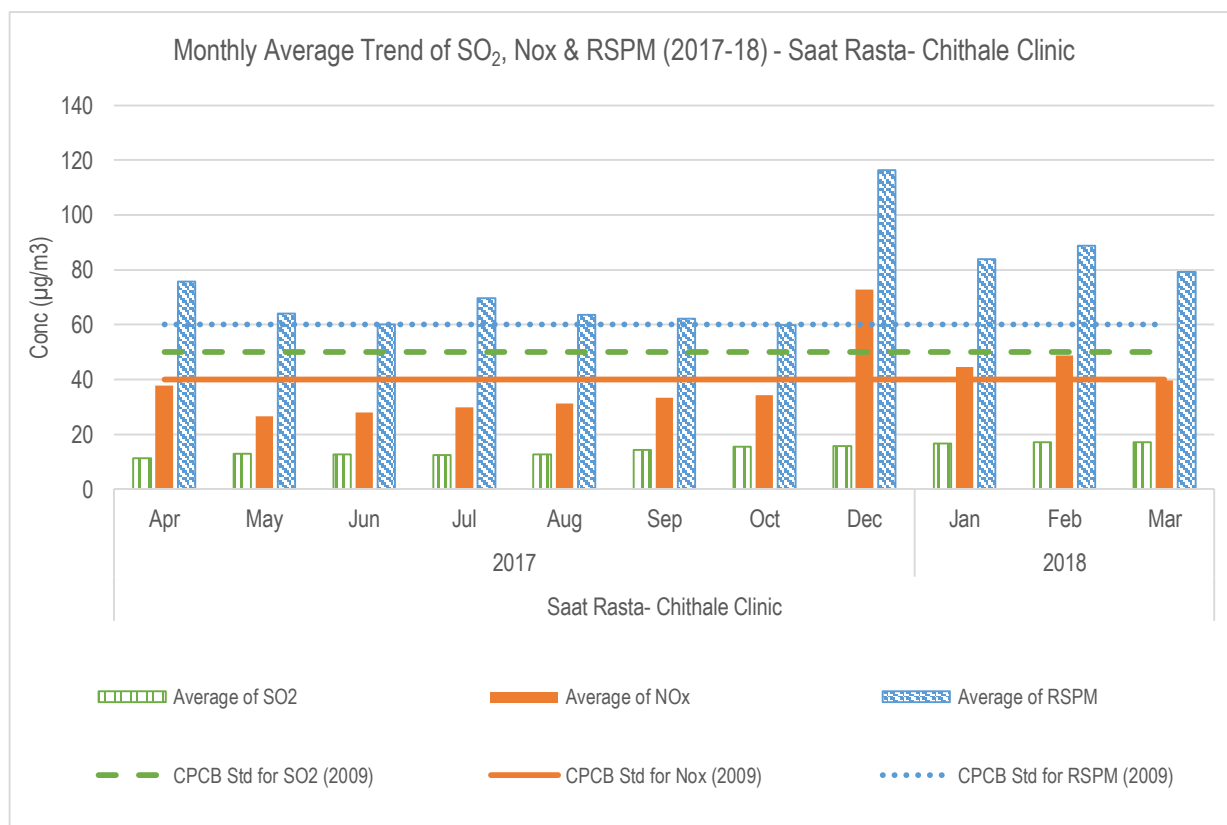


Figure No. 157: Monthly average reading recorded at Saat Rasta - Chithale Clinic

Table No. 158: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Saat Rasta - Chithale Clinic

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Saat Rasta- Chithale Clinic	04-05	18	40	144
	05-06	18	38	125
	06-07	17	36	107
	07-08	18	34	96
	08-09	18	36	74
	09-10	17	36	66
	10-11	17	34	69
	11-12	17	35	77
	12-13	17	35	81
	13-14	16	35	77
	14-15	14	35	78
	15-16	13	37	78
	16-17	13	35	70
	17-18	14	41	77

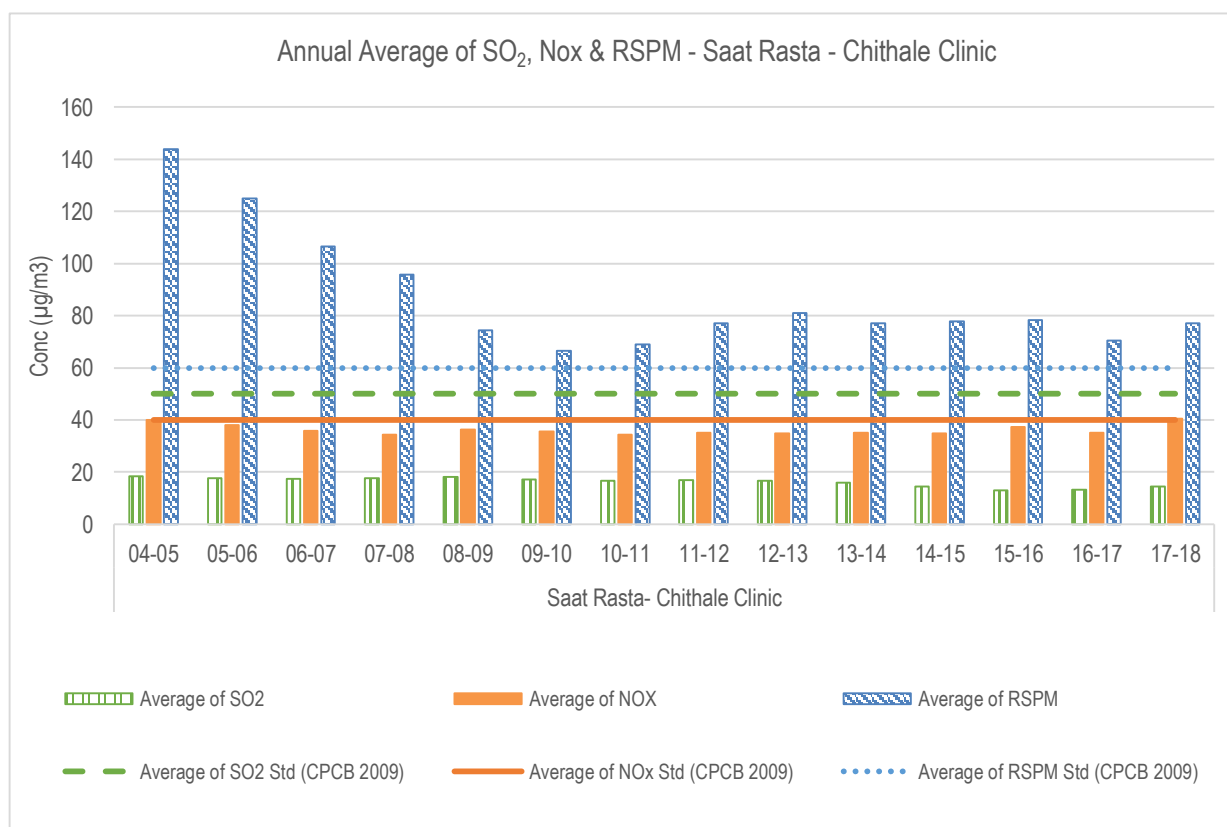


Figure No. 158: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Saat Rasta - Chithale Clinic

## Solapur - Solapur

Table No. 159: Data for Monthly average reading recorded at Solapur

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Solapur	2017	Apr	13	46	115
		May	13	54	81
		Jun	14	36	40
		Jul	16	35	51
		Aug	22	36	44
		Sep	22	43	51
		Oct	26	61	89
		Nov	27	70	125
		Dec	18	99	145
	2018	Jan	18	124	167
		Feb	19	110	141
		Mar	19	96	123

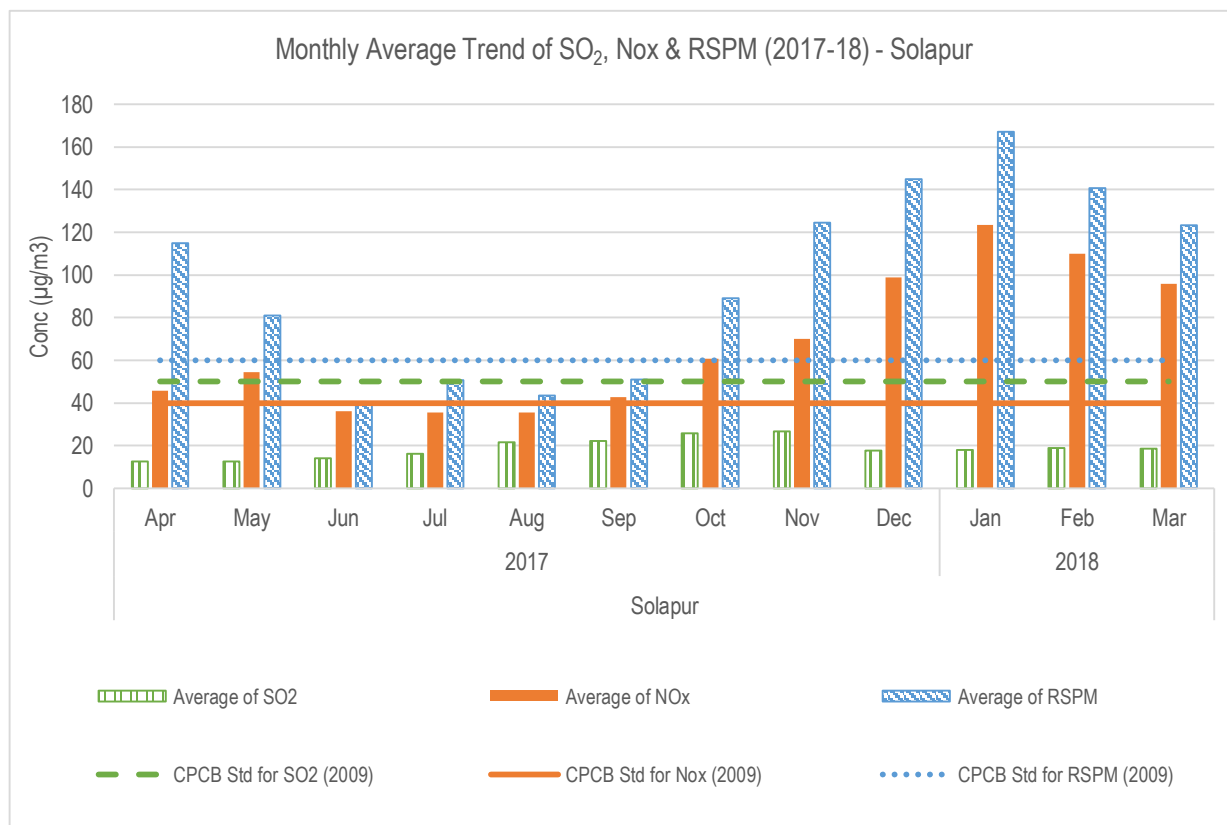


Figure No. 159: Monthly average reading recorded at Solapur

Table No. 160: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Solapur

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Solapur	07-08	15	31	102
	08-09	15	30	96
	10-11	13	37	112
	11-12	12	40	116
	12-13	16	42	106
	13-14	15	42	96
	14-15	9	38	104
	15-16	13	49	100
	16-17	15	41	106
	17-18	19	67	96

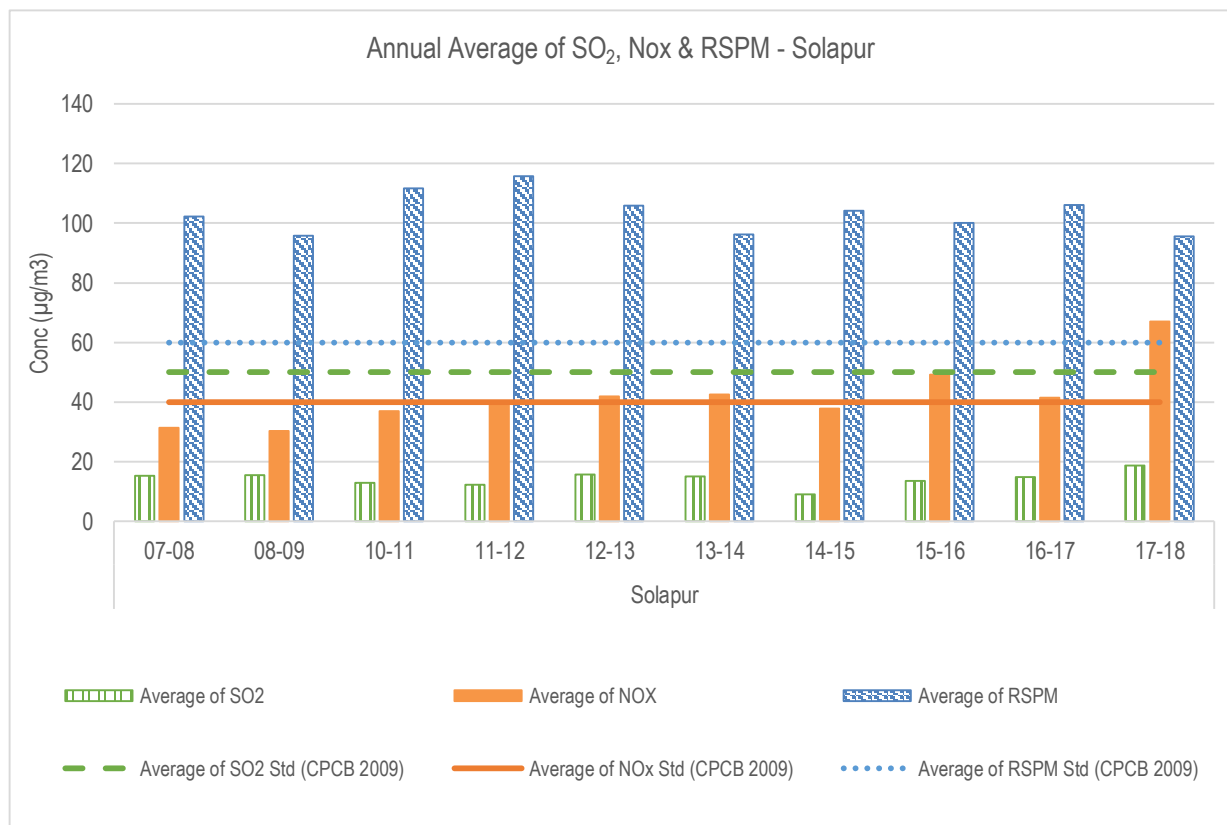
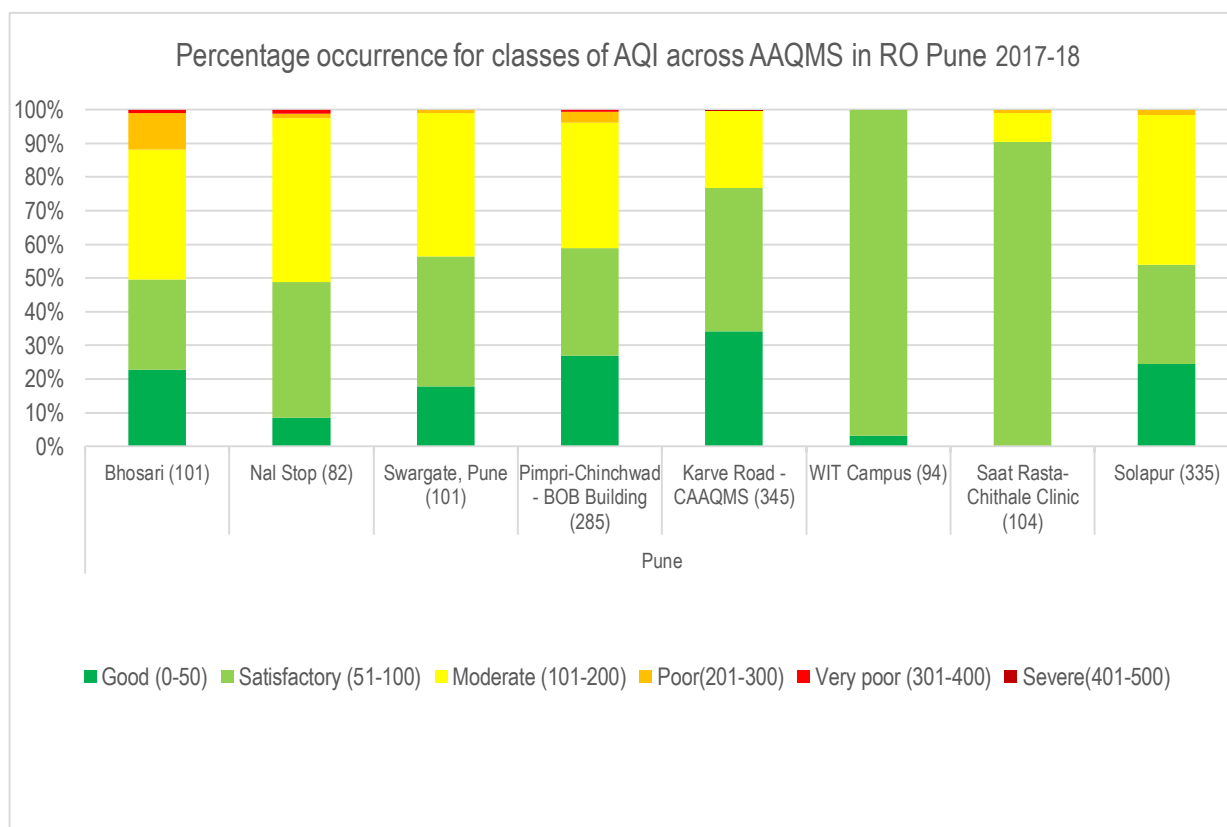


