Annual Report
2013-14

Central Pollution Control Board
Ministry of Environment, Forest & Climate Change
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Text Compilation & Editing	: Shri J.S. Kamyotra, Dr. C.S. Sharma, Shri Shriance Jain, Shri V.P. Yadav, Shri Nazimuddin, Shri Anand Kumar & Ms. Anamika Sagar
Printing Supervision & Layout	: Shri Shriance Jain, Ms. Anamika Sagar and Shri Satish Kumar
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CHAPTER I

INTRODUCTION

The Central Government constituted the **'Central Board for the Prevention and Control of Water Pollution'** on September 23, 1974. Under the provisions of The Water (Prevention & Control of Pollution) Act, 1974, the name of the Central Board was amended to **Central Pollution Control Board (CPCB)** under the Water (Prevention & Control of Pollution) Amendment Act, 1988 (No. 53 of 1988). Since May, 1981 the Central Pollution Control Board has been entrusted with the added responsibilities of Air Pollution Control under the provisions of the Air (Prevention and Control of Pollution) Act, 1981. The enactment of the Environment (Protection) Act, 1986, an umbrella legislation for enforcement of measures for protection of environment and notifications of several Rules under the Act widened the scope of activities of the Central Pollution Control Board.

The CPCB has been playing a key role in abatement and control of pollution in the country by generating, compiling and collating data, providing scientific information, rendering technical inputs for formulation of national policies and programmes, training and development of manpower and promoting awareness at different levels of the Government and Public at large.

1.1 FUNCTIONS OF THE CENTRAL BOARD

The main functions of CPCB, as spelt out in The Water (Prevention and Control of Pollution) Act, 1974, and The Air (Prevention and Control of Pollution) Act, 1981, are:

(i) To promote cleanliness of streams and wells in different areas of the States through prevention, control and abatement of water pollution; and,

(ii) To improve the quality of air and to prevent, control or abate air pollution in the country.

In addition to these main functions of promoting cleanliness of streams and wells, improving the quality of air and to prevent, control or abate air pollution, CPCB has been assigned the following functional at National Level:

- Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air;
- Plan and cause to be executed a nationwide programme for the prevention, control or abatement of water and air pollution;

- Co-ordinate the activities of the State Boards and resolve disputes among them;
- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigations and research relating to problems of water and air pollution, and for their prevention, control or abatement;
- Plan and organise training of persons engaged in programmes for prevention, control or abatement of water and air pollution;
- Organise through mass media, a comprehensive mass awareness programme on prevention, control or abatement of water and air pollution;
- Collect, compile and publish technical and statistical data relating to water and air pollution and the measures devised for their effective prevention, control or abatement;
- Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts;
- Disseminate information in respect of matters relating to water and air pollution and their prevention and control;
- Lay down, modify or annul, in consultation with the State Governments concerned, the standards for stream or well, and lay down standards for the quality of air;
- Establish or recognize laboratories to enable the Board to perform, and;
- Perform such other functions as and when prescribed by the Government of India.

1.2 FUNCTIONS OF THE CENTRAL BOARD AS STATE BOARD FOR THE UNION TERRITORIES

- Advise the Governments of Union Territories with respect to the suitability of any premises or location for carrying on any industry which is likely to pollute a stream or well or cause air pollution;
- Lay down standards for treatment of sewage and trade effluents and for emissions from automobiles, industrial plants, and any other polluting source;
- Evolve efficient methods for disposal of sewage and trade effluents on land;
- Develop reliable and economically viable methods for treatment of sewage, trade effluents and air pollution control equipment;
- Identify any area or areas within Union Territories as air pollution control area or areas to be notified under The Air (Prevention and Control of Pollution) Act, 1981; and
- Assess the quality of ambient air and water, and inspect wastewater treatment installations, air pollution control equipments, industrial plants or manufacturing processes to evaluate their performance and to take steps for the prevention, control and abatement of air and water pollution.

1.3 DELEGATION OF POWERS BY CENTRAL POLLUTION CONTROL BOARD

As per the policy decision of the Government of India, the Central Pollution Control Board, delegated its powers and functions from time to time under Section 4, Sub Section 4 of The Water (Prevention and Control of Pollution) Act, 1974 and Section 6 of The Air (Prevention and Control of Pollution) Act, 1981 with respect to various Union Territories to respective Pollution Control Committees under the administrative control of local Administration **(Annexure-I).**

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CHAPTER II

CONSTITUTION OF THE CENTRAL BOARD

2.1 According to the provisions of The Water (Prevention & Control of Pollution) Act, 1974, the Central Board consists of the following members:

- A fulltime Chairman, being a person having special knowledge or practical experience in respect of matters relating to environmental protection or a person having knowledge and experience in administering institutions dealing with the matters aforesaid, to be nominated by the Central Government;
- such number of officials, not exceeding five, to be nominated by the Central Government to represent Government;
- such number of persons, not exceeding five, to be nominated by the Central Government, from amongst the members of the State Boards, of whom not exceeding two shall be from amongst the members of the local authorities;
- such number of nonofficials, not exceeding three to be nominated by the Central Government, to represent the interest of agriculture, fishery or industry or trade or any other interest which, in the opinion of the Central Government, ought to be represented;
- two persons to represent the companies or corporations owned, controlled or managed by the Central Government, to be nominated by the Government; and
- A fulltime Member Secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the Central Government.

2.2 List of Board Members during the year 2013 - 2014 is provided at **Annexure-II.** The organisation structure of the Central Pollution Control Board is provided at **Annexure-III.** Staff strength as on March 31, 2014 is furnished in **Annexure-IV.**

CHAPTER III

MEETINGS OF CENTRAL POLLUTION CONTROL BOARD

3.1 MEETINGS OF THE CENTRAL BOARD

During the reporting period (i.e. April 1, 2013 to March 31, 2014), one meeting of the Central Board was held as under:

S.No.	Meeting No.	Date	Place
1.	164th	January 21, 2014	MoEF, New Delhi

3.2 MAJOR DECISIONS TAKEN BY THE BOARD

1. Approved the Road Map for Development of Standards.
2. Approved the revision of capital and operation & maintenance cost for up gradation / establishment of new ambient air quality station under NAMP.
3. Approved EFC Memo of CPCB-12th five year plan and Annual Action Plan for 2013-14.
4. Approved the Annual Report of CPCB for the year 2012-2013.
5. Approved the CPCB Annual Audit Report for the Financial Year 2012 – 2013.
6. Statutory Appeal of Shri Sisrikar against Disciplinary Authority Order dt. 29.05.2013 imposing penalty of “reduction to minimum of the pay structure of Grade Pay of Rs. 4800/- in PB-2 Rs. 9300-34800 i.e. Rs.13,350/-, was turned down by the Board.
7. Approved the Monitorable Targets – “States to meet National Ambient Air Quality Standards (NAAQS) in urban areas by 2017” - “Setting up of Continuous Ambient Air Quality Monitoring Stations in one Million-plus Cities”.
8. Approved the Monitorable targets “Clean 80% of Critically Polluted Stretches in rivers by 2017 and 100% by 2020” – assessment of water quality of polluted river stretches on real time basis.
9. Approved the development of Air Quality Index for Indian Cities.
10. Approved the constitution of Task Forces for 17 categories of highly polluting industries for enhancing pollution compliance status and enforcement mechanism.
11. Approved the proposed Effluent and Emission Standards for Fertilizer Industries.
12. Approved the proposed Effluent and Emission Standards for Pulp & Paper Industries.
13. Approved the Annual Action Plan 2014-15.

3.3 NATIONAL CONFERENCE

The 58th Conference of Chairmen & Member Secretaries of Pollution Control Boards / Committees (SPCBs/PCCs) was organised during February 21-22, 2014 at Bengaluru. Over 90 participants from 27 SPCBs / PCCs, MoEF, and CPCB attended the meeting.

58th Conference of Chairmen & Member Secretaries of PCB's/PCC's

The major issues discussed during the meeting are as follows:

- ❖ Monitorable target in XII Plan – States to meet National Ambient Air Quality Standards - Setting up of Continuous Ambient Air Quality Monitoring Stations in one Million-plus Cities
- ❖ Evolving Air Quality Index for rankingof cities
- ❖ Demonstration of Urb - Air System
- ❖ Setting Monitorable target in XII Plan for clearning Polluted River Stretches and Setting-up of Continuous Water Quality Monitoring Stations in Polluted River Stretches
- ❖ Assessment of Water Quality based on Primary Water Quality Criteria – Review
- ❖ Monitoring Ground Water Quality in coordination with Central Ground Water Board (CGWB) and State Ground Water Board (SGWB)

- ❖ Inventorization of Industries under (i) 17 category of highly polluting and (ii) grossly polluting industries
- ❖ Direction to SPCBs/PCCs regarding self-monitoring of compliance by setting-up of online effluent and emission monitoring systems in highly polluting industries, CETPs, CHWTSDFs and CBMWTFs
- ❖ Criteria for imposing Bank Guarantee vis-à-vis provisions in the Environmental Statutes
- ❖ Harmonization of Categorization of Industries under Red / Orange / Green categories
- ❖ Revision of Water Cess Rates
- ❖ Review of implementation of EPA Rules relating to Hazardous Waste, Bio Medical Waste, Plastic Waste, Municipal Solid Waste, E-Waste, Batteries Waste
- ❖ Road map for strengthing of Real Time Ambient Noise Monitoring Network
- ❖ Implementation of online consent mechanism by SPCBs/PCCs
- ❖ Strengthening of Pollution Control Boards / Committees
- ❖ Man Power Requirement of State Boards
- ❖ Environmental Auditing of Industrial units

3.4 5TH REGIONAL CHAIRMEN AND MEMBER SECRETARIES CONFERENCE OF SOUTHERN SPCBS/PCCS

- 5th Regional Chairmen and Member Secretaries Conference of Southern SPCBs/ PCCs was organized on January 10, 2014 at CPCB Zonal Office, Bengaluru. Over 20 participants from five states, one Union territory and MoEF, southern zone regional office participated in the conference.

