Central Pollution Control Board

* Statutory organisation under MoEF
* Constituted in September, 1974
* Apex body for pollution control in India
* Head office in Delhi, with seven zonal offices
  * Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air.
  * Execution of nation-wide programs for the prevention, control or abatement of water and air pollution;
  * Dissemination of Information

About South Zonal Office, Bengaluru…

* Estd October 1988

* Jurisdiction of Karnataka, Tamil Nadu, Kerala, Andhra Pradesh, Telangana & Goa, Pondicherry and Lakshadweep

* Covers area 639474 Sq km and coastal stretch of 3025 km.

Important activities

* Surveillance of air and water quality monitoring stations
* Inspection of industries under ESS
* Interstate river monitoring
* Organisation of Mass awareness programme
* Inspection of laboratories for recognition
* Co-ordination with all concerned SPCB's/PCC's/ organizations engaged in Pollution Control Activities
* Review of critically polluted areas
* Monitoring of STP's, CETP's, TSDF, HCE's, CBMWTF's,

Environmental Issues in Bengaluru

Graphics: Naveen Kumar

* Area 741 Sqkm
* population of about 8.42 million
* Population density per sqkm 11371
* residential areas around 40.4%, industrial-6.9%, commercial-2.7, Transport/ roads-24.3%, green cover 21.5, others 4.2%
* Around 270 large and medium scale industries and around 70,000 SSI
* Consumption/capita/year
  * Lpg-30kg, diesel-57.9 liter, petrol-39.4liter
* Vehicle Population in Bengaluru City (up to 30-11-2014)

Two wheelers	LMV	A/R	HTV	HGV	Others	Total
3725435	110297	146481	112914	72442	232598	5392847

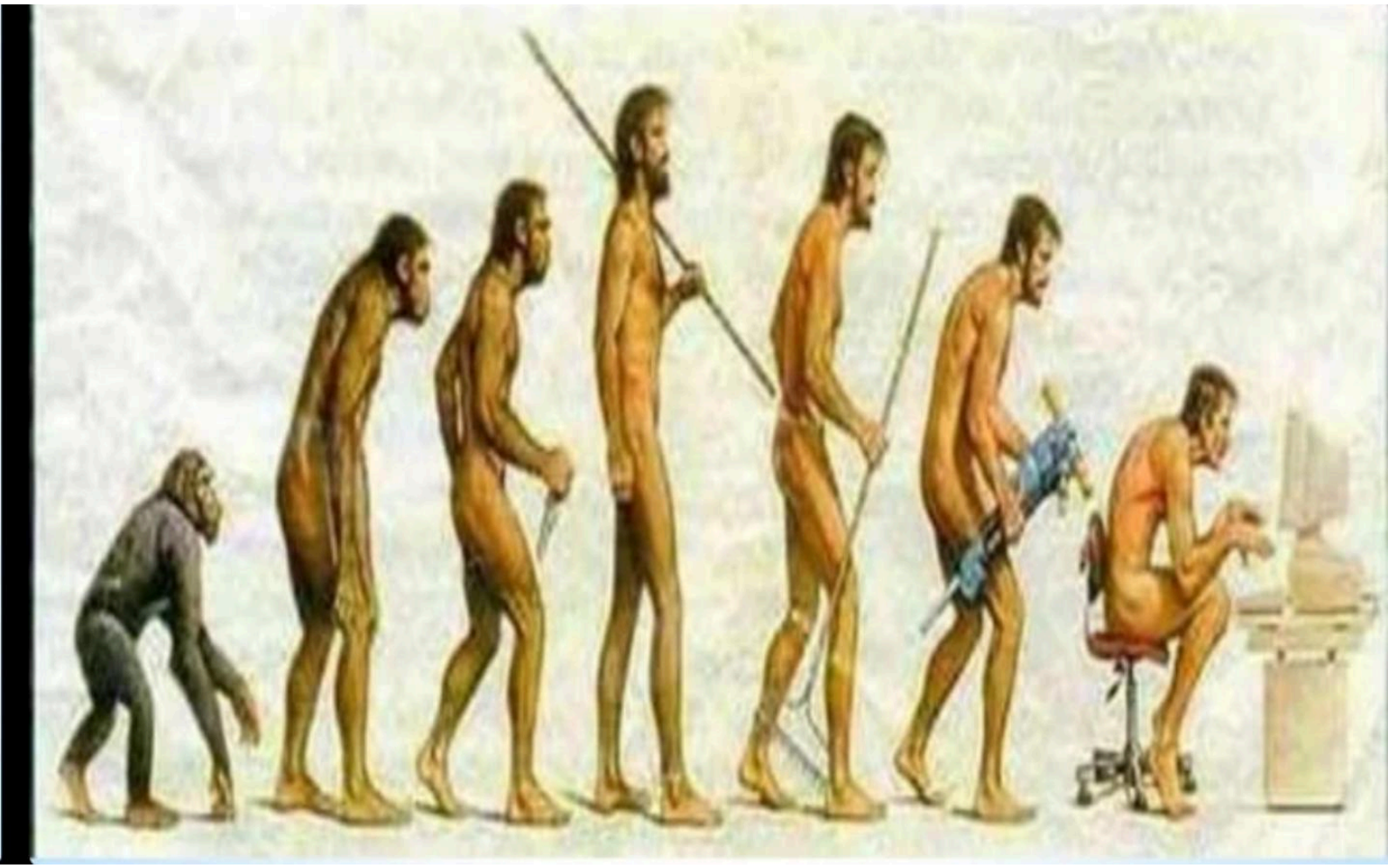
Air quality status?