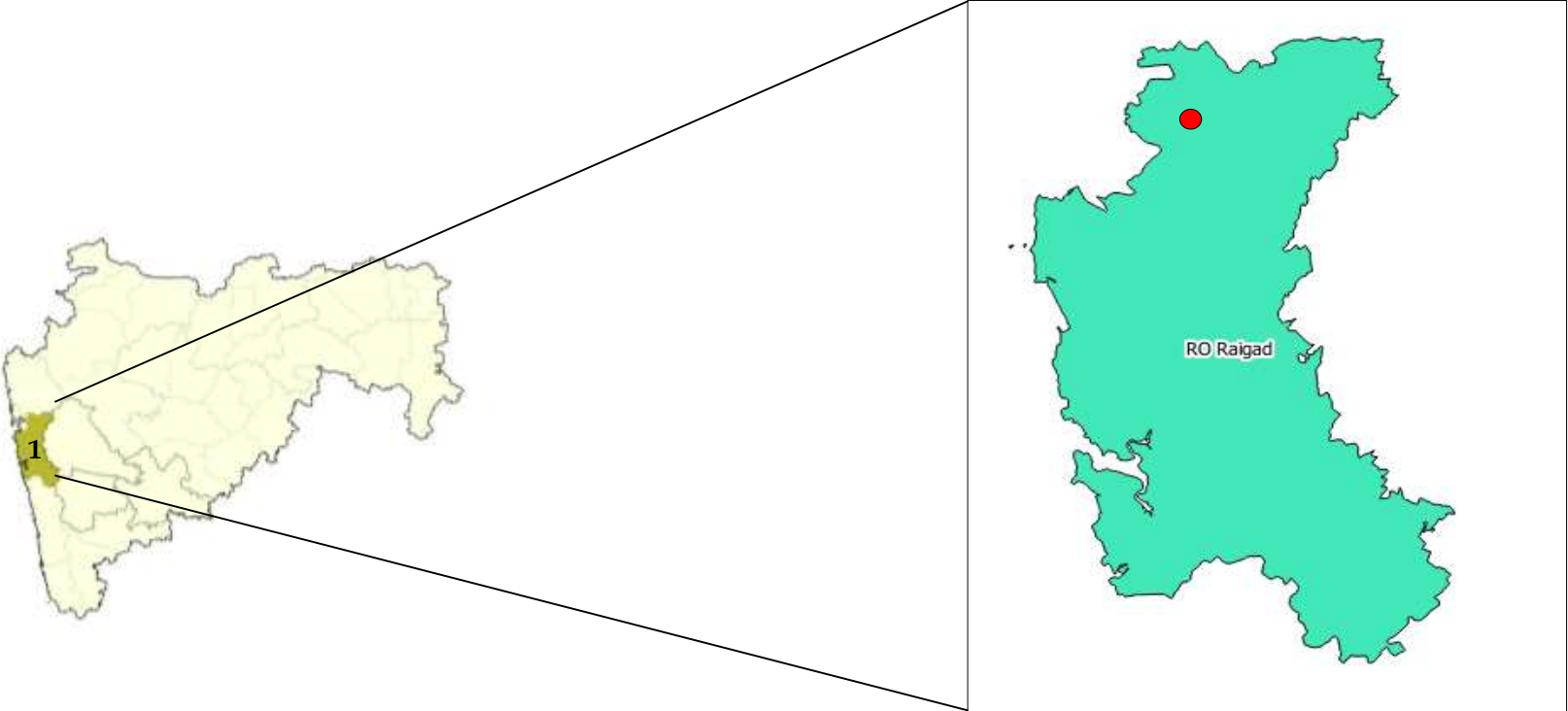
Figure No. 160: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Solapur

**Table No. 161: Percentage exceedance of pollutants at Pune RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Bhosari	101	0	22	51	0	22	50
Nal Stop	82	0	13	42	0	16	51
Swargate, Pune	101	0	37	37	0	37	37
Pimpri-Chinchwad - BOB Building	285	0	60	111	0	21	39
Karve Road - CAAQMS	345	2	1	78	1	0	23
WIT Campus	94	0	0	0	0	0	0
Saat Rasta- Chithale Clinic	104	0	7	10	0	7	10
Solapur	335	0	105	153	0	31	46



# RO - Raigad



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Raigad	Panvel	495	Panvel- Water Supply Plant	Residential	18° 59' 23.8" N	73° 07' 03.5" E



## Panvel - Panvel – Water Supply Plant

Table No. 162: Data for Monthly average reading recorded at Panvel – Water Supply Plant

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Panvel- Water Supply Plant	2017	Apr	26	56	194
		May	22	45	148
		Jun	20	58	111
		Jul	19	38	37
		Aug	19	37	47
		Sep	27	41	88
		Oct	25	40	111
		Nov	25	51	107
		Dec	24	49	130
	2018	Jan	22	47	115
		Feb	19	52	73
		Mar	20	50	81

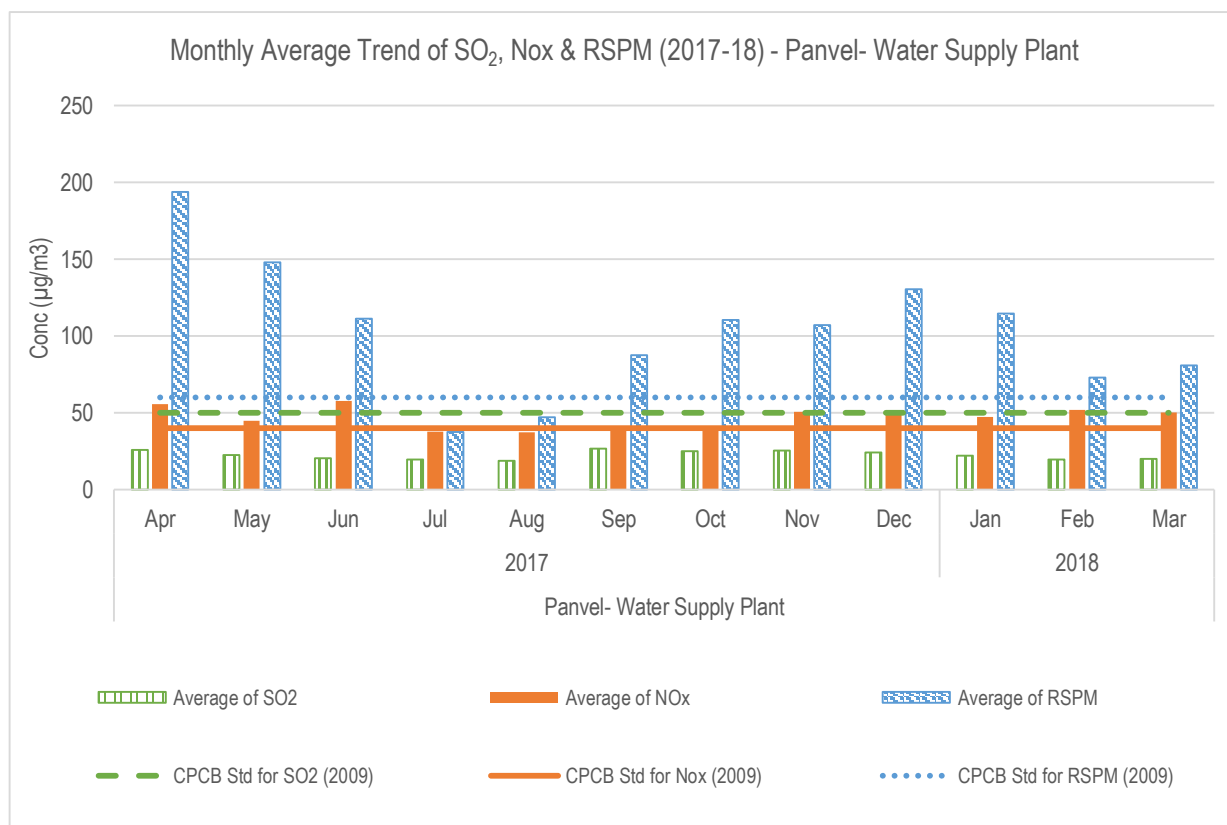
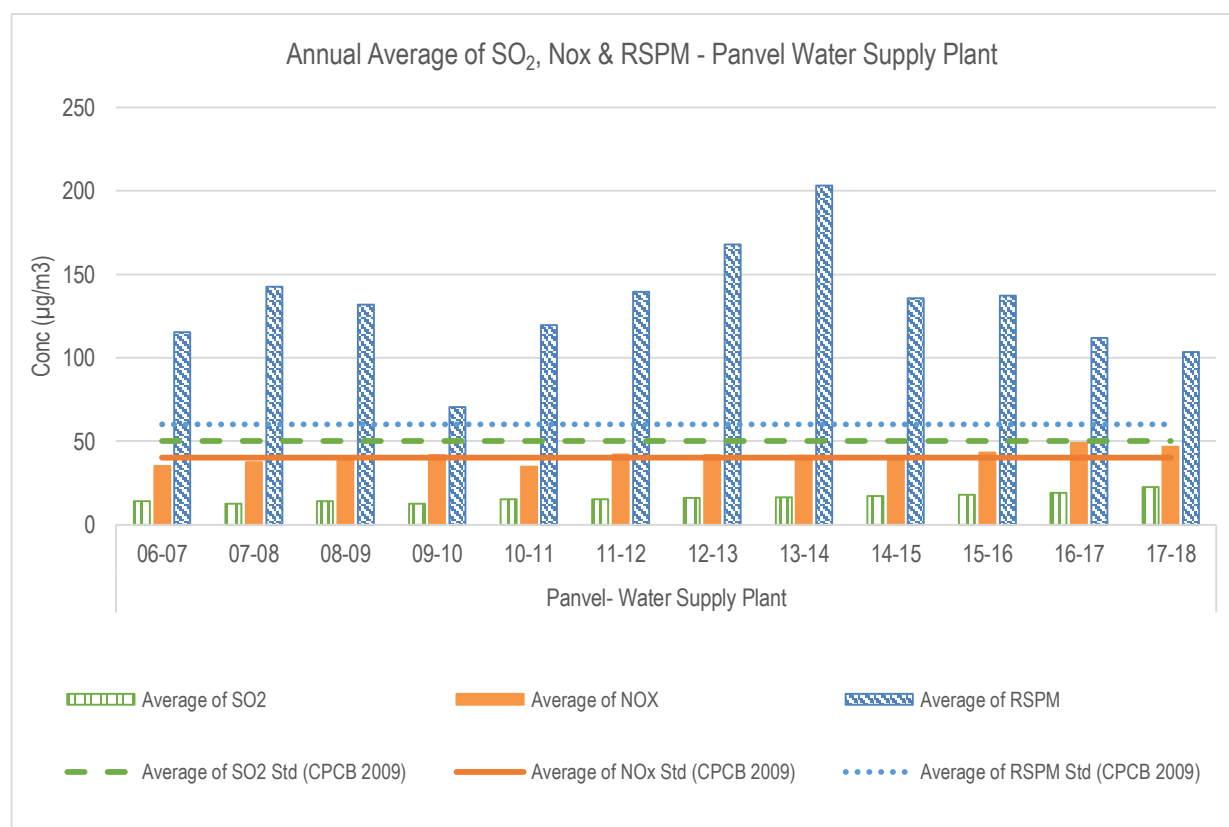