5th Interaction Meet of Chairmen and Member Secretaries South Zone

- The Specific region wise as well as common issues were discussed and concluded with remedial action plans to be implemented in time bound manner.The conference paved way to further strengthen co-ordination between

CPCB and SPCB's and to solve interstate disputes and to enhance interstate relationship.

- The conference concluded by agreeing to use science and innovation as critical tools to boost the development and for pollution mitigation in the country.


3.5 MEETING TO REVIEW THE STATUS OF PIPELINES CARRYING CRUDE OIL/ PETROLEUM PRODUCTS ON EXISTING PIPELINE IN CHENNAI

A meeting was organized to review the status of pipelines carrying crude oil/ petroleum products on existing pipeline to transport of petroleum raw material/products from source and disseminate points in Tamil Nadu along with TNPCB officials and stakeholders at Chennai during April 27, 2013. The meeting was chaired by Hon'ble Minister for Ministry of Environment and Forests, Government of India.

Based on the recommendations of the meeting, this office has made detailed survey and prepared the comprehensive report on "Overview on Status of pipelines carrying crude oil/petroleum products from ports and refineries of South India" .

Subsequently, a meeting was organised in Chennai with all major oil companies to assess the status of safety measures adopted in the pipelines carrying the oil. This meeting was very crucial in light of the leakages occurred from the pipelines belonging to M/s BPCL, Chennai.

CHAPTER IV

COMMITTEES CONSTITUTED BY THE BOARD & THEIR ACTIVITIES

4.1 NATIONAL TASK FORCE FOR IRON & STEEL SECTOR

National Task Force (NTF) for Integrated Iron & Steel Industries was initially constituted in the year 2003 for monitoring implementation of action points identified under CREP. The committee has been reconstituted and comprises of representatives from Ministry of Steel, Ministry of Environment & Forests, industries, and CPCB. NTF had been meeting regularly, and with its persuasion substantial progress on implementation of CREP action points was made. Last NTF meeting was held on October 22, 2013 where various issues related to compliance to environmental norms and additional actions required for improving the environmental performance of the sector were discussed. As per the latest CREP compliance data no industry could utilize its 100% slag. M/s. JSW and NCCBM are carrying out study to find out scientific solution for utilization of 100% LD slag.

4.2 TECHNICAL COMMITTEE ON WEST BENGAL BRICK KILNS (CONSTITUTED BY NGT ORDER DATED 27.5.2013)

The case of W.P. 5574 of 2007 - Bengal Brick Field Owners Association Vs West Bengal Pollution Control Board and the case of W.P. 13044 of 2007 – Nadia District Brick Manufacturers Association Vs West Bengal Pollution Control Board in the Hon'ble High of West Bengal at Kolkata were transferred by the Hon'ble High Court's order dated 22.1.2013 to the National Green Tribunal and admitted as Application No. 79 (THC) of 2013 and Application No. 80 (THC) of 2013, respectively. During the course of hearing of these Applications the counsel for the Applicants submitted before the National Green Tribunal that the Report submitted in 2007 by the Expert Committee constituted by West Bengal Pollution Control Board was not accepted by State and Central Boards and Ministry of Environment and Forests, Government of India and requested the National Green Tribunal for constitution of another Committee to study the merits and demerits of the previous Report of the Expert Committee. This submission was accepted and an Order was passed by the Hon'ble National Green Tribunal on 27th May 2013 for constitution of a Technical Committee, comprising a representatives of NEERI, CPCB, WBPCB and two experts from the fields of Agronomy and Horticulture respectively from IARI, to examine the matter and submit the report. According to the Order, the Technical Committee was required to visit the places in questions, study the issues involved and answer the following:

Whether it agrees with the report already filed by the earlier Expert Committee, a copy of which shall be furnished to it.

Whether the Applicants at all can be permitted to operate in that area particularly in the vicinity of the mango orchards, and if yes, what measures are expected to be taken by them to check environmental pollution caused by their operations in face of letter of the Ministry of Environment & Forests dated 1st October 2007.

Consequent to the Order passed by the Hon'ble National Green Tribunal, the Technical Committee comprising following officers was constituted:

Dr. C.V. C. Rao, Chief Scientist, NEERI
Dr A. K. Singh, Head, Division of Fruits & Horticulture Technology, IARI,
Dr. A. K. Vyas, Head, Division of Agronomy, IARI
Mr. Bimalendu Mal, Environmental Engineer, WBPCB
Mr. U. N. Singh, Additional Director & I/c PCI-SSI, CPCB
(The Technical Committee was assisted by Mr. Nazim uddin, SEE, PCI-SSI, CPCB)

The Technical Committee visited seven brick kilns and the mango orchards near the brick kilns during its site visit of the areas from 17th to 19th June 2013 and submitted its report to National Green Tribunal.

4.3 RE-CONSTITUTION OF COMMITTEES ON NOISE POLLUTION CONTROL

"National Committee on Noise Pollution Control" has been reconstituted with additional expert members Prof. Nachiketa Tiwari, IIT, Kanpur and Prof. Sateesh Sharma, IIT, Roorkee.

Another committee "Standing Committee on emission for off road vehicles and construction equipments" has been reconstituted with new member Prof A. Ramesh. IIT, Madras and Prof Amit Pal, DTU in place of Ex. Prof H. B. Mathur, IIT, Delhi and Prof B. P. Pundir, IIT, Kanpur due to non-availability of the latter members.

CHAPTER V

AIR AND WATER QUALITY MONITORING

5.1 WATER QUALITY MONITORING

5.1.1 National Water Quality Monitoring Programme (NWQMP)

The National Water Quality Monitoring network comprises of 2500 stations covering 28 States and 6 Union Territories spread over the country. The monitoring results obtained during year 2012 indicate that organic pollution continues to be the predominant pollution of aquatic resources. The organic pollution measured in terms of bio-chemical oxygen demand (BOD) & Coliform bacterial count gives the indication of extent of water quality degradation in different parts of our country. The monitoring data reveis 63% of the observations had BOD volues less than 3 mg/l, 19% between 3-6 mg/l & 18% above 6 mg/l. Similarly for Total & Faecal coliform, which indicate presence of pathogens in water and are of major concern, about 50% observations of Total Coliforms and 65% observations of Faecal Coliform had volue less than 500 MPN /100 ml.

5.1.1.1 Water Quality In Rivers/Lakes/Ponds/Tanks for the Criteria parameters (BOD, DO, TC & FC)

(a) BOD

The maximum BOD (one of the important indicator of pollution) levels observed in various rivers are presented in Figs. 5.1 to 5.4. Relatively low values of BOD were observed in river Baitarni.