Bangalore is so polluted that I am scared to come out of your womb. I am safe here!

Average values of air pollutants at 13 places of Bangalore City for the month of Jan-2015, and up to 3rd week of Feb- 2015

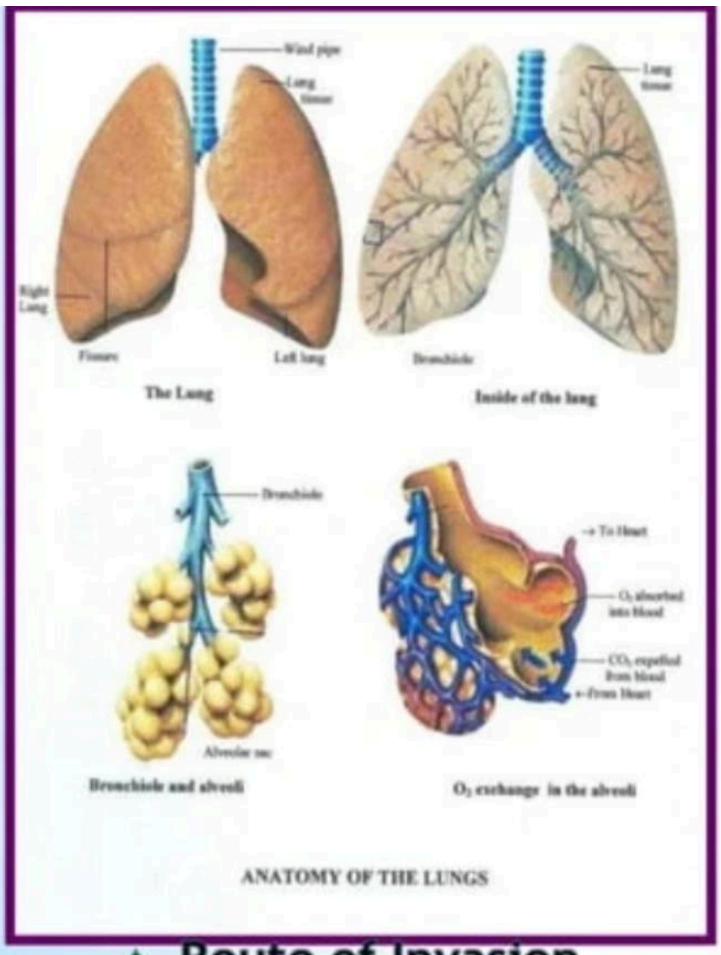
Sl. No.	Name of the Station	For the month of January - 2015				Up to 3rd Week of Feb-2015			
		SO2 µg/m3	NO2 µg/m3	RSPM µg/m3	RSPM Exceedence (%)	SO2 µg/m3	NO2 µg/m3	RSPM µg/m3	RSPM Exceedence (%)
	Standards/National limits	**80.0**	**80.0**	**100.0**		**80.0**	**80.0**	**100.0**	
1	Graphite India, White Field	6.7	35.8	**260.0**	**160.0 %**	6.2	34.3	**220.0**	**120.0 %**
2	K.H.B Industrial Area, Yelahanka	6.6	25.2	**180.0**	**80.0 %**	5.7	30.5	**147.0**	**47 .0 %**
3	Peenya Industrial Area(Gymkhana)	11.7	26.9	**119.0**	**19.0 %**	11.5	26.9	**123.0**	**23 .0 %**
4	Peenya Industrial Area (RO)	6.5	30.2	**156.0**	**56.0 %**	5.9	33.2	**164.0**	**64.0 %**
5	Yeshwanthpura Police Station	6.6	28.0	**191.0**	**91.0 %**	5.9	31.6	**218.0**	**118.0 %**
6	AMCO Batteries, Mysore Road	6.6	29.3	**211.0**	**111.0 %**	6.0	32.8	**228.0**	**128.0 %**
7	Central Silk Board , Hosur Road	6.5	29.0	**244.0**	**124.0 %**	6.2	31.9	**246.0**	**146.0 %**
8	DTDC House , Victoria Road	6.4	30.8	**249.0**	**149.0 %**	5.8	32.1	**192.0**	**92.0 %**
9	TERI Office, Domlur	5.1	11.0	55.0	Within the limit	5.6	11.0	57.0	Within the limit
10	Banswadi Police Station	10.2	24.6	81.0	Within the limit	9.9	24.6	81.0	Within the limit
11	Kajisonnenahalli ,	5.8	21.5	90.0	Within the limit	5.3	25.3	63.0	Within the limit
12	Victoria Hospital	6.3	29.1	**285.0**	**185.0 %**	5.8	32.5	**244.0**	**144.0 %**
13	Indira Gandhi Children Care Institute (NIMANHS)	6.3	29.8	**147.0**	**47.0 %**	5.8	31.4	**122.0**	**22.0 %**