Figure No. 161: Monthly average reading recorded at Panvel – Water Supply Plant

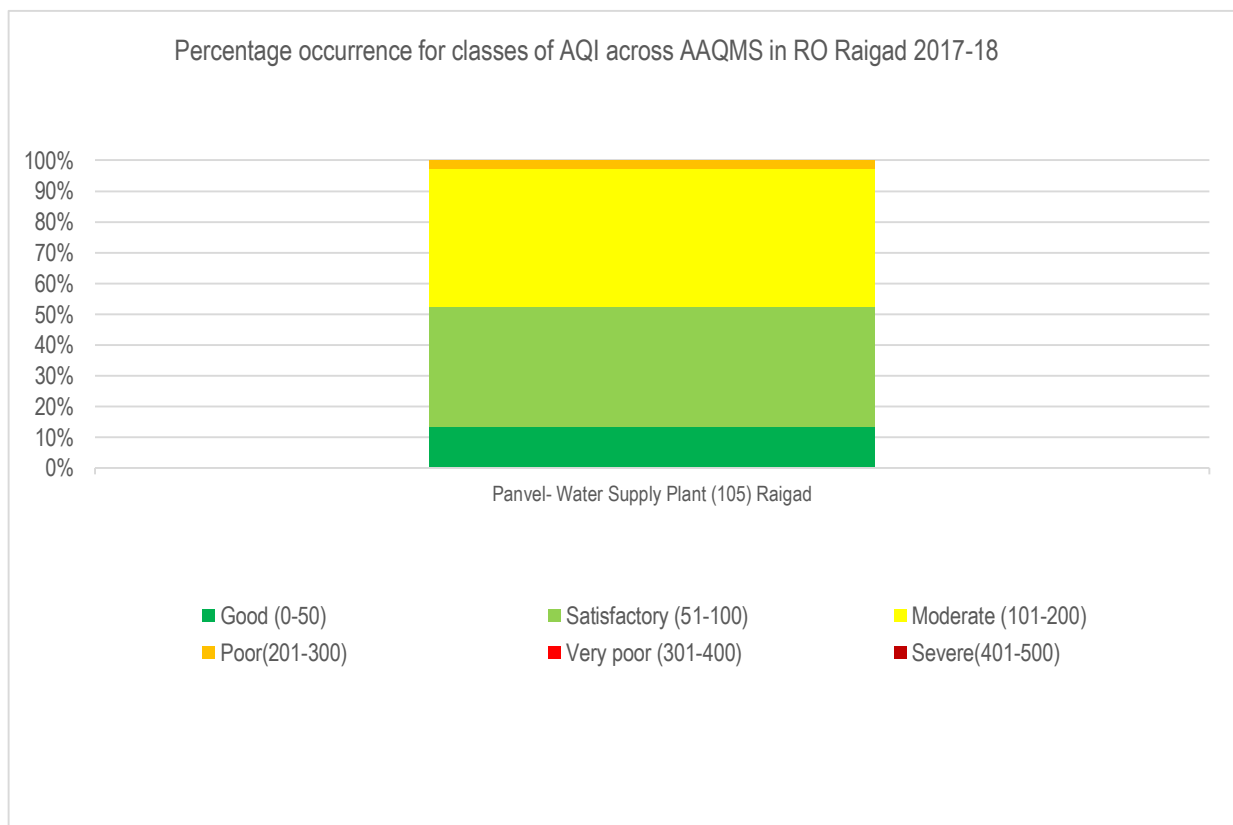
Table No. 163: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Panvel – Water Supply Plant

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Panvel- Water Supply Plant	06-07	14	35	115
	07-08	12	37	143
	08-09	14	40	132
	09-10	12	42	71
	10-11	15	35	119
	11-12	15	42	140
	12-13	16	42	168
	13-14	16	41	203
	14-15	17	38	136
	15-16	18	43	137
	16-17	19	49	112
	17-18	22	47	104

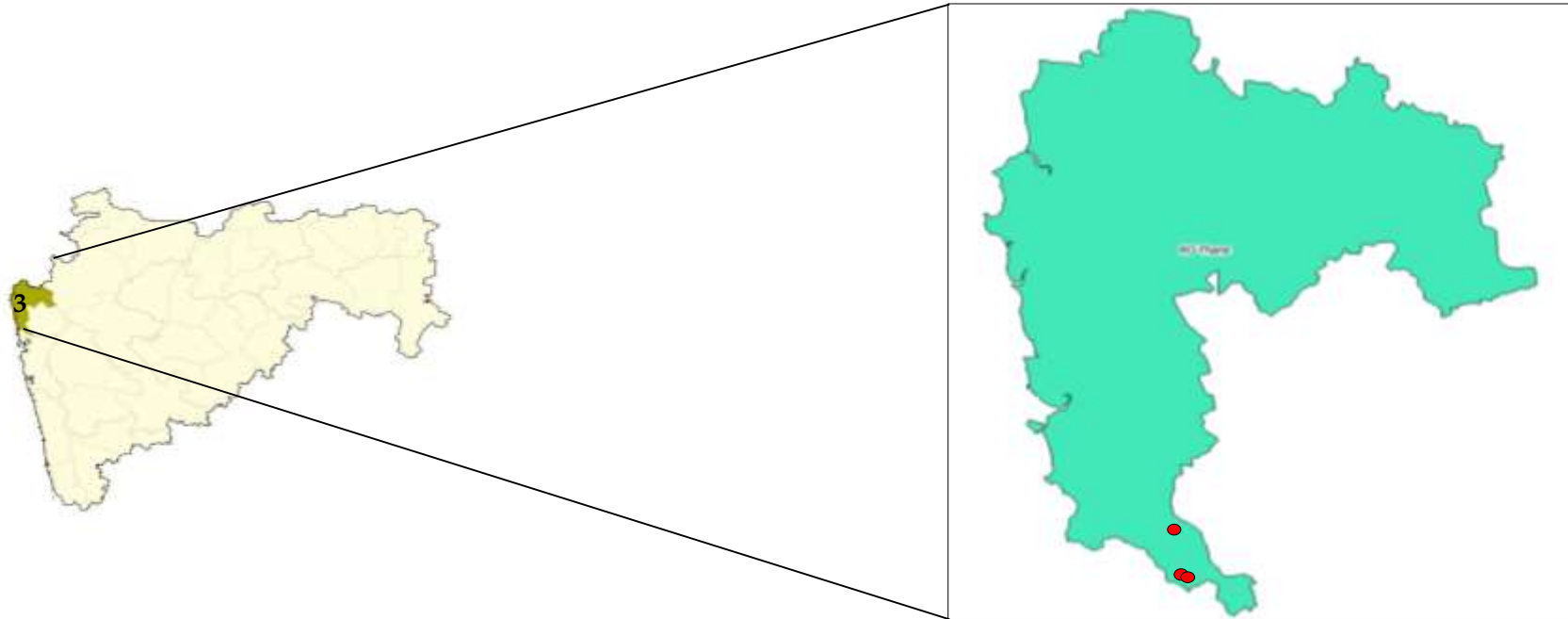
Figure No. 162: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Panvel – Water Supply Plant

**Table No. 164: Percentage exceedance of pollutants at Raigad RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
Panvel- Water Supply Plant	105	0	0	50	0	0	48



## RO - Thane



MPCB RO	Region	Station code	Station name	Type	Latitude (deg)	Longitude (deg)
Thane	Thane	303	Kopri	Residential	19° 10' 55.3" N	72° 58' 17.1" E
	Thane	304	Naupada	Rural and other areas	19° 11' 17.4" N	72° 58' 04.1" E
	Thane		Balkum/Glaxo	Industrial	19° 13' 05.8" N	72° 57' 59.7" E

## Thane - Kopri

Table No. 165: Data for Monthly average reading recorded at Kopri

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Kopri	2017	Apr	23	57	136
		May	21	59	111
		Jun	15	52	114
		Jul	11	37	117
		Aug	12	25	73
		Sep	15	27	80
		Oct	22	39	145
		Nov	26	44	164
		Dec	18	50	128
	2018	Jan	22	57	142
		Feb	21	54	136
		Mar	22	52	115

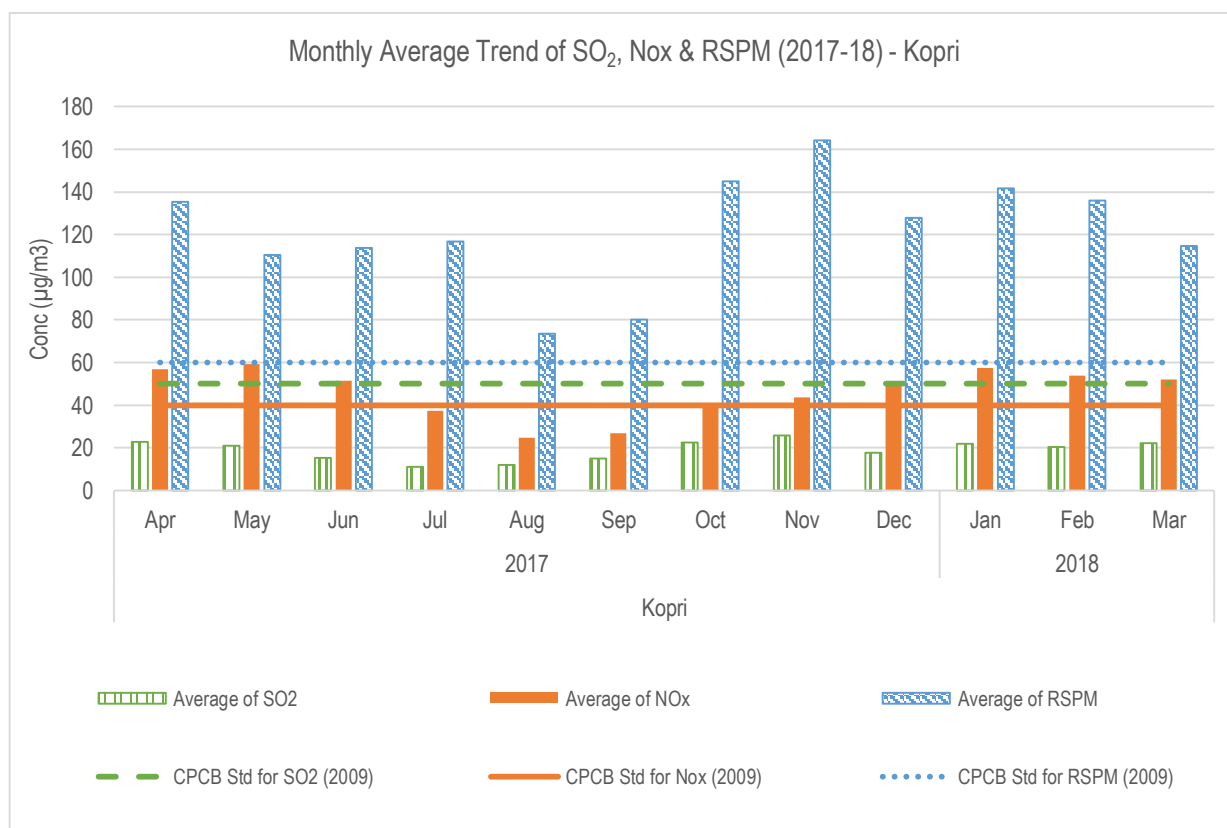


Figure No. 163: Monthly average reading recorded at Kopri

Table No. 166: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Kopri

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Kopri	04-05	8	11	45
	05-06	6	9	51
	06-07	12	10	51
	07-08	11	10	50
	08-09	11	16	60
	09-10	11	13	50
	10-11	12	11	46
	11-12	12	9	60
	12-13	20	15	86
	13-14	16	41	114
	14-15	21	61	106
	15-16	27	62	136
	16-17	18	59	117
	17-18	19	46	121

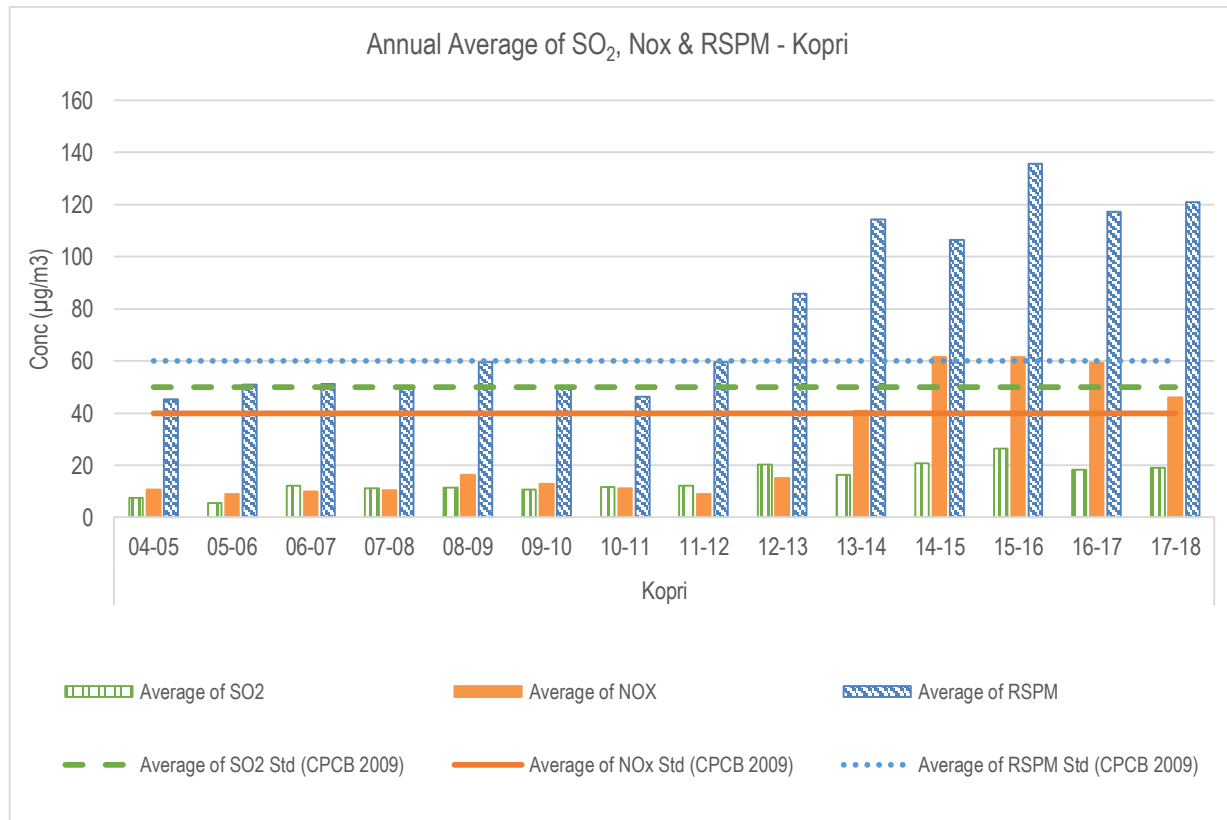


Figure No. 164: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Kopri

## Thane - Naupada

Table No. 167: Data for Monthly average reading recorded at Naupada

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Naupada	2017	Apr	24	66	136
		May	22	64	92
		Jun	16	54	111
		Jul	11	34	79
		Aug	11	22	60
		Sep	13	24	79
		Oct	22	35	119
		Nov	27	42	143
		Dec	22	56	168
	2018	Jan	22	60	167
		Feb	23	60	138
		Mar	22	57	136