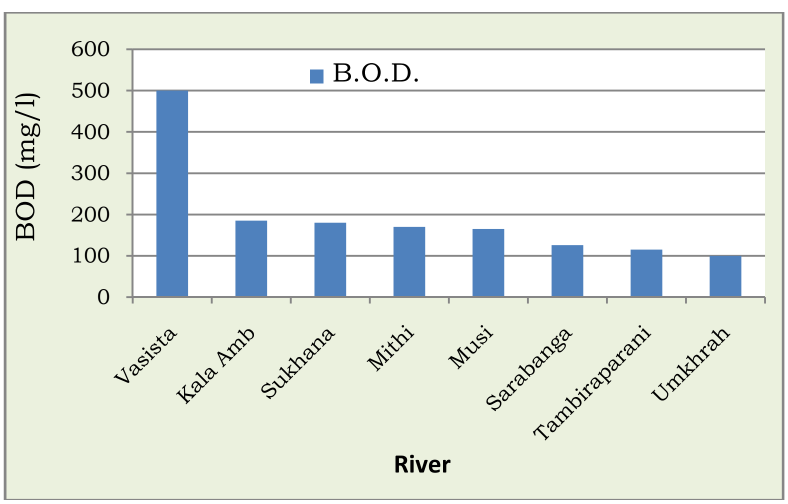


Figure 5.1: River bodies having BOD between 100 - 500 mg/l

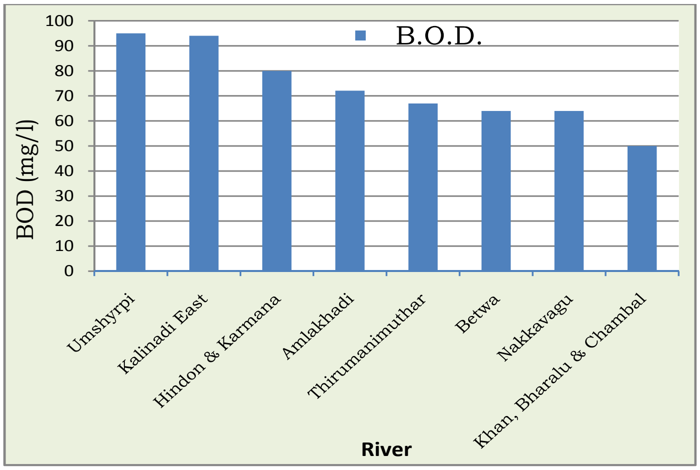


Figure 5.2: River bodies having BOD between 50 -100 mg/l

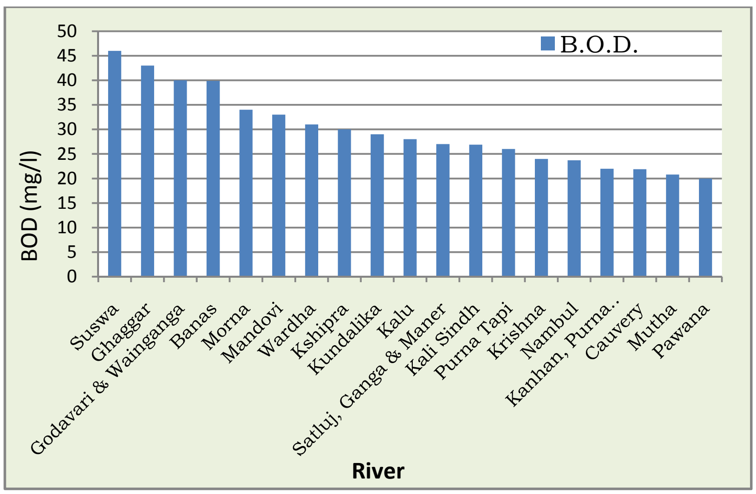


Figure 5.3: River bodies having BOD between 20-50 mg/l

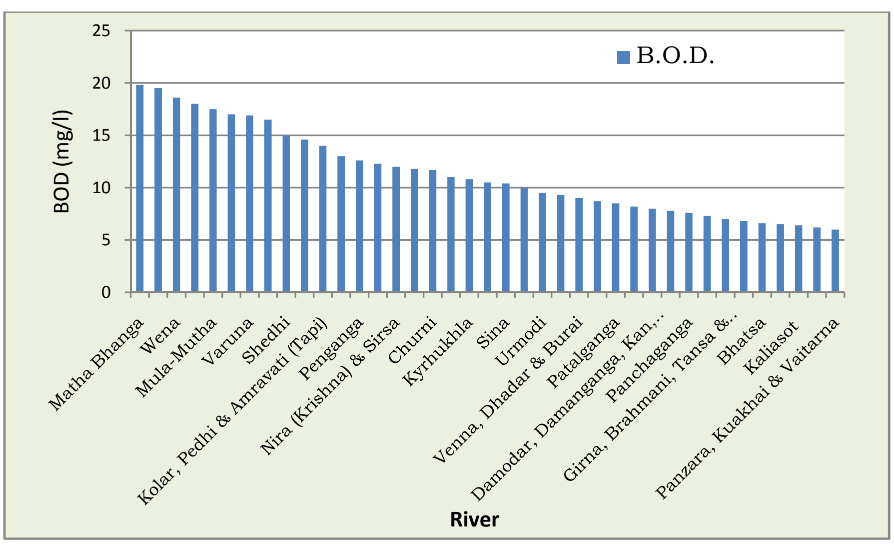


Figure 5.4: River bodies having BOD between 5-20 mg/l

The Lakes, Ponds and Tanks having maximum Biochemical Oxygen Demand (BOD) are summarised in table –5.1.

Table 5.1: Highest observed BOD Levels in Lakes, Tanks & Ponds

Location	State	BOD (mg/l)	Location	State	BOD (mg/l)
Sai Chevuru	Andhra Pradesh	520	Himayat Sagar Lake	Andhra Pradesh	22
Riwalsar Lake	Himachal Pradesh	305	Dharmasagar Tank Ulsoor Lake	Andhra Pradesh Karnataka	21
Premajipet Tank	Andhra Pradesh	218	Lower Lake Ramappa Lake	Madhya Pradesh Andhra Pradesh	20
Pedda Chevuru	Andhra Pradesh	206	Ashthamudi Lake Parvati Sagar Pond	Kerala Orissa	18
Nalla Chevuru	Andhra Pradesh	126	Curtorim Lake Shahpura Lake	Goa Madhya Pradesh	16
Rangadhamuni Cheruvu	Andhra Pradesh	121	Chanam Pukhuri	Manipur	15
Laxminarayana Chevuru	Andhra Pradesh	120	Pushkar Lake	Rajasthan	15
Hussain Sagar Lake & Safilguda Lake	Andhra Pradesh	110	Jalmahal Padumpukhuri	Rajasthan Assam	15
Hasmathpet Lake	Andhra Pradesh	92	Dighali Pukhuri	Assam	14
Kistareddypet Tank	Andhra Pradesh	90	City Lake	Gujarat	14
Langarhouse Lake	Andhra Pradesh	88	Bhalswa Lake Markanda Pokhari	Delhi Orissa	13
Fox Sagar Lake	Andhra Pradesh	86	Lilong Pukhuri	Manipur	13
Noor Md. Kunta	Andhra Pradesh	84	Mansar Lake	Jammu & Kashmir	12
Saroonagar Lake	Andhra Pradesh	82	Kakwa Bazar Pond Kerwa Dam and Ranital Talab Narendra Pokhari	Manipur Madhya Pradesh Orissa	12
Banjara Lake	Andhra Pradesh	80	Rajadinia Pukhuri	Assam	12

Location	State	BOD (mg/l)	Location	State	BOD (mg/l)
Amber Cheruvu Udhagamadalem Lake	Andhra Pradesh Tamil Nadu	76	Umiam Lake	Meghalaya	11
Mallapur Tank	Andhra Pradesh	75	Bishnu Puskar Pukhuri	Assam	10
Chinna Waddepally Tank Pulicate Lake	Andhra Pradesh Tamil Nadu	70	Ward Lake	Meghalaya	10
Miralam Lake	Andhra Pradesh	69	Langmeidong Pukhri	Manipur	10
Durgam Chevuru	Andhra Pradesh	68	Janunia Talab	Madhya Pradesh	10
Asani Kunta	Andhra Pradesh	64	Gophur Tank Hitkasa Tailing Dam Sahebbandh Saipem Lake	Assam Chhattisgarh West Bengal Goa	9
Kapra Cheruvu	Andhra Pradesh	59	Subhagya Kunda Pond	Assam	9
Shameerpet Lake	Andhra Pradesh	55	Loktak Lake	Manipur	9
Khaziar Lake Waddepally Tank & Pragathinagar Cheruvu	Himachal Pradesh Andhra Pradesh	52	Lalambung Pond & Ningthem Pukhuri Porur Lake Jaipal Pukhuri, Indradyumna Tank, Hanumantal Bibinagar Tank	Manipur Tamil Nadu Assam Orissa Madhya Pradesh Andhra Pradesh	8
Bhadrakali Chevuru	Andhra Pradesh	48			
Kajipally Tank	Andhra Pradesh	40	Deepar Beel	Assam	8
Laxmi Pond	Uttar Pradesh	38	Kayamkulam Lake	Kerala	8
Bindusagar Pond Nalsarovar Lake	Orissa Gujarat	35	Ganga Pukhuri	Assam	7
Gandigudem Pond	Andhra Pradesh	32	Upper Lake	Madhya Pradesh	7
Surinsar Lake	Jammu & Kashmir	32	Mirikh Lake	West Bengal	7

Location	State	BOD (mg/l)	Location	State	BOD (mg/l)
Mayem Lake	Goa	32	Kochbihar Lake	West Bengal	7
Swetaganga Pond	Orissa	32	Heballa Valley Lake	Karnataka	7
Maahil Pond	Uttar Pradesh	31	Daloni Beel & Rajmaw Pukhuri	Assam	7
Kongba Bazar Pond	Manipur	27	Veeranam Lake	Tamil Nadu	7
Kodai Kanal Lake Tarakeshwar Lake	Tamil Nadu West Bengal	26	Ramgarh Lake	Uttar Pradesh	6
Elangabeel System Pond	Assam	25	Mahamaya Mandir Pukhuri	Assam	6
Nehru Nagar Talab	Chhattisgarh	24	Multai Tank Saki Tank	Madhya Pradesh Andhra Pradesh	6

(b) Dissolved Oxygen (DO)

The DO level more than 4 mg/1 were observed in river Satluj, Baitarni, Brahmaputra, Mahi, Mahanadi and Pennar throughout the year whereas, Dissolved Oxygen values less than 4 mg/1 were observed in number of river stretches generally downstream of urban settlements due to discharge of untreated/partially treated municipal wastewater, which attributes to high oxygen demand. During the year 2012 lowest Dissolved Oxygen (one of the important indicator of pollution) levels observed in various rivers, in ascending order are summarised in table –5.2

Table 5.2: Lowest observed Dissolved Oxeygen (DO) levels in Rivers

Rivers	DO (mg/l)
Amlakhadi, Betwa, Bharalu, Chitrapuzha, Godavari, Kadambyar, Karmana, Khan, Kolak, Krishna, Kundu, Maner, Musi, Nambul, Sal, Sarabanga, Thirumanimuthar & Vasista	Nil
Ushyrpi	0.2
Brahmani, Dhansiri & Matha Bhanga	0.3
Dhela & Umkhrah	0.4
Churni	0.5
Ganga, Pawana, Suswa & Vindhyadhari	0.6
Bhalla, Mula-Mutha, Mutha, Periyar & Subarnarekha	0.8
Bhima & Mula	0.9
Dwarka & Hindon	1.0
Arkavathi, Banas, Gomti, Mapusa, Pamba & Varuna	1.2
Cauvery, Indrayani & Morna	1.3
Savitri	1.6
Devak & Yamuna	1.8
Kallai	1.9