* Unique topographical terrains
  * North Bengaluru is having flat terrains
  * South Bengaluru uneven landscape with intermingling hills and valleys
* average elevation of 900m
* Road length- 11,000 km
* Weak/No- Public suburban rail/metro transport seats
* Public bus transport/1000 population-35, para-public-352



Other reasons

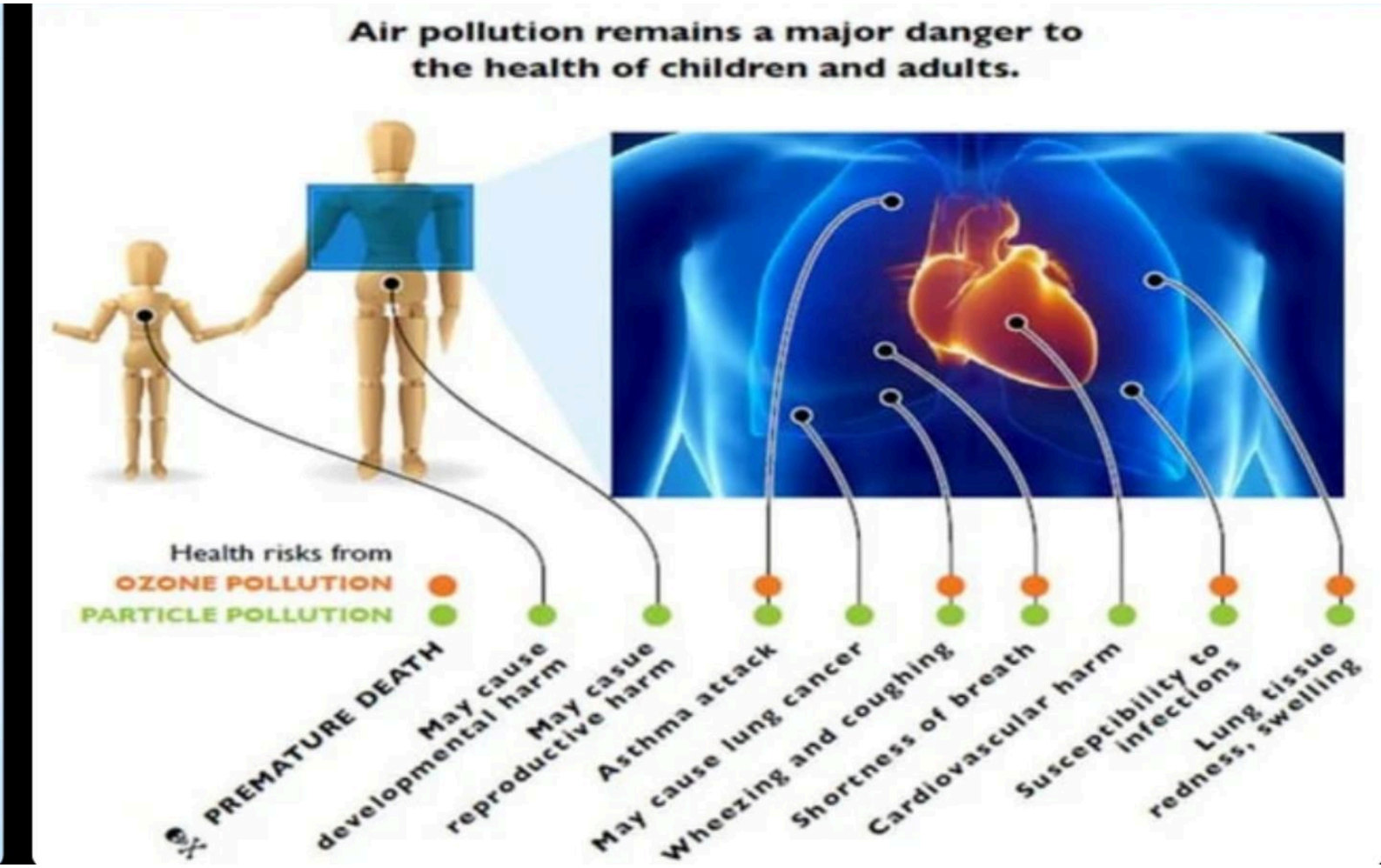
* Uncontrolled growth of vehicular population
* Type of vehicles on road (predominant old vehicles, Bharat Stage – II vehicles, 2W / 3W)
* Fuel quality issues
* Fuel adulteration issues
* Air pollution from SSI units (brick kiln, stone crusher, hotmix plants etc.)
* Large number of DG Sets (small power generating set run on liquid fuel)