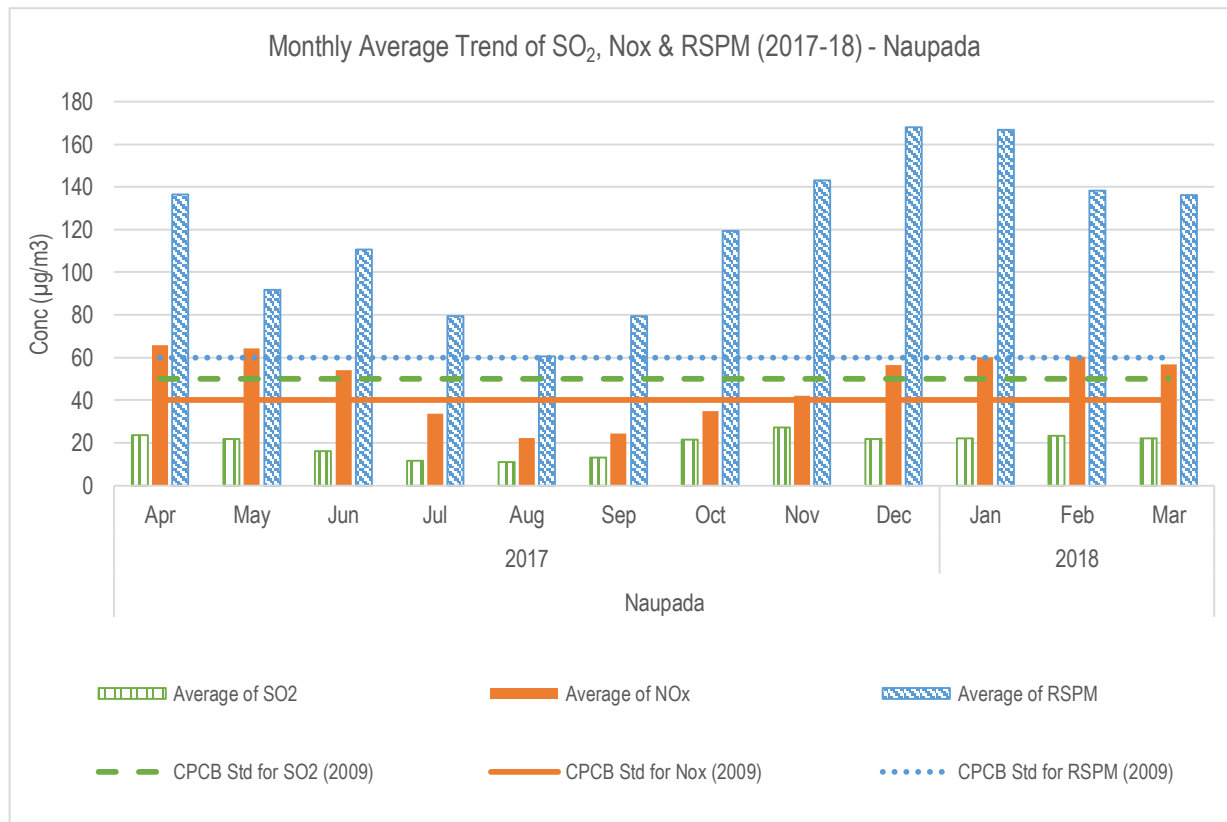


Figure No. 165: Monthly average reading recorded at Naupada

Table No. 168: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Naupada

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		50	40	60
Naupada	04-05	8	11	46
	05-06	6	10	51
	06-07	12	9	52
	07-08	11	10	50
	08-09	11	15	60
	09-10	14	21	55
	10-11	14	13	48
	11-12	13	10	56
	12-13	21	16	93
	13-14	17	43	113
	14-15	21	62	104
	15-16	28	63	102
	16-17	19	61	108
	17-18	19	48	119

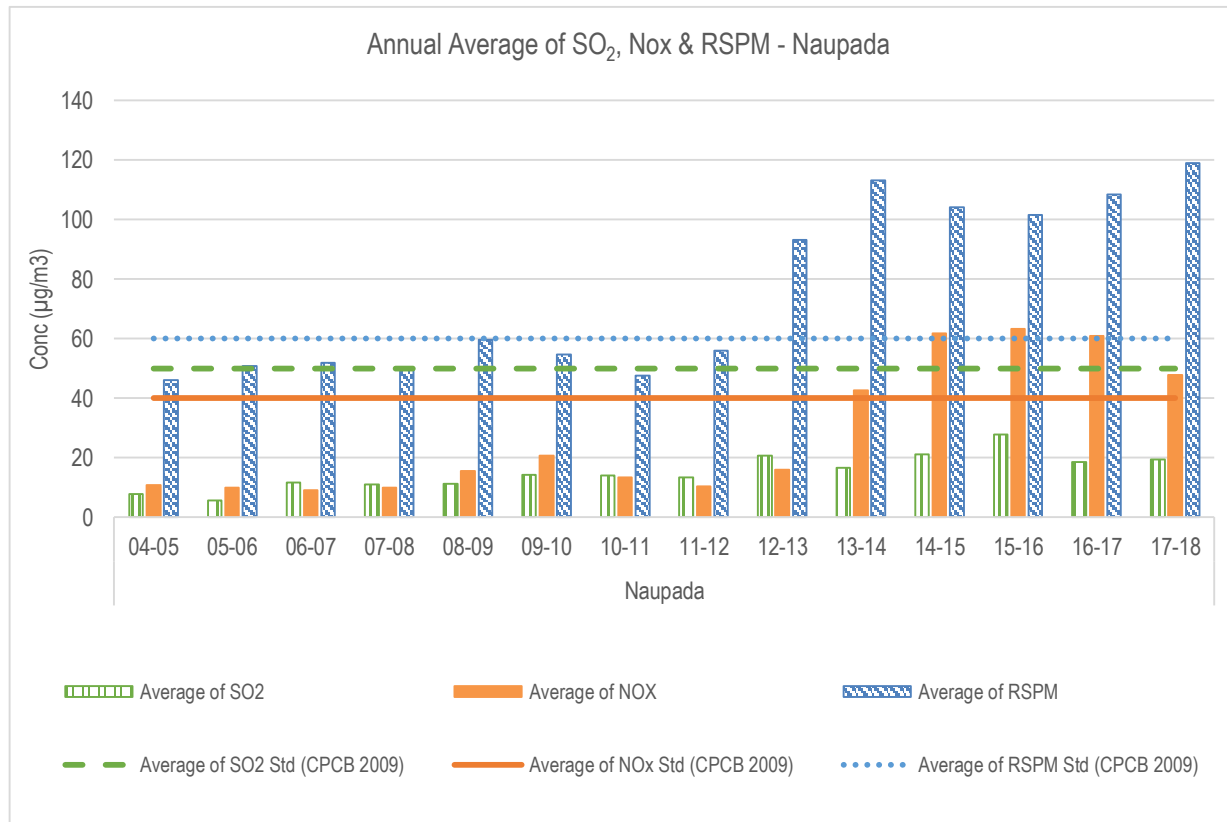


Figure No. 166: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Naupada



### Thane - Balkum Glaxo

Table No. 169: Data for Monthly average reading recorded at Balkum Glaxo

Station Name	year	Month	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
			50	40	60
Balkum/Glaxo	2017	Apr	20	55	163
		May	20	52	118
		Jun	13	49	134
		Jul	10	31	126
		Aug	9	18	66
		Sep	10	20	71
		Oct	14	24	106
		Nov	20	33	162
		Dec	16	41	154
	2018	Jan	19	37	183
		Feb	14	34	180
		Mar	13	31	166

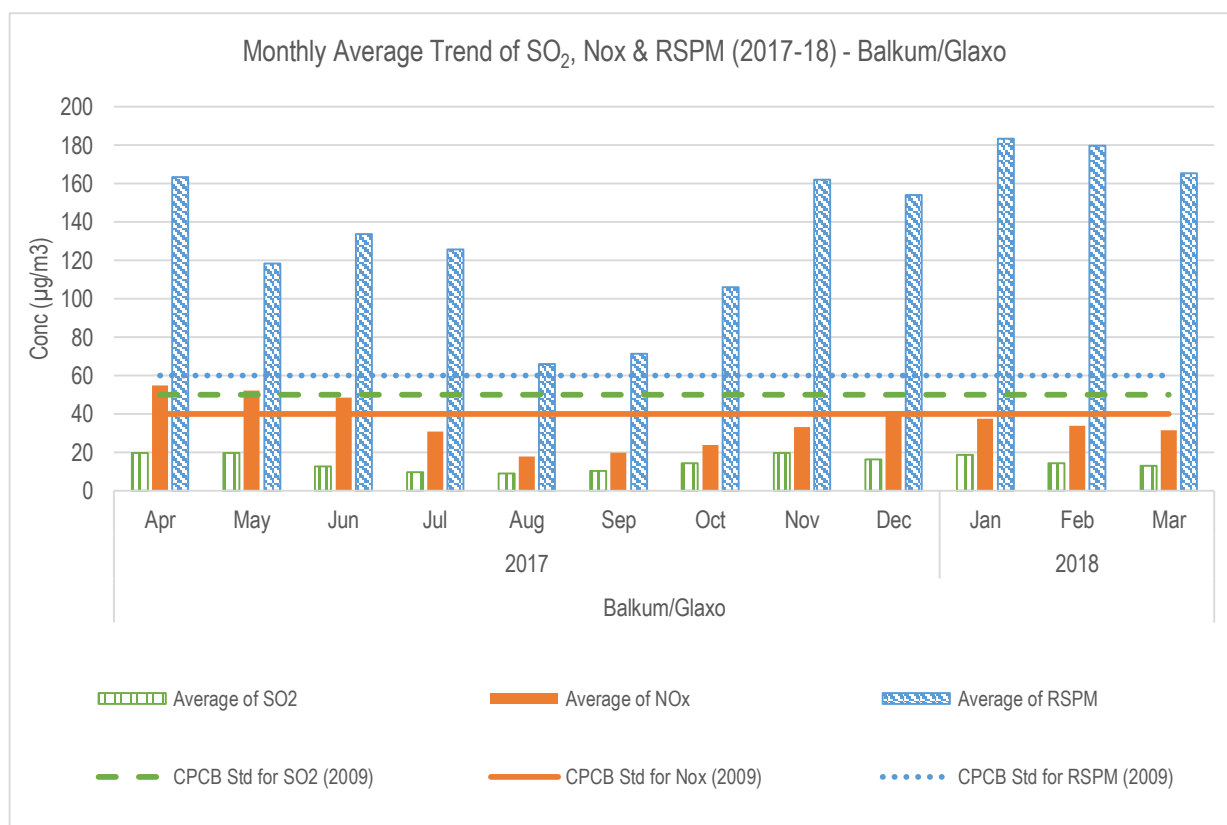


Figure No. 167: Monthly average reading recorded at Balkum Glaxo

Table No. 170: Data for Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Balkum Glaxo

Station Name	year	Average of SO <sub>2</sub>	Average of NO <sub>x</sub>	Average of RSPM
		<b>50</b>	<b>40</b>	<b>60</b>
Balkum/Glaxo	13-14	15	34	107
	14-15	20	60	131
	15-16	24	58	132
	16-17	15	52	122
	17-18	15	35	136

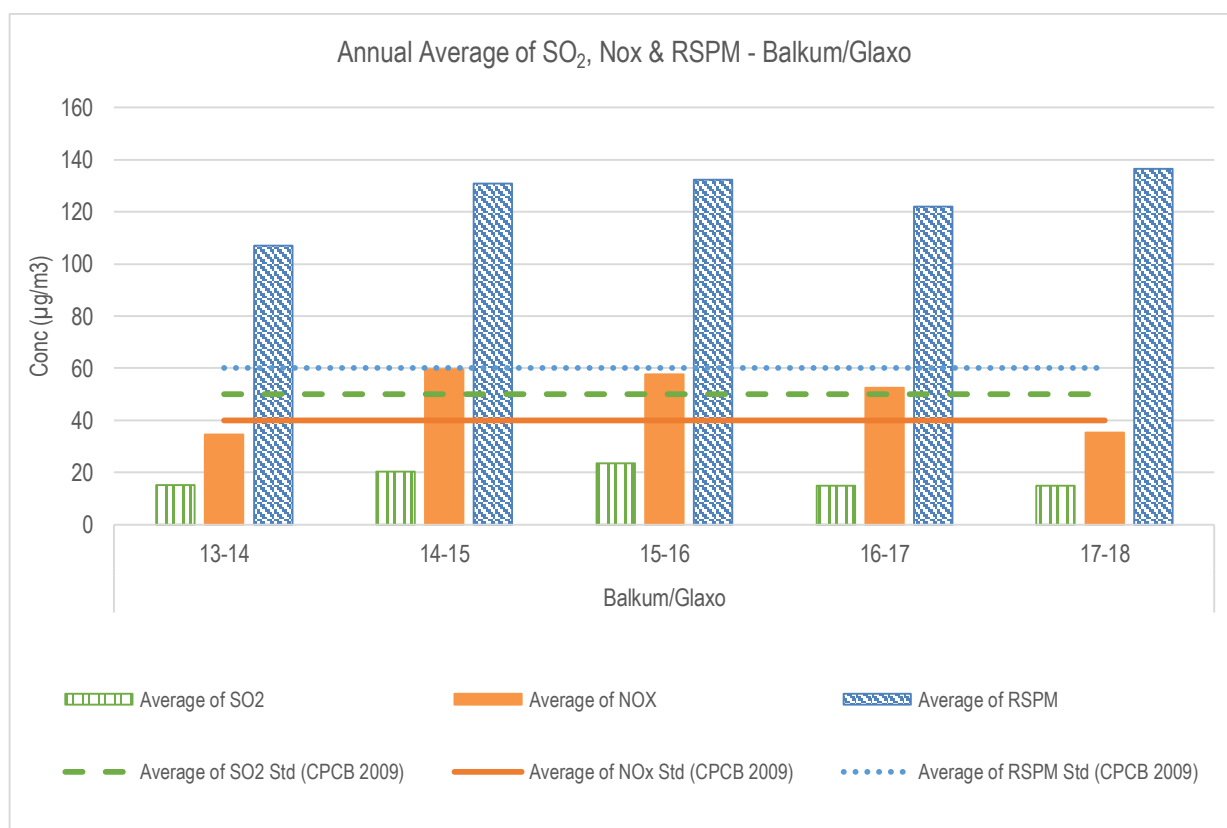
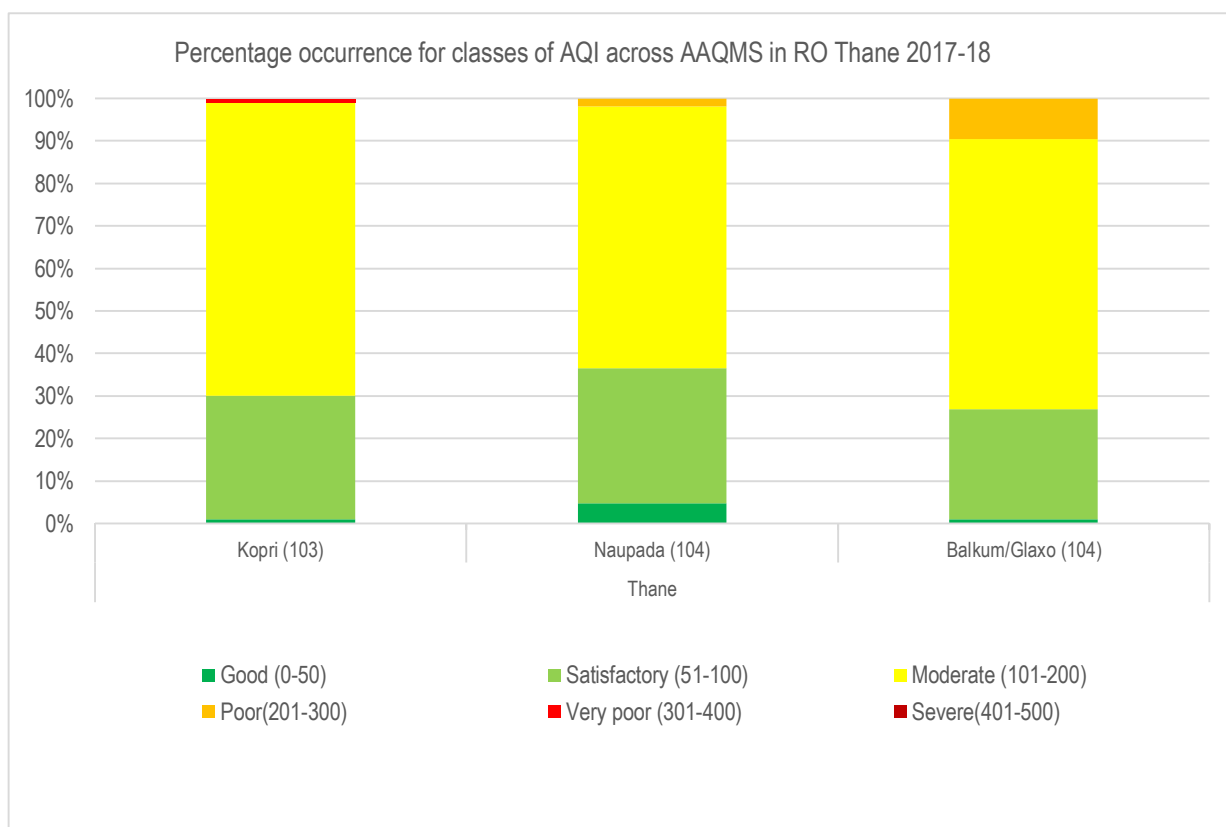