Rivers	DO (mg/l)
Bhavani & Wainganga	2.0
Vamanapuram	2.1
Deepar Bill & Narmada	2.2
Chathe	2.3
Burai & Kabbani	2.4
Maniyankode Puzha, Nira, Sabarmati & Sirsa	2.5
Keecheri & Mithi	2.6
Markanda	2.8
Gomai, Kanhan, Lakshmantirtha & Patalganga	2.9
Darna, Kali Sindh, Kalu, Penganga, Purna, Puzhackal, Ramapuram & Vel	3.0
Chhapi, Palleru, Parvati & Wardha	3.1
Ghaggar, Ghod, Malprabha, Sukhana & Thirur	3.2
Kalisoat, Tapi & Tlawng	3.3
Jalangi, Mogral, Pedhi, Shedhi & Sirsia	3.4
Chambal, Kyrhukhla, Nonbah & Ram Rekha	3.5
Wena	3.6
Denwa, Ujad, Uppala & Wangjing	3.7
Beas, Hasdeo, Panchganga, Shriya, Tuirial & Vaitarna	3.8
Daya, Disang, Dzu, Girna, Kuakhai & Kundalika	3.9

(C) Total Colifom and Faecal Colifom

Total Coliform and Faecal Coliform level (an important indicator of pollution) have been observed very high in various rivers at a number of locations. The river Mahi and Pennar are relatively clean rivers as the number of Total Coliform and Faecal Coliform count are coinparatively less than criteria limit of 5000 MPN/100 ml and 2500 MPN/100 ml respectively. The highest TC & FC levels observed in rivers are summarised in table –5.3.

Table-5.3: Highest observed Total Coliform & Faecal Coliform levels in Rivers

Rivers	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
Yamuna	2×10^{10}	2×10^{10}
Vasista	2×10^{9}	9×10^{8}
Thirumanimuthar	3×10^{7}	2×10^{7}
Matha Bhanga	9×10^{6}	5×10^{6}
Sarabanga	5×10^{6}	4×10^{6}
Kalinadi West	5×10^{6}	1×10^{5}
Ganga	5×10^{6}	3×10^{6}
Damodar	5×10^{6}	3×10^{5}
Churni	3×10^{6}	2×10^{6}
Vindhyadhari	2×10^{6}	3×10^{5}
Varuna	2×10^{6}	2×10^{5}
Mahananda	2×10^{6}	9×10^{5}
Gomti	2×10^{6}	1×10^{5}
Rupnarayan	5×10^{5}	1×10^{5}

Rivers	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
Kali East	4×10^5	3×10^5
Hindon	3×10^5	2×10^5
Umkhrah & Jalangi	2×10^5	1×10^5
Teesta	2×10^5	33×10^3
Mahanadi	2×10^5	2×10^5
Kuakhai& Daya	2×10^5	54×10^3
Kathajodi & Brahmani	2×10^5	92×10^3
Karola, Barakar & Dwarka	2×10^5	9×10^4
Dwarkeshwar	2×10^5	35×10^3
Umshyrpi	1×10^5	9×10^4
Satluj	1×10^5	7×10^4
Kansi & Kaljani	1×10^5	5×10^4
Subarnarekha	92×10^3	54×10^3
Sai	92×10^3	7×10^4
Budhabalanga	92×10^3	35×10^3
Ghaggar	9×10^4	6×10^4
Amlakhadi	9×10^4	9×10^4
Chambal	79×10^3	45×10^2
Ramganga	75×10^3	21×10^3
Silabati	5×10^4	3×10^4
Zuari	35×10^3	11×10^3
Bicholim	35×10^3	24×10^3
Kallai	33×10^3	24×10^3
Karmana	3×10^4	5×10^3
Kabbani	28×10^3	58×10^2
Valvant	24×10^3	11×10^3
Sirsia	24×10^3	16×10^3
Sirsa, Harbora & Daha	24×10^3	9×10^3
Dhous	24×10^3	5×10^3
Sal	22×10^3	14×10^3
Mapusa	22×10^3	31×10^2
Mandovi	22×10^3	47×10^2
Cauvery	22×10^3	11×10^3
Betwa	22×10^3	5×10^3
Corapuzha	2×10^4	5×10^3
Kerandi & Baitarni	17×10^3	11×10^3
Tughabhadra	16×10^3	9×10^3
Ram Rekha, Kagina, Bhima & Manusmar	16×10^3	5×10^3
Lakshmantirtha	16×10^3	28×10^2
IB	16×10^3	92×10^2
Mayurkashi	14×10^3	7×10^3
Nagavalli	13×10^3	79×10^2
Kalna	13×10^3	23×10^2
Chapora	13×10^3	46×10^2
Assanora	13×10^3	49×10^2
Kushawati	11×10^3	23×10^2

Rivers	Total Coliform (MPN/100 ml)	Faecal Coliform (MPN/100 ml)
Khandepar	11×10^3	13×10^2
Aul	11×10^3	7×10^3
Bharalu	93×10^2	15×10^2
Vansadhara	92×10^2	33×10^2
Rushikulya	92×10^2	28×10^2
Kusei, Khanditara & Birupa	92×10^2	54×10^2
Koel	92×10^2	35×10^2
Narmada	9×10^3	5×10^3
Farmar	9×10^3	3×10^3
Kuppam	8×10^3	4×10^3
Saryu	71×10^2	43×10^2
Talpona	7×10^3	23×10^2
Puzhackal	7×10^3	17×10^2
Periyar	6×10^3	17×10^2
Musi	5940	16×10^2
Tel	54×10^2	28×10^2
Sankh	54×10^2	35×10^2
Valapattanam, Sikhrana & Muvathapuzha	5×10^3	3×10^2
Meenachil	5×10^3	32×10^2
Koshi, Korayar & Kamala	5×10^3	24×10^2
Chithrapuzha & Gandak	5×10^3	22×10^2
Burhi Gandak	5×10^3	17×10^2

5.1.2 Statewise Groundwater Quality

Groundwater quality assessment in 23 states/UTs with respect to conductivity & nitrate was conducted during the year and findings of the study are summarised in table-5.4.

Table-5.4: Statewise Groundwater Quality (Conductivity and Nitrate+Nitrite-N)

States/UTs	Conductivity (μmhos/cm) Range	Nitrate + Nitrite-N (mg/l) Range
Andhra Pradesh	49-68000	0.0-131
Assam, Meghalaya, Mizoram and Tripura	20-4510	0.0-23.50
Chattisgarh & Madhya Pradesh	0-11700	0.0-11.2
Himachal Pradesh, Chandigarh and Punjab	1-2150	0.0-185.0
Kerala	22-59800	0.0-12.40
Odisha	14-58400	0.01-15.7
Puducherry and Tamil Nadu	326-44600	0.01-0.37
Daman & Dadra Nagar Haveli	113-173	0.00-0.30
Maharashtra	1-67000	0-39.00
Gujarat	150-9010	0.0-12.8
Rajasthan	16-2900	0.02-11.6

States/UTs	Conductivity (µmhos/cm) Range	Nitrate + Nitrite-N (mg/l) Range
Uttar Pradesh and Uttarakhand	0-2560	0.0-10.0
Bihar	83-910	-
West Bengal	5-29500	0.0-2.43

5.1.3 Real Time Water Quality Monitoring

Central Pollution Control Board under Hydrology Project-II has installed ten (10) Real Time Water Quality Monitoring Stations on River Ganga at 8 station namely Haridwar- Upper Ganga Barrage, Nanamau Bridge D/s, Jajmau Bridge Kanpur, Shastri Bridge U/s Allahabad, Varanasi – U/s and D/s, Gandhi Ghat, Patna, Garden Reach, Kolkata and two locations on River Yamuna- Delhi U/s and D/s.

These Monitoring stations are equipped to monitor ten water quality parameters viz. pH, Turbidity, Conductivity, Temperature, Dissolved Oxygen, Dissolved ammonia, Bio-chemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Nitrates and Chlorides as per the required frequency. The real time values for pH, Temp., BOD and Ammonical Nitrogen recorded at some of there stations are presected in Figures 5.5 to 5.8.