ANATOMY OF THE LUNGS

- Lung - the main entry point of air pollutants, and the target organ is the alveolus. (There are 300 million alveoli in human lungs)
- 10,000 - 15,000 litres air enters every day in an adult lung.
- Increase in the concentration of pollutants cause parallel increase in the toxic insult to the lungs
- From the alveolus, pollutants travel via lymph or blood to different organs.

- Route of Invasion


Air pollution remains a major danger to the health of children and adults.
Health risks from
OZONE POLLUTION
PARTICLE POLLUTION
PREMATURE DEATH
May cause developmental harm
May casue reproductive harm
Asthma attack
May cause lung cancer
Wheezing and coughing
Shortness of breath
Cardiovascular harm
Susceptibility to infections
Lung tissue redness, swelling

Important Provision of Air Act, 1981

Function of Central Board under section 16(2)

(a) Advice the central government on any matter concerning the improvement of the quality of air and the prevention, control or abatement of air pollution,
(b) Plan and cause to be executed a nation vide programme for the prevention, control or abatement of air pollution;
(c) Co-ordinate the activities of the State and resolve disputed among them;
(d) Provide technical assistance and guidance to the State Boards, carry out and sponsor investigations and research relating to problems of air pollution and prevention, control or abatement of air pollution;
(e) Plan and organise the training of persons engaged or to be engaged in programmes for the prevention, control or abatement of air pollution on such terms and conditions as the Central Board may specify;

(f) organise through mass media a comprehensive programme regarding the prevention, control or abatement of air pollution;

(g) collect, compile and publish technical and statistical data relating to air pollution and the measures devised for its effective prevention, control or abatement and prepare manuals, codes or guides relating to prevention, control or abatement of air pollution;

(h) lay down standards for the quality of air;

(i) collect and disseminate information in respect of matters relating to air pollution;

(j) perform such other functions as may be prescribed

Function of State Pollution Control Boards under section 17(1)

(a) To plan a comprehensive programme for the prevention control or abatement of air pollution and to secure the execution thereof;

(b) To advice the state government on any matter concerning the prevention control or abatement of air pollution;

(c) To collect and disseminate information relating to air pollution;

(d) To collaborate with central board in organising the training of persons engaged or to be engaged in programmes relating to prevention, control or abatement of air pollution and to organise mass education programme relating thereto;

(e) To inspect, at all reasonable times, any control equipment, industrial plant or manufacturing process and to give, by order, such direction to such person as it may consider necessary to take step for the prevention, control or abatement of air pollution;

(f) To inspect air pollution control areas at such intervals as it may think necessary, assess the quality therein and take steps for the prevention, control or abatement of air pollution in such areas

(g) To lay down in consultation with Central Board and having regard to the standards for the quality of air laid down by the Central Boards, standards for the emission of air pollution into the atmosphere from industrial plants and automobiles or for the discharge of any air pollutants into the atmosphere from any other source whatsoever not being a ship or an aircraft; provided the different standards for emission may be laid down under the clause for different industrial plants having regard to the quantity and composition of emission of air pollutants into the atmosphere from such industrial plants;

(h) To advice the state government with respect to the suitability of any premises or location for carrying on any industry which is likely to cause air pollution;

(i) To perform such other functions as may be prescribed by the central board or the state government;

Section 18 of Air Act – Power to give directions

1. In the performance of its function under this act

(a) The central board shall be bound by such directions in writing as the central government may give to it; and
(b) Every state board shall be bound by such direction in writing as the central board or the state government may give to it;

Section 19 - Power to declare air pollution control areas

The State Government may, after consultation with the State Board, by notification in official gazette declared in such manner as may be prescribed, any area or areas within the State as air pollution control area or areas for the purposes of this act.