Figure No. 168: Annual average trend of SO<sub>2</sub>, NO<sub>x</sub>, and RSPM at Balkum Glaxo

**Table No. 171: Percentage exceedance of pollutants at Thane RO**

Station Name	Total Observations	Number of Observations (Exceedance)			% Exceedance		
		So <sub>2</sub>	Nox	RSPM	So <sub>2</sub>	Nox	RSPM
<b>Kopri</b>	103	0	0	72	0	0	70
<b>Naupada</b>	104	0	0	66	0	0	63
<b>Balkum/Glaxo</b>	104	0	0	76	0	0	73





## Annex -1 : List of Active AAQMS in Maharashtra (2017-18)

MPCB RO	Region	Station code	Station name	Type	Program
Amravati	Akola	700	LRT Commerce College	Residential	NAMP
	Akola	701	MIDC Water Works - Akola	Industrial	NAMP
	Akola	702	Akola- College of Engg & Technology	Commercial	NAMP
	Amravati	547	Raj Kamal Chowk	Rural and other areas	NAMP
	Amravati	548	Govt. College of Engineering	Residential	NAMP
	Amravati	549	Godhadiwala Private Limited	Industrial	NAMP
Aurangabad	Aurangabad	511	SBES College	Residential	NAMP
	Aurangabad	512	Collector Office, Aurangabad	Residential	NAMP
	Aurangabad	513	C.A.D.A. Office	Residential	NAMP
	Aurangabad		Aurangabad CAAQMS	Industrial	CAAQMS
	Jalna	706	Jalna- Bachat Bhavan	Residential	NAMP
	Jalna	707	Jalna- Krishnadhan seeds Ltd	Industrial	NAMP
	Latur	641	MIDC Water Works - Latur	Industrial	NAMP
	Latur	642	Shyam Nagar-Kshewraj Vidyalyaya	Residential	NAMP
	Latur	643	Ganj Golai - Sidhshwar Bank	Rural and other areas	NAMP
	Nanded	703	Ganeshnagar	Residential	NAMP
	Nanded	704	Mutha Chowk	Commercial	NAMP
Nanded	705	Industrial Area CIDCO	Industrial	NAMP	
Chandrapur	Chandrapur	267	Ghuggus	Residential	NAMP
	Chandrapur	281	Chandrapur - MIDC	Industrial	NAMP
	Chandrapur	396	Chandrapur - SRO MPCB	Residential	NAMP
	Chandrapur	638	Tadali MIDC	Industrial	NAMP
	Chandrapur	639	Ballarshah	Residential	NAMP
	Chandrapur	640	Rajura	Industrial	NAMP
	Chandrapur		Chandrapur CAAQMS	Industrial	CAAQMS
	Chandrapur		Civil lines, Chandrapur	Commercial	CAAQMS
Kalyan	Ambarnath	445	Ambarnath	Rural and other areas	NAMP

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

MPCB RO	Region	Station code	Station name	Type	Program
	Badlapur	649	Badlapur - BIWA House	Rural and other areas	NAMP
	Bhiwandi	823	I.G.M. Hospital	Rural and other areas	NAMP
	Bhiwandi	822	Prematai hall	Rural and other areas	NAMP
	Dombivali	265	Dombivali	Industrial	NAMP
	Dombivali	-	MIDC Office Dombivali	Rural and other areas	SAMP
	Dombivali		Dombivali CAAQMS	Industrial	CAAQMS
	Kalyan	824	MPCB RO Kalyan office	Rural and other areas	NAMP
	Ulhasnagar	647	Smt. CHM College Campus	Rural and other areas	NAMP
	Ulhasnagar	648	Powai Chowk	Rural and other areas	NAMP
Kolhapur	Kolhapur	508	Shivaji University Campus	Residential	NAMP
	Kolhapur	509	Ruikar Trust	Rural and other areas	NAMP
	Kolhapur	510	Mahadwar Road	Residential	NAMP
	Sangli	574	Terrace of SRO-Sangli, Udyog Bhavan	Residential	NAMP
	Sangli	575	Sangli-Miraj Primary Municipal school	Rural and other areas	NAMP
	Sangli	576	Krishna Valley school	Industrial	NAMP
Mumbai	Mumbai	-	Bandra	Residential	CAAQMS
	Mumbai	441	Sion	Residential	NAMP
Nagpur	Nagpur	287	IOE North Ambazari road	Residential	NAMP
	Nagpur	288	MIDC Office, Hingna Road	Industrial	NAMP
	Nagpur	314	Govt Polytechnic Col, Sadar	Rural and other areas	NAMP
	Nagpur	711	Civil lines Nagpur	Residential	NAMP
	Nagpur		Nagpur CAAQMS	Commercial	CAAQMS
Nashik	Jalgaon	644	Old B. J. Market	Residential	NAMP
	Jalgaon	645	Girna Water Tank	Residential	NAMP
	Jalgaon	646	MIDC Jalgaon	Industrial	NAMP
	Nashik	259	RTO Colony	Residential	NAMP
	Nashik	269	MIDC Satpur - VIP	Industrial	NAMP
	Nashik	280	NMC Nashik	Residential	NAMP
	Nashik	710	SRO Office Nashik	Residential	NAMP

Air Quality Status of Maharashtra 2017-18

MPCB RO	Region	Station code	Station name	Type	Program
	Nashik		Nashik CAAQMS	Commercial	CAAQMS
Navi Mumbai	Navi Mumbai	491	Rabale	Industrial	NAMP
	Navi Mumbai	492	Nerul - DY Patil	Residential	NAMP
	Navi Mumbai	493	Mahape, MPCB-Nirmal Bhavan	Industrial	NAMP
	Navi Mumbai	-	Airoli	Rural and other areas	CAAQMS
	Taloja	494	Kharghar - CIDCO Nodal Office	Residential	NAMP
	Taloja	496	Taloja - MIDC Building	Industrial	NAMP
Pune	Pune	312	Bhosari	Industrial	NAMP
	Pune	379	Nal Stop	Rural and other areas	NAMP
	Pune	381	Swargate, Pune	Residential	NAMP
	Pune	708	Pimpri-Chinchwad - BOB Building	Residential	NAMP
	Pune	-	Karve Road - CAAQMS	Residential	CAAQMS
	Solapur	299	WIT Campus	Residential	NAMP
	Solapur	300	Saat Rasta- Chithale Clinic	Residential	NAMP
	Solapur		Solapur	Residential	CAAQMS
Raigad	Panvel	495	Panvel- Water Supply Plant	Residential	NAMP
Thane	Thane	303	Kopri	Residential	NAMP
	Thane	304	Naupada	Rural and other areas	NAMP
	Thane	305	Balkum/Glaxo	Industrial	NAMP

## Annex -2: Parametric values of pollutants recorded by AAQMS 2017-18

### Sulphur Dioxide

MPCB RO	Station Name_final	Region	Total no.of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m <sup>3</sup> )	98 Percentile value for 24 hour concentration (µg/m <sup>3</sup> )	Annual Average concentration (µg/m <sup>3</sup> )	Min recorder 24hour concentration (µg/m <sup>3</sup> )
Amravati	LRT Commerce College	Akola	100	12	12	9	6
	MIDC Water Works - Akola	Akola	102	13	13	11	7
	Akola- College of Engg & Technology	Akola	102	12	11	9	6
	Raj Kamal Chowk	Amravati	97	18.0	17.0	12.6	6.0
	Govt. College of Engineering	Amravati	99	15.0	15.0	11.2	4.0
	Godhadiwala Private Limited	Amravati	91	16.0	15.2	11.1	4.0
Aurangabad	SBES College	Aurangabad	88	26.0	24.3	11.0	5.0
	Collector Office, Aurangabad	Aurangabad	104	18.0	16.0	9.3	5.0
	C.A.D.A. Office	Aurangabad	83	21	18	10	5
	Aurangabad CAAQMS	Aurangabad	365	7	7	5	2
	Jalna- Bachat Bhavan	Jalna	90	14	13	9	6
	Jalna- Krishnadhan seeds Ltd	Jalna	97	14	13	10	6
	MIDC Water Works - Latur	Latur	98	8	7	5	3
	Shyam Nagar-Kshewraj Vidyalaya	Latur	91	7	7	6	4
Aurangabad	Ganj Golai - Sidheshwar Bank	Latur	93	8	7	6	4
	Ganeshnagar	Nanded	64	29	29	22	12
	Mutha Chowk	Nanded	62	41	41	35	20
	Industrial Area CIDCO	Nanded	61	89	88	58	31



MPCB RO	Station Name_final	Region	Total no.of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m³)	98 Percentile value for 24 hour concentration (µg/m³)	Annual Average concentration (µg/m³)	Min recorder 24hour concentration (µg/m³)
Chandrapur	Ghuggus	Chandrapur	94	9	5	4	1
	Chandrapur - MIDC	Chandrapur	98	8	6	4	1
	Chandrapur - SRO MPCB	Chandrapur	279	6	5	4	4
	Tadali MIDC	Chandrapur	98	9	5	4	1
	Ballarshah	Chandrapur	90	5	5	4	2
	Rajura	Chandrapur	99	5	5	4	3
	Chandrapur CAAQMS	Chandrapur	351	56.5	36.0	7.6	0.3
Civil Lines , Chandrapur	Chandrapur	365	28	15	10	7	
Kalyan	Ambernath	Ambernath	70	47	46	25	13
	Badlapur - BIWA House	Badlapur	65	318	69	30	13
	I.G.M. Hospital	Bhiwandi	94	54	37	32	22
	Prematai hall	Bhiwandi	85	54	42	33	24
Kalyan	Dombivali	Dombivali	74	68.0	53.0	26.8	14.0
	MIDC Office Dombivali	Dombivali	82	51	46	25	7
	Dombivali CAAQMS	Dombivali	355	124.3	28.1	21.4	0.1
	MPCB RO Kalyan office	Kalyan	103	69	52	30	22
	Smt. CHM College Campus	Ulhasnagar	67	50	44	22	13
	Powai Chowk	Ulhasnagar	59	78	68	30	14
Kolhapur	Shivaji University Campus	Kolhapur	95	19	17	12	6
	Ruikar Trust	Kolhapur	88	42	40	28	15
	Mahadwar Road	Kolhapur	108	34	32	21	12
	Terrace of SRO-Sangli, Udyog Bhavan	Sangli	99	23	15	9	5
	Sangli-Miraj Primary Municipal school	Sangli	97	44	27	11	7

MPCB RO	Station Name_final	Region	Total no.of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m <sup>3</sup> )	98 Percentile value for 24 hour concentration (µg/m <sup>3</sup> )	Annual Average concentration (µg/m <sup>3</sup> )	Min recorder 24hour concentration (µg/m <sup>3</sup> )
	Krishna Valley school	Sangli	94	18	18	10	7
Mumbai	Bandra	Mumbai	326	39	33	14	4
	Sion	Mumbai	218	66.0	16.0	6.7	1.0
Nagpur	IOE North Ambazari road	Nagpur	98	18.0	15.0	10.5	7.0
Nagpur	MIDC Office, Hingna Road	Nagpur	105	16.0	15.0	10.7	7.0
	Govt Polytechnic Col, Sadar	Nagpur	104	18	18	10	7
	Civil lines Nagpur	Nagpur	284	82.0	14.0	9.8	6.0
	Nagpur CAAQMS	Nagpur	360	39.5	24.8	9.5	0.2
Nashik	Old B. J. Market	Jalgaon	102	17.0	15.0	12.4	10.0
	Girna Water Tank	Jalgaon	101	16.0	15.0	12.0	9.0
	MIDC Jalgaon	Jalgaon	105	17.0	16.0	13.1	11.0
	RTO Colony	Nashik	87	28	23	11	2
	MIDC Satpur - VIP	Nashik	90	21	21	11	2
	NMC Nashik	Nashik	102	24	23	11	2
	SRO Office Nashik	Nashik	248	26.0	24.0	11.1	2.0
	Nashik CAAQMS	Nashik	364	21	15	5	1
Navi Mumbai	Rabale	Navi Mumbai	91	36	31	23	16
	Nerul - DY Patil	Navi Mumbai	92	34	30	21	14
	Mahape, MPCB-Nirmal Bhavan	Navi Mumbai	111	61	53	24	16
	Airoli	Navi Mumbai	285	71	53	28	7
Navi Mumbai	Kharghar - CIDCO Nodal Office	Taloja	96	32	29	22	14
	Taloja - MIDC Building	Taloja	95	34	31	23	14
Pune	Bhosari	Pune	93	55	46	23	9
	Nal Stop	Pune	81	38	34	20	10

MPCB RO	Station Name_final	Region	Total no.of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration ( $\mu\text{g}/\text{m}^3$ )	98 Percentile value for 24 hour concentration ( $\mu\text{g}/\text{m}^3$ )	Annual Average concentration ( $\mu\text{g}/\text{m}^3$ )	Min recorder 24hour concentration ( $\mu\text{g}/\text{m}^3$ )
	Swargate, Pune	Pune	95	41	37	21	8
	Pimpri-Chinchwad - BOB Building	Pune	268	72	46	23	6
	Karve Road - CAAQMS	Pune	325	525	37	24	4
	WIT Campus	Solapur	86	18	17	14	11
	Saat Rasta- Chithale Clinic	Solapur	94	19	18	14	9
	Solapur	Solapur	313	60	29	19	9
Raigad	Panvel- Water Supply Plant	Panvel	100	58	30	22	16
Thane	Kopri	Thane	96	34	29	19	8
	Naupada	Thane	96	33	27	19	7
	Balkum/Glaxo	Thane	98	26	25	15	7