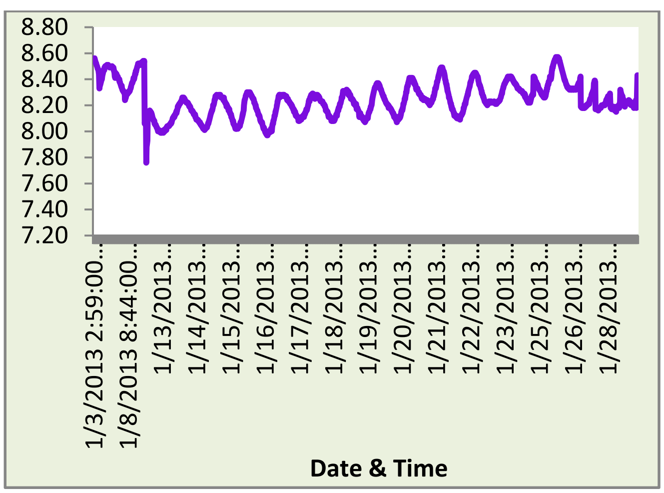


Figure 5.5: Real time values of pH in river Ganga at Allahabad

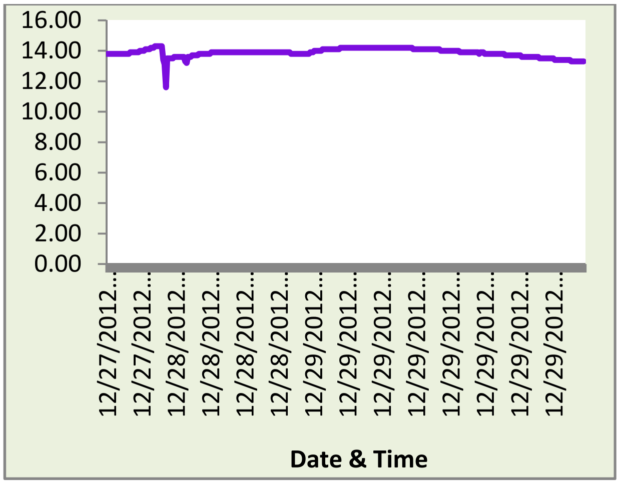


Figure 5.6: Real time values of Temperature (^{0}c) in river Ganga at Allahabad

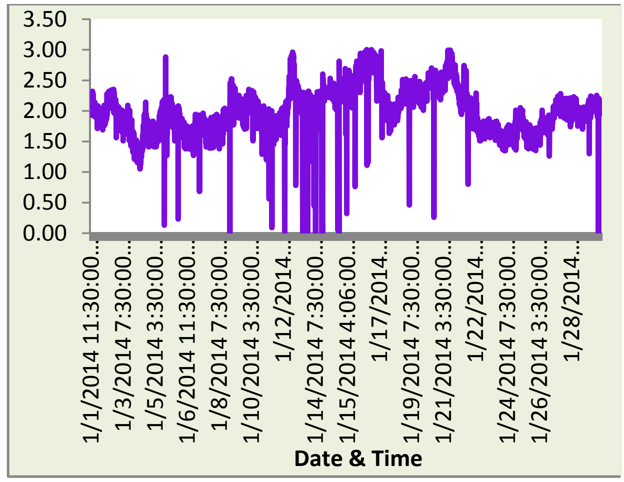


Figure 5.7: Real time value of BOD (mg/1) in River Yamuna at Wazirabad water works

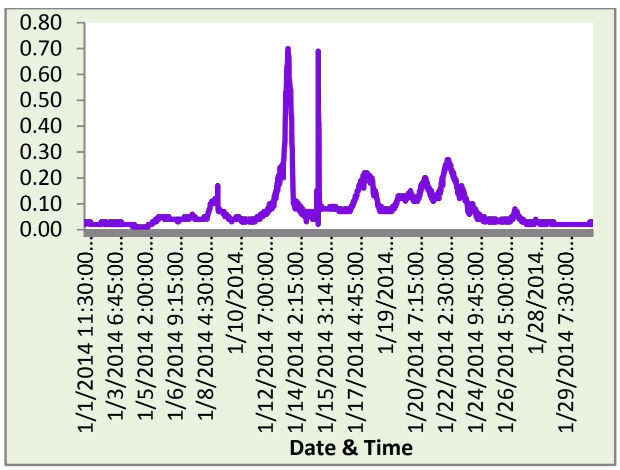


Figure 5.8 : Real time value of NH4-N (mg/1) in River Yamuna at Wazirabad water

5.1.4 Water quality Trends in River Yamuna-Delhi stretch

Central Pollution Control Board is regularly monitoring water quality of River Yamuna, with respect to desired water quality of Primary Water Quality Criteria. The monitoring is conducted at regular intervals at Palla, Nizamuddin Bridge and Okhla in Delhi stretch of River Yamuna. Delhi stretch of River Yamuna at Palla, used as drinking water source after conventional treatment, demands Class 'C' water quality with respect to pH, Dissolved Oxygen, Bio-chemical Oxygen Demand and Total Coliform levels. At Nizamuddin and Okhla, Kalindi Kunj, the water quality of River Yamuna is subjected to Propagation of wild life and fisheries use which demands Class'D' water quality with respect to pH, Dissolved Oxygen and Free Ammonia. Furthher, at Okhla downstream, River Yamuna is designated for the bathing use which demands Class'B'water quality with respect to pH, Dissolved Oxygen, Bio-chemical Oxygen demand and Total Coliform. The water quality trend during Year 2009 to Year 2013, in compliance to desired levels of water quality, is depicted in Figures 5.9 to 5.19.

pH : Water quality trends indicate that pH is always meeting the desired standard of 6.0 to 9.0 at Palla, 6.5 to 9.5 at Nizamuddin Bridge and Okhla, Kalindi Kunj, 6.5 to 8.5 at Okhla, downstream.

Dissolved Oxygen: Water quality trends indicates that Dissolved Oxygen level always meet the desired quality standard of 4.0 mg/l at Palla. The levels of Dissolved Oxygen at Nizamuddin Bridge meet the desired criteria of 4.0 mg/l during Year 2010, 2011 and 2012 in water quality of River Yamuna. The Dissolved Oxygen lavels always exceeded the desired criteria of 4.0 mg/l in water quality of River Yamuna at Okhla, Kalindi Kunj. During 2012 and 2013 the in maximum levels of Dissolved Oxygen, were within the desired standard of 5.0 mg/l at Okhla downstream.

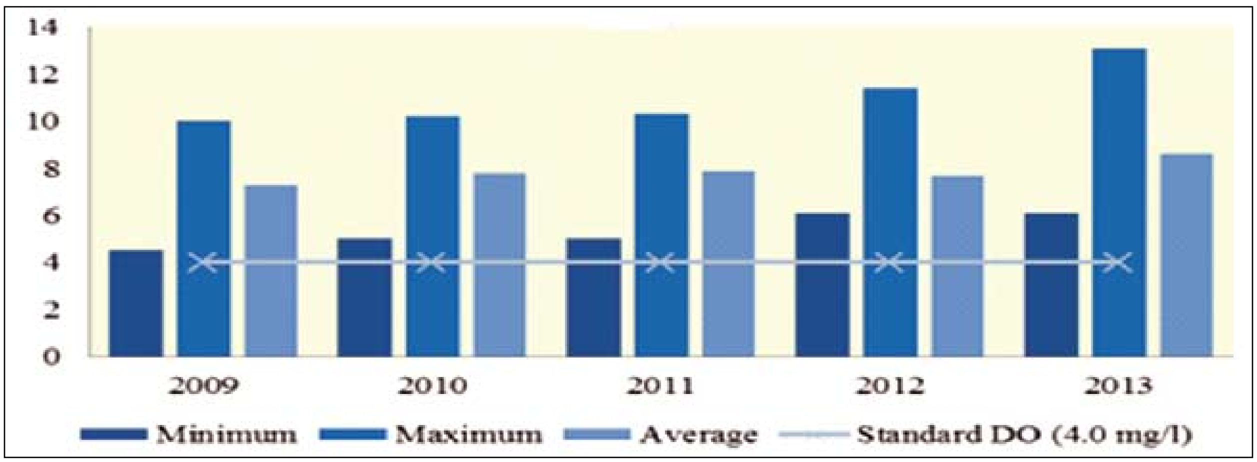


Figure 5.9 : Dissolved Oxygen levels (mg/1) at Palla

Figure 5.10 : Dissolved Oxygen levels (mg/1) at Nizamuddin

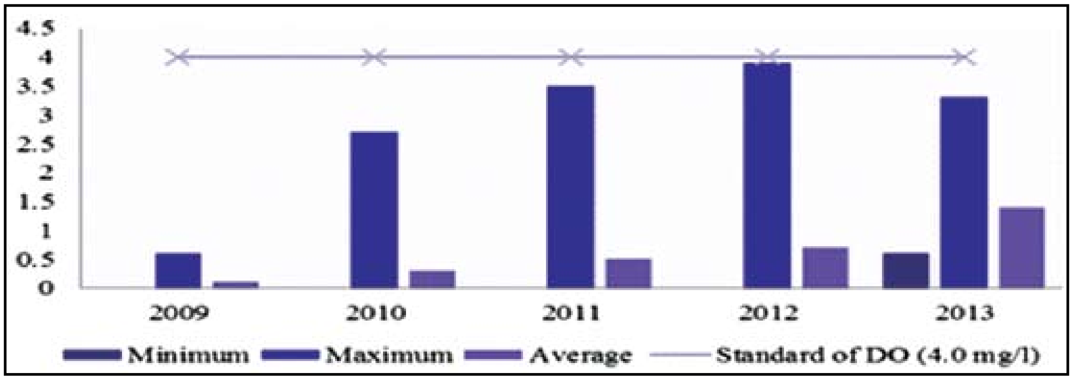


Figure 5.11 : Dissolved Oxygen levels (mg/1) at Okhla, Kalindi Kunj

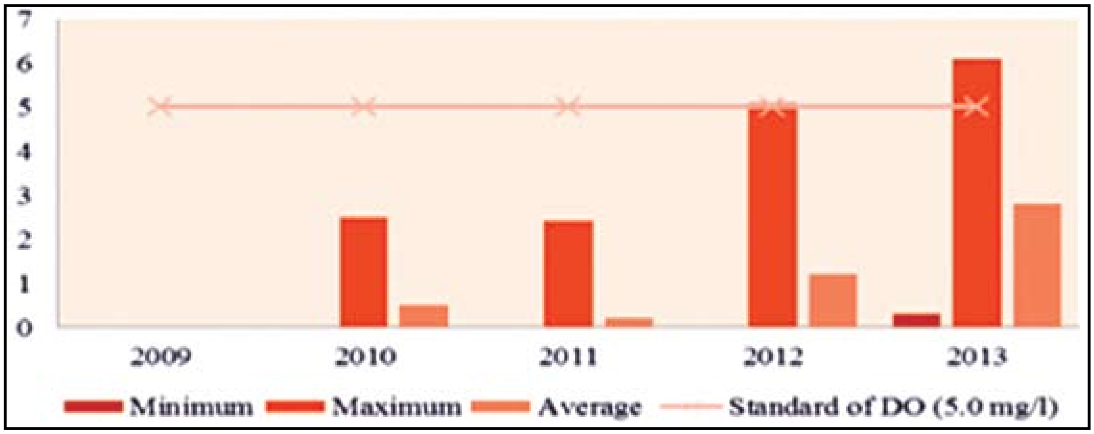


Figure 5.12 : Dissolved Oxygen levels (mg/l) at Okhla downstream

Bio-chemical Oxygen Demand: Water quality trends indicate that the maximum levels of BOD always exceeded the prescribed standards of 3.0 mg/l in water quality of River Yamuna at Palla. The minimum levels of BOD at Okhala downstream were within the desired level of 3.0 mg/l, during 2010 and 2013.