Section 31 (A) of Air Act – Power to give directions

1. Notwithstanding anything contained in any other law, but subject to the provsions of this Act, and to any directions that Central Government may give in this behalf, a Board may, in the exercise of its powers and performance of its functioning under this Act, issue any directions in writing to any person, officer or authority, and such person, officers or authority shall be bound to comply with such directions.

   Explanation : for the avoidance of doubts, it is hereby declared that the power to issue directions under this section, includes the power to direct –

(a) The closure, prohibition or regulation of any industry, operation or process ; or
(b) The stoppage or regulation of supply of electricity, water or any other service.

AMBIENT AIR QUALITY STANDARDS 2009

S.No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement	Remarks
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Sulphur Dioxide (SO_2), µg/m^3	Annual* 24 hours**	50 80	20 80	a) Improved West and Gaeke b) Ultraviolet fluorescence	Facilities available
2.	Nitrogen Dioxide (NO_2), µg/m^3	Annual* 24 hours**	40 80	30 80	a) Modified Jacob & Hocheiser (Na-Arsenite) b) Chemiluminiscence	Facilities available

Contd..

3.	Particulate Matter (size less than 10 µm) or PM_{10} µg/m^3	Annual* 24 hours**	60 100	60 100	a) Gravimetric b) TOEM c) Beta attenuation	• Most of the NAMP Stations have Gravimetric measurement facility including CPCB • CAQMS is having BAM • TEOM has to be introduced gradually
4.	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$ µg/m^3	Annual* 24 hours**	40 60	40 60	a) Gravimetric b) TOEM c) Beta attenuation	• Gravimetric measurement facility may be developed countrywide • CAQMS is having BAM • TEOM is yet to be introduced gradually
5.	Ozone (O_3) µg/m^3	8 hours* 1 hour**	100 180	100 180	a) UV photometric b) Chemiluminiscence c) Chemical Method	• CAQMS equipped with UV based or Chemiluminescence Online Analysers and may be used for 1 hrly data • Chemical method may be adopted nationwide but monitoring hours is not specified, however 09 hrs to 17 hrs may be introduced

6.	Lead (Pb) $\mu g/m^3$	Annual* 24hours**	0.5 1.0	0.5 1.0	a) AAS/ICP method after sampling on EPM 2000 or equivalent filter paper b) ED-XRF using Teflon filter	• It appears that Pb is to be monitored in PM_{10}, this standard already exists but monitored in SPM only at few locations. • Once the sampling is done in Teflon the same may also be analyzed by other method ED-XRF
7.	Carbon Monoxide (CO) $\mu g/m^3$	8 hours* 1 hour**	02 04	02 04	Non Dispersiv Infra Red (NDIR) spectroscopy	• Only option is to go with online analyzer
8.	Ammonia (NH_3) $\mu g/m^3$	Annual* 24hours**	100 400	100 400	a)Chemiluminiscence b) Indophenol blue method	• Recently introduced at few locations in CAQMS • Chemical method may be adopted nationwide
9.	Benzene (C_6H_6) $\mu g/m^3$	Annual*	05	05	a)Gas chromatography based continuous analyzer b) Adsorption and Desorption followed by GC analysis	• BTX analysers are being used at CAQMS • Active 24 hourly sampling in diffusion tubes followed by desorption in CS_2 and finally GC Analysis may be adopted

10.	Benzo(a) Pyrene (BaP) – particulat e phase only, ng/m^3	Annual*	01	01	Solvent extraction followed by HPLC/GC analysis	• Facilities available with CPCB but BIS method using GC-FID may not attain the desired lowest concentration level below 1ng/m^3 alternatively GC-MS or HPLC-UV Fluorescence may be provided
11.	Arsenic (As), ng/m^3	Annual*	06	06	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper	• It appears that 'As' is to be monitored in PM_{10}. • Micro-wave digester is required for digestion alternatively acid digestion at 70^0 C for 12 hours is required.
12.	Nickel (Ni), ng/m^3	Annual*	20	20	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper	• It appears that 'Ni' is to be monitored in PM_{10}. • Micro-wave digester is required for digestion alternatively acid digestion at 70^0 C for 12 hours is required.