## Oxides of Nitrogen

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration ( µg/m3)	98 Percentile value for 24 hour concentration ( µg/m3)	Annual Average concentration ( µg/m3 )	Min recorder 24hour concentration ( µg/m3)
Amravati	LRT Commerce College	Akola	100	12	12	10	9
	MIDC Water Works - Akola	Akola	102	14	13	11	9
	Akola- College of Engg & Technology	Akola	102	12	11	10	8
	Raj Kamal Chowk	Amravati	97	124	121	20	7
	Govt. College of Engineering	Amravati	99	76.0	63.4	14.9	4.0
	Godhadiwala Private Limited	Amravati	91	118.0	108.4	18.8	4.0
Aurangabad	SBES College	Aurangabad	88	57	55	34	15
	Collector Office, Aurangabad	Aurangabad	104	45.0	44.0	30.8	10.0
	C.A.D.A. Office	Aurangabad	83	53	48	32	24
	Aurangabad CAAQMS	Aurangabad	365	64	55	36	18
	Jalna- Bachat Bhavan	Jalna	90	60	56	40	28
	Jalna- Krishnadhan seeds Ltd	Jalna	97	53	52	39	25
	MIDC Water Works - Latur	Latur	98	29	27	21	13
	Shyam Nagar-Kshewraj Vidyalaya	Latur	91	28	27	21	15
	Ganj Golai - Sidhleshwar Bank	Latur	93	27	27	21	15
	Ganeshnagar	Nanded	64	31	30	25	10
	Mutha Chowk	Nanded	62	34	34	31	18
	Industrial Area CIDCO	Nanded	61	90	89	62	37

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m3)	98 Percentile value for 24 hour concentration (µg/m3)	Annual Average concentration (µg/m3)	Min recorder 24hour concentration (µg/m3)
Chandrapur	Ghuggus	Chandrapur	94	37	36	26	5
	Chandrapur - MIDC	Chandrapur	98	46	42	29	9
	Chandrapur - SRO MPCB	Chandrapur	279	59	43	30	9
	Tadali MIDC	Chandrapur	98	53	42	27	5
	Ballarshah	Chandrapur	90	40	40	29	9
	Rajura	Chandrapur	99	43	39	27	8
	Chandrapur CAAQMS	Chandrapur	351	502.9	270.7	18.6	0.2
	Civil Lines , Chandrapur	Chandrapur	365	61	48	25	5
	Kalyan	Ambernath	Ambernath	70	106	104	69
Badlapur - BIWA House		Badlapur	65	191	152	72	22
I.G.M. Hospital		Bhiwandi	94	53	53	43	31
Prematai hall		Bhiwandi	85	50	48	43	32
Dombivali		Dombivali	74	150.0	141.7	71.8	36.0
MIDC Office Dombivali		Dombivali	82	158	114	68	36
Dombivali CAAQMS		Dombivali	355	180	82	66	7
MPCB RO Kalyan office		Kalyan	103	59	53	40	31
Smt. CHM College Campus		Ulhasnagar	67	92	84	63	40
Powai Chowk		Ulhasnagar	59	279	137	79	26
Kolhapur	Shivaji University Campus	Kolhapur	95	36	32	22	11
	Ruikar Trust	Kolhapur	88	81	77	49	21
	Mahadwar Road	Kolhapur	108	64	63	36	14
	Terrace of SRO-Sangli, Udyog Bhavan	Sangli	99	91	87	38	11
	Sangli-Miraj Primary	Sangli	97	149	139	51	12

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m <sup>3</sup> )	98 Percentile value for 24 hour concentration (µg/m <sup>3</sup> )	Annual Average concentration (µg/m <sup>3</sup> )	Min recorder 24hour concentration (µg/m <sup>3</sup> )
	Municipal school						
	Krishna Valley school	Sangli	94	92	82	43	14
Mumbai	Bandra	Mumbai	326	214	146	47	10
	Sion	Mumbai	218	246	155	78	29
Nagpur	IOE North Ambazari road	Nagpur	98	52.0	45.2	33.1	17.0
	MIDC Office, Hingna Road	Nagpur	105	50.0	47.9	33.6	20.0
	Govt Polytechnic Col, Sadar	Nagpur	104	87	70	34	19
	Civil lines Nagpur	Nagpur	284	47.0	42.3	30.0	14.0
	Nagpur CAAQMS	Nagpur	360	65.5	47.0	18.9	0.3
Nashik	Old B. J. Market	Jalgaon	102	85.0	41.0	29.8	23.0
	Girna Water Tank	Jalgaon	101	39.0	36.0	28.7	21.0
	MIDC Jalgaon	Jalgaon	105	38.0	37.9	31.0	25.0
	RTO Colony	Nashik	87	33	30	21	9
	MIDC Satpur - VIP	Nashik	90	32	30	20	9
	NMC Nashik	Nashik	102	31	30	21	5
	SRO Office Nashik	Nashik	248	73	30	21	4
	Nashik CAAQMS	Nashik	364	71	45	17	0.4
Navi Mumbai	Rabale	Navi Mumbai	91	68	61	46	25
	Nerul - DY Patil	Navi Mumbai	92	69	65	43	29
	Mahape, MPCB-Nirmal Bhavan	Navi Mumbai	111	70	66	47	21
	Airoli	Navi Mumbai	285	99	65	36	19
	Kharghar - CIDCO Nodal Office	Taloja	96	69	65	44	25

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m3)	98 Percentile value for 24 hour concentration (µg/m3)	Annual Average concentration (µg/m3)	Min recorder 24hour concentration (µg/m3)
	Taloja - MIDC Building	Taloja	95	71	65	47	33
Pune	Bhosari	Pune	93	177	111	58	12
	Nal Stop	Pune	81	147	118	63	19
	Swargate, Pune	Pune	95	173	156	75	20
	Pimpri-Chinchwad - BOB Building	Pune	268	198	142	60	12
	Karve Road - CAAQMS	Pune	325	112	80	47	10
	WIT Campus	Solapur	86	38	37	32	24
	Saat Rasta- Chithale Clinic	Solapur	94	147	128	42	24
	Solapur	Solapur	313	194	149	62	24
Raigad	Panvel- Water Supply Plant	Panvel	100	64	63	47	35
Thane	Kopri	Thane	96	71	68	47	5
	Naupada	Thane	96	74	69	48	13
	Balkum/Glaxo	Thane	98	59	58	37	12

**Particulate Matter (PM 10)**

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration (µg/m <sup>3</sup> )	98 Percentile value for 24 hour concentration (µg/m <sup>3</sup> )	Annual Average concentration (µg/m <sup>3</sup> )	Min recorder 24hour concentration (µg/m <sup>3</sup> )
Amravati	LRT Commerce College	Akola	100	144	142	110	62
	MIDC water works -Akola	Akola	102	149	146	119	81
	Akola- College of Engg & Technology	Akola	102	160	150	113	67
	Raj Kamal Chowk	Amravati	97	164	159	123	77
	Govt. College of Engineering	Amravati	99	113	98	68	21
	Godhadiwala Private Limited	Amravati	91	128	126	97	31
Aurangabad	SBES College	Aurangabad	88	200	174	84	32
	Collector Office, Aurangabad	Aurangabad	104	150	140	79	10
	C.A.D.A. Office	Aurangabad	83	158	131	80	26
	Aurangabad CAAQMS	Aurangabad	365	195	143	71	11
	Jalna- Bachat Bhavan	Jalna	90	160	145	111	63
	Jalna- Krishnadhan seeds Ltd	Jalna	97	117	108	86	53
	MIDC water works -Latur	Latur	98	175	152	82	25
	Shyam Nagar-Kshewraj Vidyalaya	Latur	91	278	169	85	16
	Ganj Golai - Sidhshwar Bank	Latur	93	373	183	81	20



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MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration ( µg/m3)	98 Percentile value for 24 hour concentration (µg/m3)	Annual Average concentration (µg/m3 )	Min recorder 24hour concentration (µg/m3)
	Ganeshnagar	Nanded	64	35	33	23	13
	Mutha Chowk	Nanded	62	49	49	39	21
	Industrial Area CIDCO	Nanded	61	71	71	63	53
Chandrapur	Ghuggus	Chandrapur	94	616	583	295	78
	Chandrapur MIDC	Chandrapur	98	181	133	74	29
	Chandrapur - SRO MPCB	Chandrapur	279	204	175	89	23
	Tadali MIDC	Chandrapur	98	275	236	108	27
	Ballarshah	Chandrapur	90	256	237	133	36
	Rajura	Chandrapur	99	387	348	187	57
	Chandrapur CAAQMS	Chandrapur	351	205	160	67	0.1
	Civil Lines , Chandrapur	Chandrapur	365	259	240	125	16
Kalyan	Ambernath	Ambernath	70	609	583	202	72
	Badlapur - BIWA House	Badlapur	65	810	687	196	51
	I.G.M. Hospital	Bhiwandi	94	83	82	69	61
	Prematai hall	Bhiwandi	85	81	80	66	61
	Dombivali	Dombivali	74	975	603	231	6
	MIDC Office Dombivali	Dombivali	82	675	649	181	42
	Dombivali CAAQMS	Dombivali	355	465	81	80	16.5
	MPCB RO Kalyan office	Kalyan	103	83	82	69	61
	Smt. CHM College	Ulhasnagar	67	392	283	136	38

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration ( µg/m3)	98 Percentile value for 24 hour concentration (µg/m3)	Annual Average concentration (µg/m3 )	Min recorder 24hour concentration (µg/m3)
	Campus						
	Powai Chowk	Ulhasnagar	59	653	613	224	57
Kolhapur	Shivaji University Campus	Kolhapur	95	88	83	59	29
Kolhapur	Ruikar Trust	Kolhapur	88	163	161	118	60
	Mahadwar Road	Kolhapur	108	136	133	91	38
	Terrace of SRO-Sangli, Udyog Bhavan	Sangli	99	246	199	85	17
	Sangli-Miraj Primary Municipal school	Sangli	97	185	178	82	24
	Krishna Valley school	Sangli	94	175	170	83	24
Mumbai	Bandra	Mumbai	326	360	238	107	11
	Sion	Mumbai	218	376	281	150	11.0
Nagpur	IOE North Ambazari road	Nagpur	98	154	148	94	51.0
	MIDC Office, Hingna Road	Nagpur	105	166	157	100	54.0
	Govt Polytechnic Col, Sadar	Nagpur	104	149	142	92	48
	Civil lines Nagpur	Nagpur	284	181	129	64	37.0
	Nagpur CAAQMS	Nagpur	360	246	138	71	15.8
Nashik	Old B. J. Market	Jalgaon	102	117	111	73	48.0
	Girna Water Tank	Jalgaon	101	115	101	71	42.0
	MIDC Jalgaon	Jalgaon	105	123	107	79	51.0
	RTO Colony	Nashik	87	202	170	88	29
	MIDC Satpur - VIP	Nashik	90	182	164	80	17

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MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration ( µg/m3)	98 Percentile value for 24 hour concentration (µg/m3)	Annual Average concentration (µg/m3 )	Min recorder 24hour concentration (µg/m3)
	NMC Nashik	Nashik	102	200	172	96	40
	SRO Office Nashik	Nashik	248	197	170	78	19
	Nashik CAAQMS	Nashik	364	145	98	63	8.9
Navi Mumbai	Rabale	Navi Mumbai	91	337	315	108	28
	Nerul - DY Patil	Navi Mumbai	92	603	337	119	27
	Mahape, MPCB-Nirmal Bhavan	Navi Mumbai	111	206	194	91	25
	Airoli	Navi Mumbai	285	185	160	60	4.0
	Kharghar - CIDCO Nodal Office	Taloja	96	220	196	90	27
	Taloja - MIDC Building	Taloja	95	241	206	107	28
Pune	Bhosari	Pune	93	310	289	111	9
	Nal Stop	Pune	81	316	233	101	24
	Swargate, Pune	Pune	95	220	180	91	17
	Pimpri-Chinchwad - BOB Building	Pune	268	378	218	88	6
	Karve Road - CAAQMS	Pune	325	198	152	72	15
	WIT Campus	Solapur	86	76	75	65	49
	Saat Rasta-Chithale Clinic	Solapur	94	204	177	78	53.0
	Solapur	Solapur	313	253	199	97	20
Raigad	Panvel- Water Supply Plant	Panvel	100	264	216	104	27.0
Thane	Kopri	Thane	96	311	196	120	47
	Naupada	Thane	96	203	195	119	21

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

MPCB RO	Station Name	Region	Total No of 24 hr observations recorded in 2017-18	Maximum recorded 24 hr concentration ( µg/m3)	98 Percentile value for 24 hour concentration (µg/m3)	Annual Average concentration (µg/m3 )	Min recorder 24hour concentration (µg/m3)
	Balkum/Glaxo	Thane	98	282	249	133	36

## Annex -3: Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> and RSPM across Maharashtra

Table No. 172: AQI for SO<sub>2</sub> of all AAQMS across Maharashtra

MPCB RO	Station Name	Total Observations	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor(201-300)	Very poor (301-400)	Severe(401-500)
Amravati	LRT Commerce College	104	104					
	MIDC Water Works - Akola	107	107					
	Akola- College of Engg & Technology	112	112					
	Raj Kamal Chowk	106	106					
	Govt. College of Engineering	106	106					
	Godhadiwala Private Limited	97	97					
Aurangabad	SBES College	94	94					
	Collector Office, Aurangabad	106	106					
	C.A.D.A. Office	89	89					
	Aurangabad CAAQMS	365	365					
	Jalna- Bachat Bhavan	98	98					
	Jalna- Krishnadhan seeds Ltd	104	104					
	MIDC Water Works - Latur	112	112					
	Shyam Nagar- Kshewraj Vidyalaya	101	101					
	Ganj Golai - Sidhshwar	103	103					

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

	Bank							
	Ganeshnagar	103	103					
	Mutha Chowk	103	100	3				
	Industrial Area CIDCO	106	55	46	5			
Chandrapur	Ghuggus	105	105					
	Chandrapur - MIDC	101	101					
	Chandrapur - SRO MPCB	304	304					
	Tadali MIDC	107	107					
	Ballarshah	101	101					
	Rajura	106	106					
	Chandrapur CAAQMS	351	345	6				
	Civil Lines , Chandrapur	365	365					
Kalyan	Ambernath	99	96	3				
	Badlapur - BIWA House	90	82	6			2	
	I.G.M. Hospital	101	101					
	Prematai hall	96	93	3				
	Dombivali	76	72	4				
	MIDC Office Dombivali	113	110	3				
	Dombivali CAAQMS	355	310	44	1			
	MPCB RO Kalyan office	110	105	5				
	Smt. CHM College Campus	98	94	4				
	Powai Chowk	83	69	14				
Kolhapur	Shivaji University Campus	104	104					
	Ruikar Trust	95	94	1				