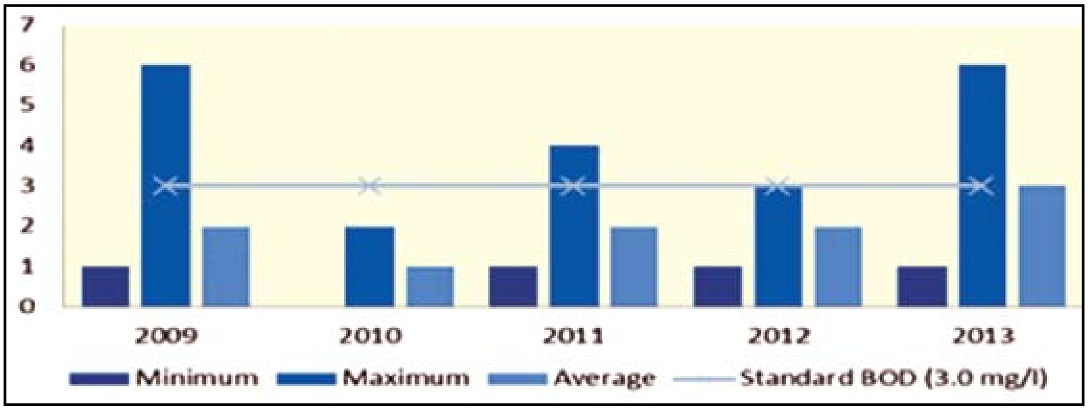


Figure 5.13 : Bio-chemical Oxygen Demand levels (mg/1) at Palla

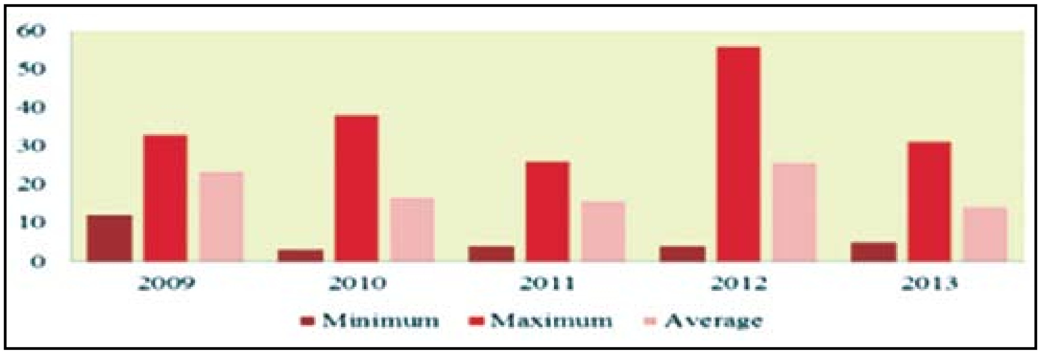


Figure 5.14 : Bio-chemical Oxygen Demand levels (mg/l) at Nizamuddin

Figure 5.15 : Bio-chemical Oxygen Demand (mg/l) at Okhla, Kalindi Kunj

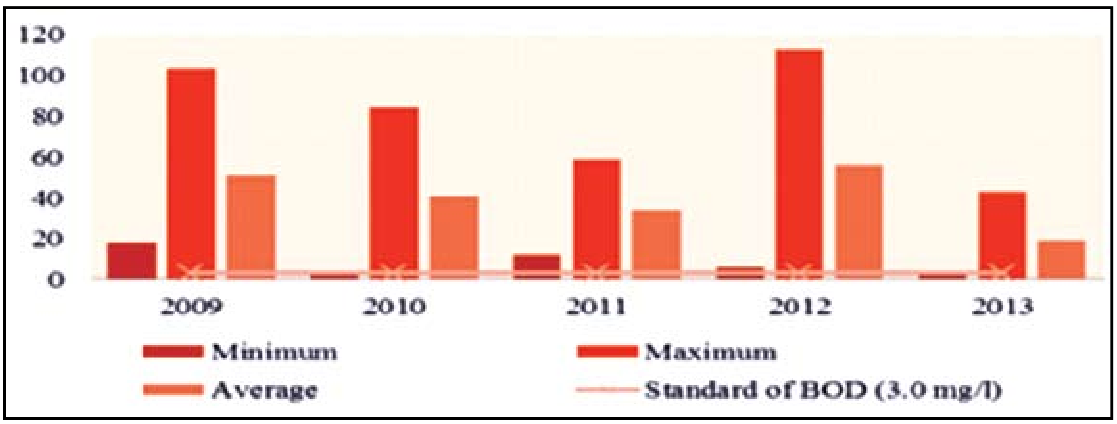


Figure 5.16 : Bio-chemical Oxygen Demand levels (mg/l) at Okhla downstream

Total Coliform & Faecal Coliform: The water quality trends indicates that the maximum, minimum and average levels of Total Coliform during 2010 at Palla were within the desired criteria of 5000MPN/100ml and maximum level of Total Coliform was observed during Year 2012. The Total Copper lavels at Okhla downstream always exceeded the desired criteria of Total Coliform levels of 500MPN/100ml. Maximum faecal coliform contamination was observed at all monitored locations

Palla, Nizamuddin, Okhla, Kalindi Kunj and Okhla D/s during the year 2012. Presence of faecal colifom in river water indicate contamination of rive water from domestic sewage.

Free Ammonia: Free Ammonia in River Yamuna water at Nizamuddin always exceeded the desired criteria of 1.2 mg/l whereas, minimum levels of Free ammonia at Okhla, Kalindi Kunj were within the desired criteria of 1.2 mg/l, during year 2011, 2012 and 2013 (Figures 5.17 to 5.19).