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	Mahadwar Road	114	114					
	Terrace of SRO- Sangli, Udyog Bhavan	104	104					
	Sangli-Miraj Primary Municipal school	105	104	1				
	Krishna Valley school	104	104					
Mumbai	Bandra	347	347					
	Sion	226	225	1				
Nagpur	IOE North Ambazari road	107	107					
	MIDC Office, Hingna Road	113	113					
	Govt Polytechnic Col, Sadar	106	106					
	Civil lines Nagpur	309	308		1			
	Nagpur CAAQMS	360	360					
Nashik	Old B. J. Market	112	112					
	Girna Water Tank	109	109					
	MIDC Jalgaon	110	110					
	RTO Colony	103	103					
	MIDC Satpur - VIP	105	105					
	NMC Nashik	122	122					
	SRO Office Nashik	292	292					
	Nashik CAAQMS	364	364					
Navi Mumbai	Rabale	101	101					
	Nerul - DY Patil	104	104					
	Mahape, MPCB- Nirmal Bhavan	128	123	5				

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

	Airoli	300	253	47				
	Kharghar - CIDCO Nodal Office	104	104					
	Taloja - MIDC Building	104	104					
Pune	Bhosari	101	91	10				
	Nal Stop	82	80	2				
	Swargate, Pune	101	99	2				
	Pimpri-Chinchwad - BOB Building	285	269	16				
	Karve Road - CAAQMS	345	339	4	1			1
	WIT Campus	94	94					
	Saat Rasta-Chithale Clinic	104	104					
	Solapur	335	333	2				
Raigad	Panvel- Water Supply Plant	105	104	1				
Thane	Kopri	103	103					
	Naupada	104	104					
	Balkum/Glaxo	104	104					



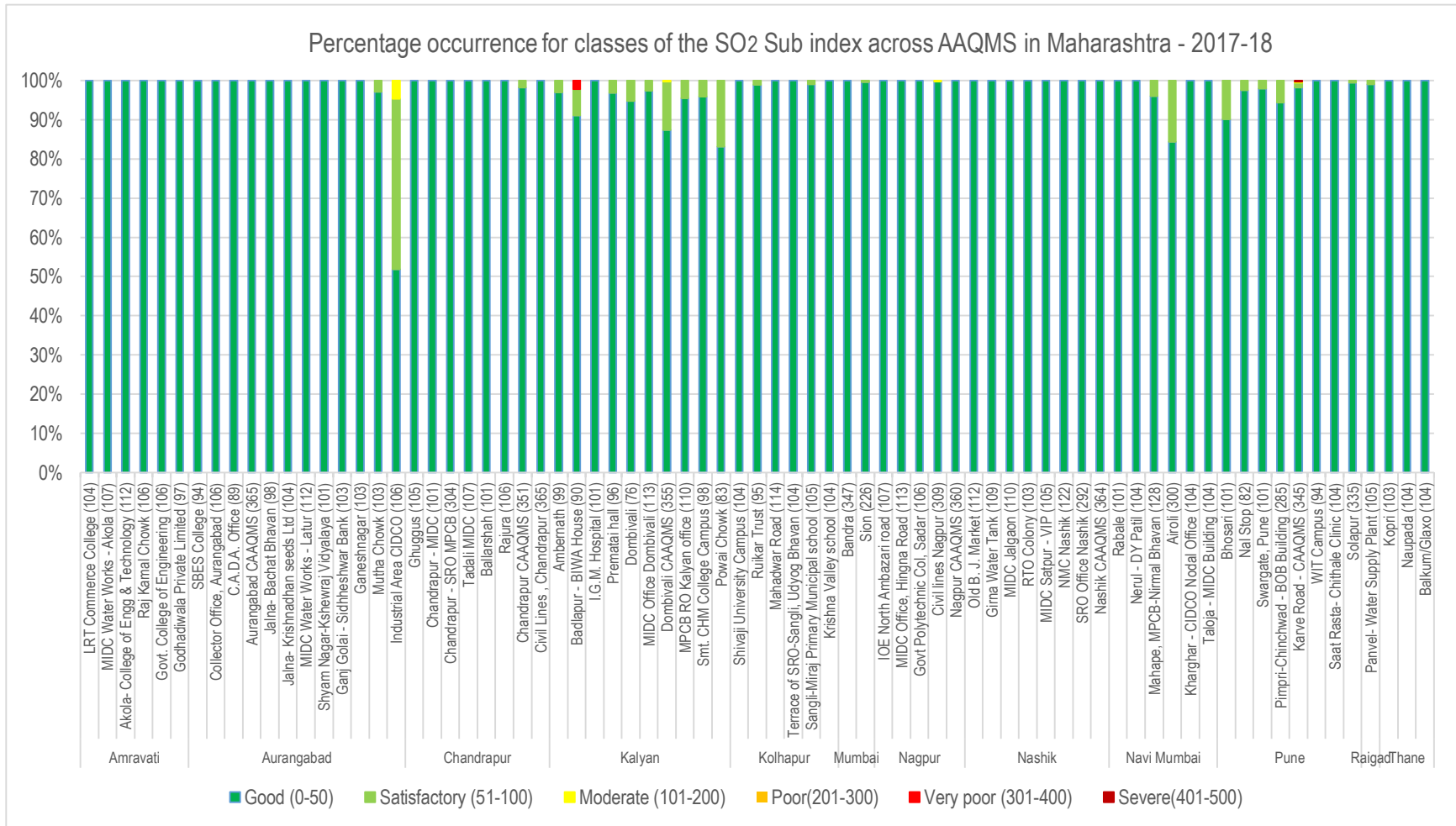


Figure No. 169:Percentage occurrence of SO<sub>2</sub> AQI of AAQMS across Maharashtra 2017-18

Table No. 173 : AQI for NO<sub>x</sub> of all AAQMS across Maharashtra

MPCB RO	Station Name	Total Observations	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor(201-300)	Very poor (301-400)	Severe(401-500)
Amravati	LRT Commerce College	104	104					
	MIDC Water Works - Akola	107	107					
	Akola- College of Engg & Technology	112	112					
	Raj Kamal Chowk	106	97		9			
	Govt. College of Engineering	106	98	8				
	Godhadiwala Private Limited	97	88	1	8			
Aurangabad	SBES College	94	87	7				
	Collector Office, Aurangabad	106	104	2				
	C.A.D.A. Office	89	87	2				
	Aurangabad CAAQMS	365	246	119				
	Jalna- Bachat Bhavan	98	59	39				
	Jalna- Krishnadhan seeds Ltd	104	60	44				
	MIDC Water Works - Latur	112	112					
	Shyam Nagar- Kshewraj Vidyalaya	101	101					
	Ganj Golai - Sidhshwar Bank	103	103					

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	Ganeshnagar	103	103					
	Mutha Chowk	103	95	8				
	Industrial Area CIDCO	106	32	66	8			
Chandrapur	Ghuggus	105	105					
	Chandrapur - MIDC	101	95	6				
	Chandrapur - SRO MPCB	304	294	10				
	Tadali MIDC	107	104	3				
	Ballarshah	101	101					
	Rajura	106	104	2				
	Chandrapur CAAQMS	351	351	341	1	1		1
	Civil Lines , Chandrapur	365	365	350	15			
Kalyan	Ambernath	99		72	27			
	Badlapur - BIWA House	90	2	66	22			
	I.G.M. Hospital	101	25	76				
	Prematai hall	96	9	87				
	Dombivali	76	2	46	28			
	MIDC Office Dombivali	113	5	66	42			
	Dombivali CAAQMS	355	84	151	116	4		
	MPCB RO Kalyan office	110	54	56				
	Smt. CHM College Campus	98	2	87	9			
	Powai Chowk	83		53	29			1
Kolhapur	Shivaji University Campus	104	104					

Annex -3 : Occurrence of AQI categories for SO<sub>2</sub>, NO<sub>x</sub> AND rspm across Maharashtra

	Ruikar Trust	95	33	61	1			
	Mahadwar Road	114	80	34				
	Terrace of SRO- Sangli, Udyog Bhavan	104	71	31	2			
	Sangli-Miraj Primary Municipal school	105	53	35	17			
	Krishna Valley school	104	63	39	2			
Mumbai	Bandra	347	199	95	50	3		
	Sion	226	15	123	84	3		1
Nagpur	IOE North Ambazari road	107	80	27				
	MIDC Office, Hingna Road	113	75	38				
	Govt Polytechnic Col, Sadar	106	85	21				
	Civil lines Nagpur	309	282	27				
	Nagpur CAAQMS	360	342	18				
Nashik	Old B. J. Market	112	109	2	1			
	Girna Water Tank	109	109					
	MIDC Jalgaon	110	110					
	RTO Colony	103	103					
	MIDC Satpur - VIP	105	105					
	NMC Nashik	122	122					
	SRO Office Nashik	292	290	2				
	Nashik CAAQMS	364	352	12				
Navi Mumbai	Rabale	101	31	70				
	Nerul - DY Patil	104	42	62				

Air Quality Status of Maharashtra 2017-18

	Mahape, MPCB-Nirmal Bhavan	128	54	74				
	Airoli	300	233	66	1			
	Kharghar - CIDCO Nodal Office	104	45	59				
	Taloja - MIDC Building	104	29	75				
Pune	Bhosari	101	35	44	22			
	Nal Stop	82	12	57	13			
	Swargate, Pune	101	16	48	36	1		
	Pimpri-Chinchwad - BOB Building	285	103	122	59	1		
	Karve Road - CAAQMS	345	96	248	1			
	WIT Campus	94	94					
	Saat Rasta-Chithale Clinic	104	87	10	7			
	Solapur	335	116	114	99	6		
Raigad	Panvel- Water Supply Plant	105	29	76				
Thane	Kopri	103	33	70				
	Naupada	104	34	70				
	Balkum/Glaxo	104	65	39				



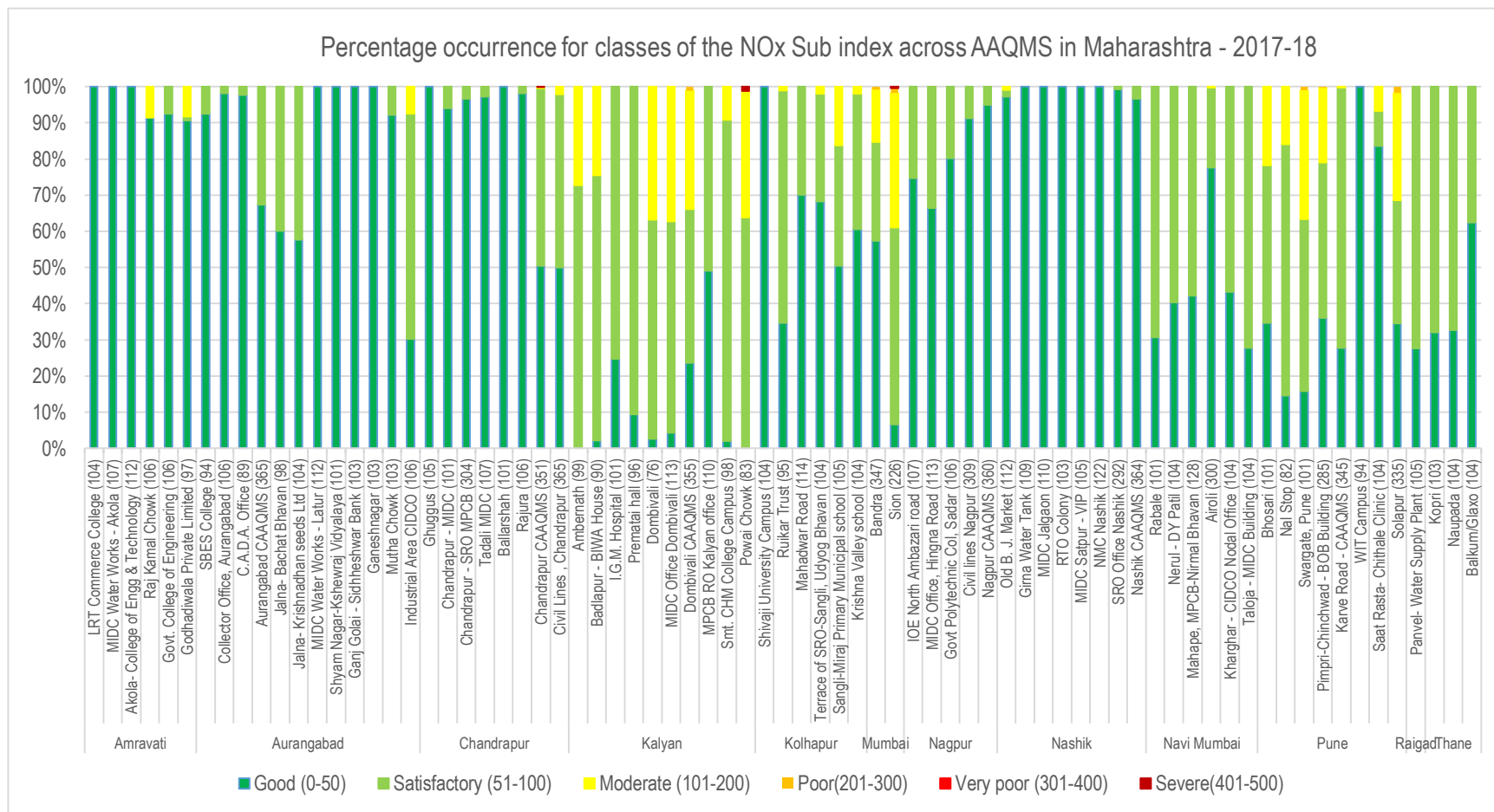


Figure No. 170: Percentage occurrence of NOx for AAQMS across Maharashtra 2017-18

**Table No. 174: AQI for RSPM of all AAQMS across Maharashtra**

MPCB RO	Station Name	Total Observations	Good (0-50)	Satisfactory (51-100)	Moderate (101-200)	Poor(201-300)	Very poor (301-400)	Severe(401-500)
Amravati	LRT Commerce College	104		35	69			
	MIDC Water Works - Akola	107		40	67			
	Akola- College of Engg & Technology	112		47	65			
	Raj Kamal Chowk	106		15	91			
	Govt. College of Engineering	106	15	89	2			
	Godhadiwala Private Limited	97	3	44	50			
Aurangabad	SBES College	94	12	72	10			
	Collector Office, Aurangabad	106	16	87	3			
	C.A.D.A. Office	89	18	68	3			
	Aurangabad CAAQMS	365	108	208	49			
	Jalna- Bachat Bhavan	98		24	74			
	Jalna- Krishnadhan seeds Ltd	104		95	9			
	MIDC Water Works - Latur	112	19	60	33			
	Shyam Nagar-Kshewraj	101	13	59	28	1		



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	Vidyalaya							
	Ganj Golai - Sidhshwar Bank	103	26	54	23			
	Ganeshnagar	103	77	26				
	Mutha Chowk	103	103					
	Industrial Area CIDCO	106		106				
Chandrapur	Ghuggus	105		5	24	26	26	24
	Chandrapur - MIDC	101	20	67	14			
	Chandrapur - SRO MPCB	304	43	149	111	1		
	Tadali MIDC	107	12	42	44	9		
	Ballarshah	101	3	19	70	9		
	Rajura	106		9	67	25	5	
	Chandrapur CAAQMS	351	131	184	35	1		
	Civil Lines , Chandrapur	365	51	85	189	40		
Kalyan	Ambernath	99		3	51	15	8	22
	Badlapur - BIWA House	90		3	47	16	12	12
	I.G.M. Hospital	101		101				
	Prematai hall	96		96				
	Dombivali	76	4	7	30	10	8	17
	MIDC Office Dombivali	113	3	17	50	17	12	14