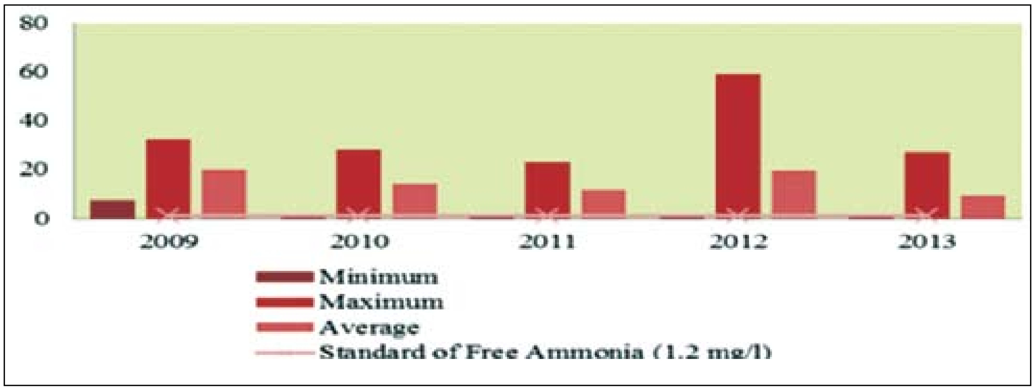


Figure 5.17 : Free Ammonia (mg/1) at Nizamuddin

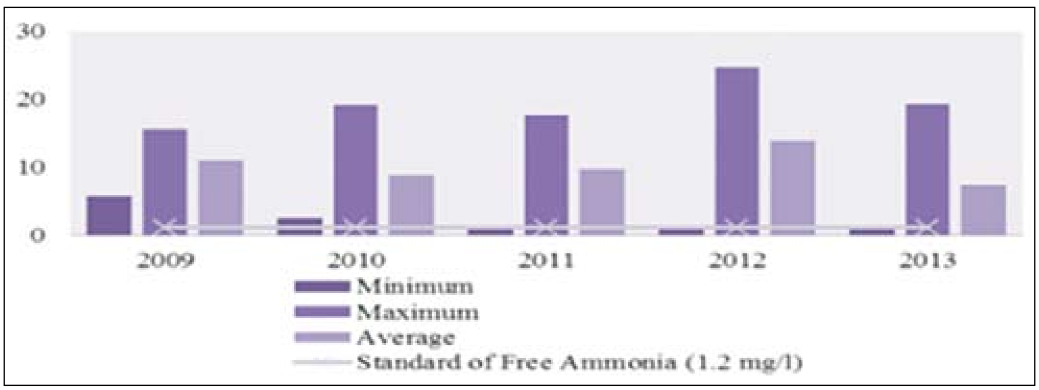


Figure 5.18 : Free Ammonia (mg/1) at Okhla, Kalindi Kunj

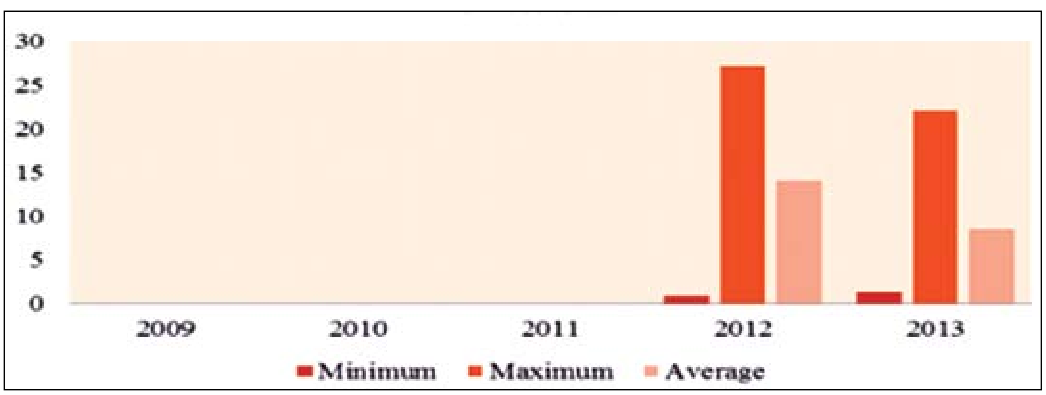


Figure 5.19 : Free Ammonia (mg/1) at Okhla downstream

5.1.5 Pathogens in water quality of drains joining River Yamuna in Delhi stretch

Central Pollution Control Board is regularly monitoring 18 drains joining River Yamuna in Delhi stretch for Physico-chemical and Microbiological parameters in compliance of the Hon'ble Supreme Court's direction. Attempts have been made to evaluate contribution of pathogenic bacteria in terms of Total Coliform, Faecal Coliform and *E.coli* contributed by the drains to River Yamuna. Magazine road drain contributed maximum number of Total coliform to water quality of River Yamuna followed by Sen Nursing Home drain, Maharani Bagh drain. Sen Nurssing Home drain contributed maximum number of *E.coli* to River Yamuna in Delhi stretch (Figure 5.20).

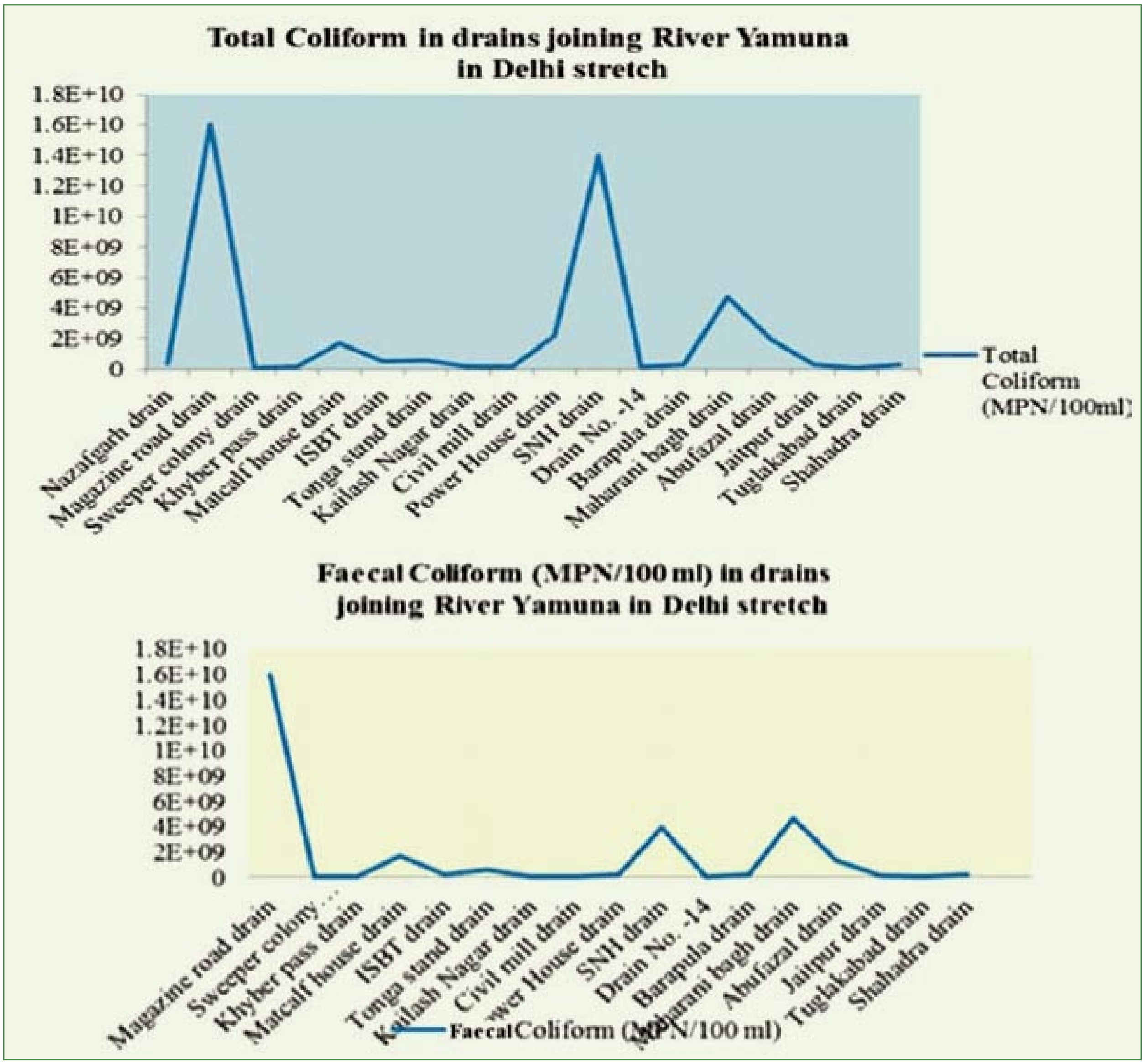


Figure 5.20 : Total Colifom, Faecal Coliform and E-coli in drains Joining River Yamuna in Delhi Stretch

5.1.6 Water quality monitoring of River Ganga and its tributaries

Monitoring of water quality of river Kali, Ramganga, Ganga, Gomti, Varuna and their major tributaries was carried out during the year at following specific locations:

- River Ramganga b/c of River Ganga, near Farukhabad
- River Kali b/c of River Ganga, near Kannuj
- River Ganga near Bithoor
- River Ganga at Kanpur
- River Ganga at Uchaahar (Raibaereli)
- River Ganga u/s Allahabad
- River Yamuna b/c with River Ganga
- Bathing Ghat at Sangam
- River Ganga d/s Allahabad ¼ width
- River Ganga d/s Allahabad ½ width
- River Tons b/c with River Ganga
- River Ganga at Pakka Ghat Vindhyachal
- River Ganga u/s Varanasi
- River Ganga at Dashashwamegh Ghat
- River Ganga near Malviya Bridge at Varanasi
- River Varuna b/c with River Ganga
- River Ganga d/s Varanasi ¼ width
- River Ganga d/s Varanasi ½ width
- River Gomti b/c with River Ganga
- River Ganga at Tarighat

The entire stretch of river Ganga from Haridwar to Tarighat has been designated as conforming esignated-Best-Use class 'B' with reference to designated best use classification (CPCB), which implies that water quality should be fit for bathing, swimming, water sports etc. The status of water quality is presented below:

a. Dissolved Oxygen (D.O.) observed in the entire stretch of river Ganga was more than 5 mg/l i.e. well within the limit to conform the water quality as class 'B' except for river Varuna and river Kali where the D.O. concentration was found below 5 mg/l.

b. River Kali corrtes industrial discharges and meets river Ganga near Kannauj and impart adverse impact on the water quality of recipient water body.

c. Water quality of river Ganga at Kanpur gets affected due to discharges of various urban drains & tanneries.

d. During Magh-Mela, most commission of the drains flowing from Allahabad were tapped and newly installed STPs. Thereby significantly reducing the pollution load discharge and showing remarkable improvement in water quality of river Ganga during the Mela period particularly at Sangam, Allahabad.

e. The river Varuna at Varanasi carries the excess effluent of Dinapur STP and few minor drains of Varanasi and meet river Ganga downstream of Varanasi. The river was found tapped before its confluence with River Ganga.

f. In terms of BOD, the stretch of river does not conform to the designated best use 'B' class

5.1.8 National Ganga River Basin (NGRB) Program

Central Pollution Control Board has been entrusted with the responsibility of exeating the following three projects sunder NGRB program.

i. Pollution Inventorization, Assessment & Surveillance on River Ganga (PIAS)

ii. Water Quality Monitoring System for River Ganga (WQM)

iii. Strengthening of Environmental Regulators-CPCB (SER)

i. Pollution Inventorization, Assessment & Surveillance on River Ganga (PIAS)

The Project "Pollution, Inventorization, Assessment & Surveillance on River Ganga (PIAS)" is funded by the Ministry of Environment & Forests and Rs. 34.77 crore was sanctioned for Project in March, 2011. The objective of the project is to inventorize the pollution sources (both point and non-point) and to assess the pollution load being discharged into the River Ganga directly or indirectly through its tributaries, namely Ramganga and Kali-East.