	Dombivali CAAQMS	355	137	191	17	7	1	2
	MPCB RO Kalyan office	110		110				
	Smt. CHM College Campus	98	4	21	62	7	2	2
	Powai Chowk	83		3	44	13	9	14
Kolhapur	Shivaji University Campus	104	28	76				
	Ruikar Trust	95		23	72			
	Mahadwar Road	114	2	73	39			
	Terrace of SRO- Sangli, Udyog Bhavan	104	43	24	34	3		
	Sangli-Miraj Primary Municipal school	105	45	20	40			
	Krishna Valley school	104	33	41	29	1		
Mumbai	Bandra	347	65	131	124	25	2	
	Sion	226	2	59	123	39	3	
Nagpur	IOE North Ambazari road	107		72	35			
	MIDC Office, Hingna Road	113		63	50			
	Govt Polytechnic Col, Sadar	106	1	66	39			
	Civil lines Nagpur	309	91	203	15			

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	Nagpur CAAQMS	360	74	270	14	2		
Nashik	Old B. J. Market	112	4	102	6			
	Girna Water Tank	109	3	101	5			
	MIDC Jalgaon	110		102	8			
	RTO Colony	103	10	56	35	2		
	MIDC Satpur - VIP	105	26	47	32			
	NMC Nashik	122	14	47	61			
	SRO Office Nashik	292	90	112	90			
	Nashik CAAQMS	364	126	231	7			
Navi Mumbai	Rabale	101	15	46	28	8	4	
	Nerul - DY Patil	104	9	43	44	5	2	1
	Mahape, MPCB-Nirmal Bhavan	128	22	60	45	1		
	Airoli	300	129	102	69			
	Kharghar - CIDCO Nodal Office	104	19	44	40	1		
	Taloja - MIDC Building	104	10	39	52	3		
Pune	Bhosari	101	26	24	39	11	1	
	Nal Stop	82	13	27	40	1	1	
	Swargate, Pune	101	25	39	36	1		



	Pimpri- Chinchwad - BOB Building	285	102	72	100	9	2	
	Karve Road - CAAQMS	345	126	141	78			
	WIT Campus	94	3	91				
	Saat Rasta- Chithale Clinic	104		94	9	1		
	Solapur	335	82	100	148	5		
Raigad	Panvel- Water Supply Plant	105	14	41	47	3		
Thane	Kopri	103	1	30	71		1	
	Naupada	104	5	33	64	2		
	Balkum/Glaxo	104	1	27	66	10		

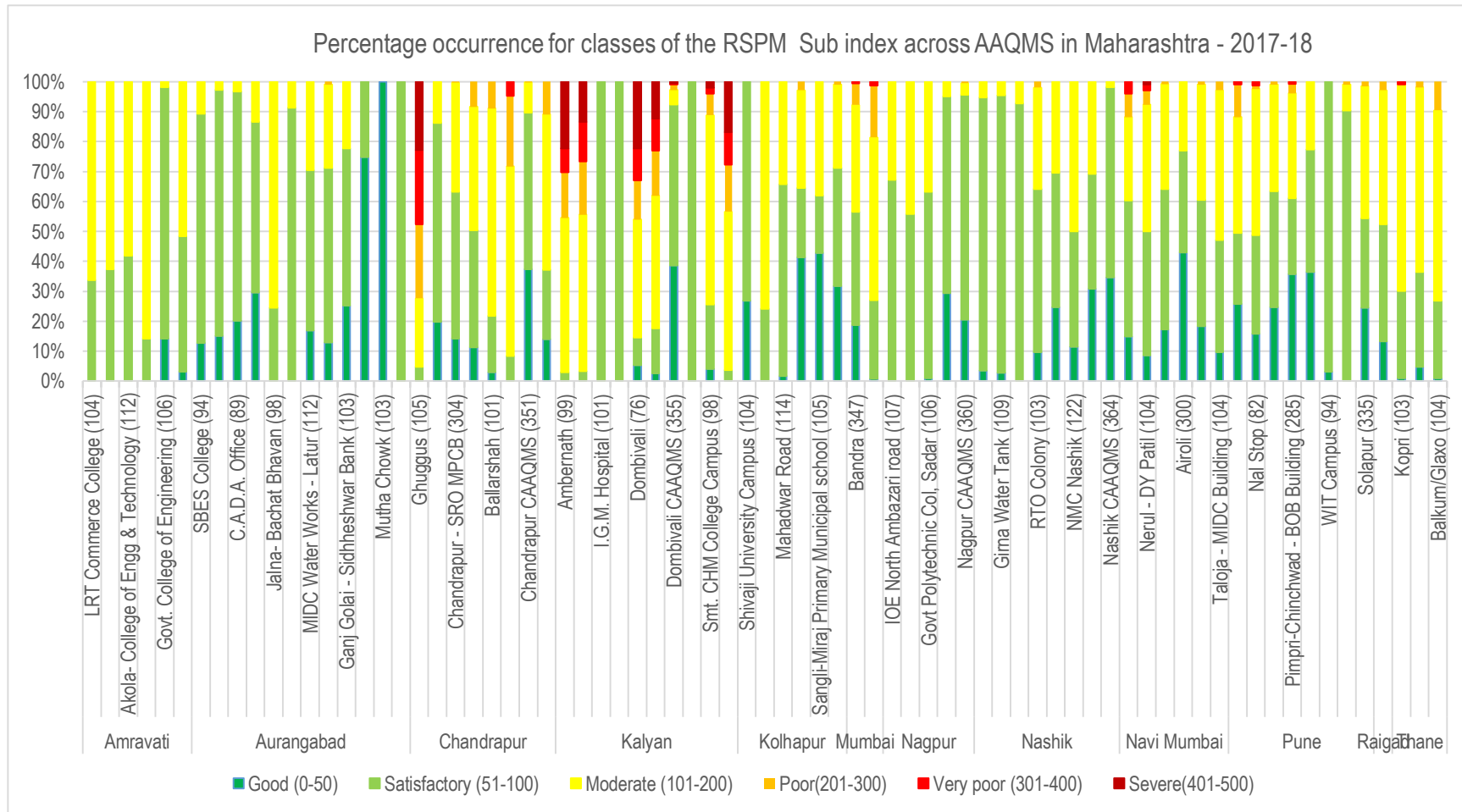


Figure No. 171: Percentage occurrence of RSPM AQI of AAQMS across Maharashtra 2017-18

# Appendix –A: Revised NAAQS 2009

रजिस्ट्री सं-डी.एल-33004/99

REGD. NO. D. L.-33004/99

## भारत का राजपत्र The Gazette of India

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राष्ट्रीय परिवेशी वायु गुणवत्ता मानक  
केन्द्रीय प्रदूषण नियंत्रण बोर्ड  
अधिसूचना  
नई दिल्ली, 18 नवम्बर, 2009

सं. सी-29016/20/90/पी.सी.आई.-1.—वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 (1981 का 14) की धारा 16 की उपधारा (2) (एच) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए तथा अधिसूचना संख्या का.आ. 384(ई), दिनांक 11 अप्रैल, 1994 और का.आ. 935 (ई) दिनांक 14 अक्टूबर, 1998 के अधिक्रमण में केन्द्रीय प्रदूषण नियंत्रण बोर्ड इसके द्वारा तत्काल प्रभाव से राष्ट्रीय परिवेशी वायु गुणवत्ता मानक अधिसूचित करता है, जो इस प्रकार है-

राष्ट्रीय परिवेशी वायु गुणवत्ता मानक

क्र. सं.	प्रदूषक	समय आधारित औसत	परिवेशी वायु में सान्द्रण		
			औद्योगिक, शहरी, ग्रामीण और अन्य क्षेत्र	पारिस्थितिकीय संवेदनशील क्षेत्र (केन्द्र सरकार द्वारा अधिसूचित)	प्रबोधन की पद्धति
(1)	(2)	(3)	(4)	(5)	(6)
1	सल्फर डाई आक्साइड (SO <sub>2</sub> ), µg/m <sup>3</sup>	वार्षिक* 24 घंटे**	50 80	20 80	-उन्नत वेस्ट और गार्डक -परवहन परिधीयता
2	नाइट्रोजन डाई आक्साइड (NO <sub>2</sub> ), µg/m <sup>3</sup>	वार्षिक* 24 घंटे**	40 80	30 80	-उपांतरित जैकब और हॉवाइजर (सोडियम-आर्सेनाइट) -संसाधनिक संदीप्ति
3	विश्वित पदार्थ (10माइक्रन से कम आकार) वा PM <sub>10</sub> , µg/m <sup>3</sup>	वार्षिक* 24 घंटे**	60 100	60 100	-हरात्मक विश्लेषण -टोयम -बीटा तनुकरण पद्धति

3187 GI/2009

(1)

4	विविक्त पदार्थ (2.5 माइक्रान से कम आकार या $PM_{2.5}$ , $\mu g/m^3$ )	वार्षिक* 24 घंटे**	40 60	40 60	-हवात्मक विश्लेषण -टोयम -बीटा तनुकरण पद्धति
5	ओजोन ( $O_3$ ) $\mu g/m^3$	8 घंटे** 1 घंटा**	100 180	100 180	-पराबैगनी द्विप्तिकाल -रासायनिक संदीप्ति -रासायनिक पद्धति
6	सीसा (Pb) $\mu g/m^3$	वार्षिक* 24 घंटे**	0.50 1.0	0.50 1.0	ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके AAS/ICP पद्धति -टेफ्लॉन फिल्टर पेपर का प्रयोग करते हुए ED-XRF
7	कार्बन मोनोक्साइड (CO) $mg/m^3$	8 घंटे** 1 घंटा**	02 04	02 04	-अविपेक्षी अवरक्त (NDIR) स्पेक्ट्रम मापन
8	अमोनिया ( $NH_3$ ) $\mu g/m^3$	वार्षिक* 24 घंटे**	100 400	100 400	-रासायनिक संदीप्ती -इण्डोफिनॉल ब्ल्यू पद्धति
9	बैन्जीन ( $C_6H_6$ ) $\mu g/m^3$	वार्षिक*	05	05	- गैस क्रोमेटोग्राफी आधारित सतत विश्लेषक -अधिशोषण तथा निशोषण के बाद गैस क्रोमेटोग्राफी
10	बैन्जो (ए) पाईरीन (BaP) केवल विविक्त कण, $ng/m^3$	वार्षिक*	01	01	-विलायक निष्कर्षण के बाद HPLC/GC द्वारा विश्लेषण
11	आर्सेनिक (As) $ng/m^3$	वार्षिक*	06	06	-असंवितरक अवरक्त स्पेक्ट्रमिती ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके ICP/AAS पद्धति
12	निकिल (Ni) $ng/m^3$	वार्षिक*	20	20	ई.पी.एम. 2000 या समरूप फिल्टर पेपर का प्रयोग करके ICP/AAS पद्धति

\* वर्ष में एक समान अंतरालों पर सप्ताह में दो बार प्रति 24 घंटे तक किसी एक स्थान विशेष पर लिये गये न्यूनतम 104 मापों का वार्षिक अंकगणीतीय औसत ।

\*\* वर्ष में 98 प्रतिशत समय पर 24 घंटे या 8 घंटे या 1 घंटा के मानीटर मापमान, जो लागू हो, अनुपालन किये जाएंगे । दो प्रतिशत समय पर यह मापमान अधिक हो सकता है, किन्तु क्रमिक दो मानीटर करने के दिनों पर नहीं ।

टिप्पणी:

1. जब कभी और जहां भी किसी अपने-अपने प्रवर्ग के लिये दो क्रमिक प्रबोधन दिनों पर मापित मूल्य, ऊपर विनिर्दिष्ट सीमा से अधिक हो तो इसे नियमित या निरंतर प्रबोधन तथा अतिरिक्त अन्वेषण करवाने के लिये पर्याप्त कारण समझा जायेगा ।

संत प्रसन्न गौतम, अध्यक्ष  
[शिकापन-III/4/184/09/अस.]

टिप्पणी: राष्ट्रीय परिवेशी वायु गुणवत्ता मानक संबंधी अधिसूचनाएँ, केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा भारत के राजपत्र आसाधरण में अधिसूचना संख्या का.आ. 384 (ई), दिनांक 11 अप्रैल, 1994 एवं का. आ. 935 (ई), दिनांक 14 अक्टूबर, 1998 द्वारा प्रकाशित की गयी थी ।



**NATIONAL AMBIENT AIR QUALITY STANDARDS  
CENTRAL POLLUTION CONTROL BOARD  
NOTIFICATION**

New Delhi, the 18th November, 2009

No. B-29016/20/90/PCI-L—In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No.14 of 1981), and in supersession of the Notification No(s). S.O. 384(E), dated 11<sup>th</sup> April, 1994 and S.O. 935(E), dated 14<sup>th</sup> October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

**NATIONAL AMBIENT AIR QUALITY STANDARDS**

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	Annual* 24 hours**	50 80	20 80	- Improved West and Gaeke -Ultraviolet fluorescence
2	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	Annual* 24 hours**	40 80	30 80	- Modified Jacob & Hochheiser (Na-Arsenite) - Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM <sub>10</sub> µg/m <sup>3</sup>	Annual* 24 hours**	60 100	60 100	- Gravimetric - TOEM - Beta attenuation
4	Particulate Matter (size less than 2.5µm) or PM <sub>2.5</sub> µg/m <sup>3</sup>	Annual* 24 hours**	40 60	40 60	- Gravimetric - TOEM - Beta attenuation
5	Ozone (O <sub>3</sub> ) µg/m <sup>3</sup>	8 hours** 1 hour**	100 180	100 180	- UV photometric - Chemiluminescence - Chemical Method
6	Lead (Pb) µg/m <sup>3</sup>	Annual* 24 hours**	0.50 1.0	0.50 1.0	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
7	Carbon Monoxide (CO) mg/m <sup>3</sup>	8 hours** 1 hour**	02 04	02 04	- Non Dispersive Infra Red (NDIR) spectroscopy
8	Ammonia (NH <sub>3</sub> ) µg/m <sup>3</sup>	Annual* 24 hours**	100 400	100 400	-Chemiluminescence -Indophenol blue method



(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C <sub>6</sub> H <sub>6</sub> ) µg/m <sup>3</sup>	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m <sup>3</sup>	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m <sup>3</sup>	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m <sup>3</sup>	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

\* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

\*\* 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

SANT PRASAD GAUTAM, Chairman  
[ADVT-III/4/184/09/Exty.]

**Note:** The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11<sup>th</sup> April, 1994 and S.O. 935(E), dated 14<sup>th</sup> October, 1998.



**Maharashtra Pollution Control Board**

**महाराष्ट्र प्रदूषण नियंत्रण मंडळ**

**Maharashtra Pollution Control Board**

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*...towards global  
sustainable development*

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