The project involves in-depth monitoring of Grossly Polluting Industries (GPI) (on yearly basis), Sewage Treatment Plants (STP) (on half yearly basis), Common Effluent Treatment Plant (CETP) (on quarterly basis) and Polluted Stretches of River Ganga and its tributaries Ramganga and Kali-East, besides monitoring of the drains discharging directly into the river or its tributaries.

During the year Central Pollution Cantrol Board inspected 304 out of 764 GPIs operating in five Ganga basin States. The summary status of the industries monitored is presented in table 5.21. Out of 304 industries monitored, 34 industries were found non-compliant, violating the preserebed effluent standards therefore, directions under Section 5 of the Environment (Protection) Act, 1986 when issued to these 34 industies where as letters for ensuring compliance were used in case of 21 industries.

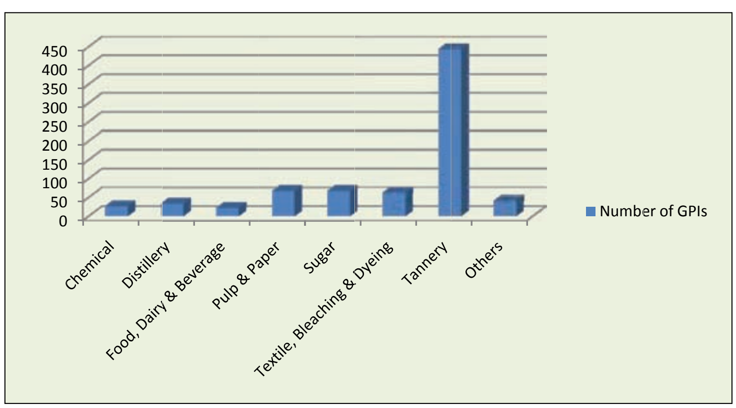


Figure 5.21 : Sector-wise distribution of industrial units in Uttar Pradesh, Uttrakhand, Bihar & West Bengal

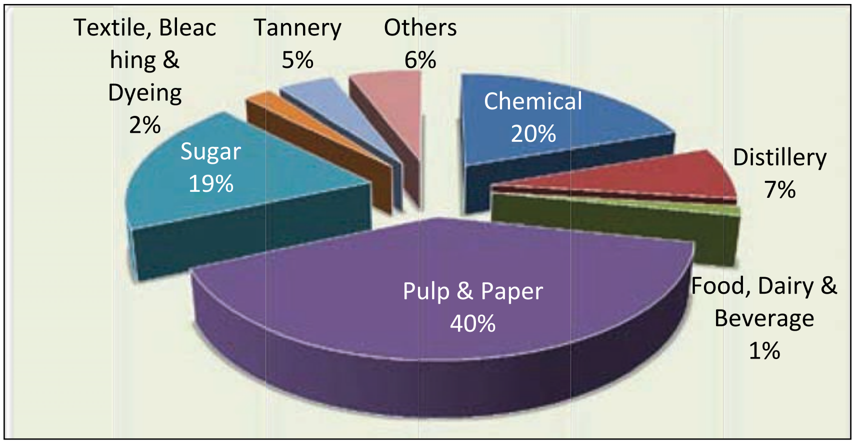


Figure 5.22: Sector-wise waste contribution water generation five Ganga basin states

CPCB also conducted performance evaluation of 51 STPs installed in the Ganga basin states. The study reveals that out of the 51 STPs evaluated 26 STPs are operating satisfactorily and conforming to the discharge standards, where as 15 STPs were not in operation and 10 STPs not conforming to the discharge standards in terms of BOD or COD. The summary status about performance of STPs is presented in table 5.22. Inventorization of 157 dreins discharging waste water into the River Ganga was conducted and 62 major drains monitored for assessment of pollution load. Ground water quality monitoring was carried out at 66 monitring locations in 7 districts.

ii. Water Quality Monitoring System for River Ganga (WQM)

This World Bank funded project was sanctioned on 19th July 2013 with finoreicl artley of Rs. 94.45 crores. Under the project Real Time Water Quality Monitoring network of 113 stations is proposed to be established. The network would be developed on data purchase concept where monitoring system will be installed, commissioned and operated by vendors and CPCB would purchase data of water quality. The data are required to be validated so as to qualify for payment on periodic basis. The network is expected to analyze 20 parameters related to water quality. A Vendor's meet was held on 2nd September, 2013 to discuss the experience of various vendors in Real Time Water Quality Monitoring (RTWQM) which was attended by 36 vendors / agencies. 19 sites including 8 in Uttarakhand, 3 in Uttar Pradesh and 8 in West Bengal have been finalized for installation of RTWQM stations.

The project involves bio-monitoring at all 113 locations besides on line monetoring of 20 physico chemical parameters. The biomonitoring protocol developed by CPCB shall be followed. The projects also envisages the concept of community monitoring, to be carried out with the involvement of the organizations, institutions, schools, colleges and universities and other reputed activists.

iii. Strengthening of Environmental Regulators – CPCB (SER)

The World Bank assisted project for Institutional Development with funcanal artley of Rs. 69.26 crores was sanctioned in July 2013. The project involves manual water quality monitoring of River Ganga by amalgamating the CPCB and NRCD network of manual water quality monitoring making a total of 134 stations. The project supports enhanced frequency of manulating and additional parameters of monitoring of water quality at all 134 locations. The project also supports renovation and development of bio-lab and instrumentation lab at CPCB Head Office, Delhi and infrastructure development of Zonal Office, Lucknow and Kolkata. To develop the laboratories at Delhi, Lucknow and Kolkata. Procurements of instruments estimating Rs. 14.00 lakh have been finalized. A comprehensive report on “Assessment of Pollution Load : River Ganga” has been prepared incorporating the information on industrial effluent, domestic sewage, pollution load from drains, ground water quality status covering the main stream of River Ganga and its major tributaries Ramganga and Kali-East.

Table 5.5: Sectorwise breakup of 764 grossly polluting industries

Industry	Nos.	Water consumption (MLD)	Waste water generation (MLD)
Chemical	27	210.9	97.8
Distillery	33	78.8	37
Food, Dairy & Beverage	22	11.2	6.5
Pulp & Paper	67	306.3	201.4
Sugar	67	304.8	96
Textile, Bleaching & Dyeing	63	14.06	11.42
Tannery	444	28.7	22.1
Others	41	168.3	28.6
TOTAL	**764**	**1123.06**	**500.82**

Table 5.6 : Status of grossly polluting industries (GPIs) inspected

Action/State	Total
Direction under section 5 of environment (Protection) Act, 1986	34
Letters issued for ensuring compliance	21
No action required	72
Action taken for reinspection/revalidation	38
Found closed	70
Action under process	32
Inspection report under preparation	37
Total	**304**

Table 5.7 : Performance evaluation of STPs in Ganga basin states

States	No. of STPs	Installed Capacity (MLD)	Utilized Capacity (MLD)	No. of STPs Not In Operation	STPs Exceeding BOD Limits	STPs Exceeding COD Limits
Uttar Pradesh	8	358	287	1	4	0
Uttarakhand	4	54	-	0	1	1
West Bengal	34	457	214	13	3	0
Bihar	5	158	100	1	1	0
Total	**51**	**1027**	**601**	**15**	**9**	**1**

NGRB Project Activities at CPCB Zonal Office Lucknow

A) Inspection of Grossly Polluting Industries:

278 Grossly Polluting industries in 07 districts of U.P., were inspected, out of which 49 were tound complying with the norms, 66 were non-complying, 59 have been closed by their own reason and 28 Industries were found not in operation. 20 industries are involved in dry process work and 19 industries were not traceable during the inspection, besides this 08 industries were involved in production of different products and they did not share any information about their industry. Based on the inspection, Directions under section 5 of E (P) Act 1986 were issued to 29 units for ensuring compliance, 18 industries were re-inspected for compliance verification. The compliance verification and Inventorisation focused mainly on tanneries and allied industries located in Kanpur & Unnao during the year.

B) Performance evaluation of Common Effluent Treatment Plants (CETP):

The 'USAB' based 'CETP' at Kanpur has an inflow capacity of 36 MLD with tannery effluent to sewage (T: S) blending ratio is 1:3 i.e. 9 MLD tannery effluent and 27 MLD sewage. The domestic wastewater is being collected in sump well, from where the required quantity is pumped into 'CETP' for treatment.

The removal of suspended solids at CETP has been found satisfectry (83.03% Removal) but the UASB system was not found removing BOD load upto desirable level (Removal only 36.44%). The concentration of oil & grease (55.5 mg/l) and BOD (150 mg/l) in the CETP discharge exceeds the prescribed standards of 10 mg/l & 100 mg/l respectively.

C) Performance evaluation of Sewage Treatment Plants.

During monitoring of STPs 4 Hourly-24 Hrs composite samples were collected to evaluate sector-specific performance and overall efficiency of treatment. It was observed that in most of the cases hydraulic capacity of the STPs is either under-utilized or is excessively exhausted. Performance in terms of BOD reduction at STPs monitored is presented in Figure 5.22

The compliance of norms was recorded at 6 STPs, while three STPs i.e. Salari Allahabad, Kanpur (130 MLD) and Kanpur (5 MLD) were found non complying.

D) Monitoring of ground water quality

Groundwater monitoring was conducted at identified locations in Unnao district. Total 26 ground water samples were collected from Police line training centre, Unnao, Ghazipur, Varanasi, Raibareli and Shajahanpur. It was observed that the overall groundwater quality is not satisfactory with respect to electrical conductivity, TDS, total hardness, magnesium, turbidity and total hardness.

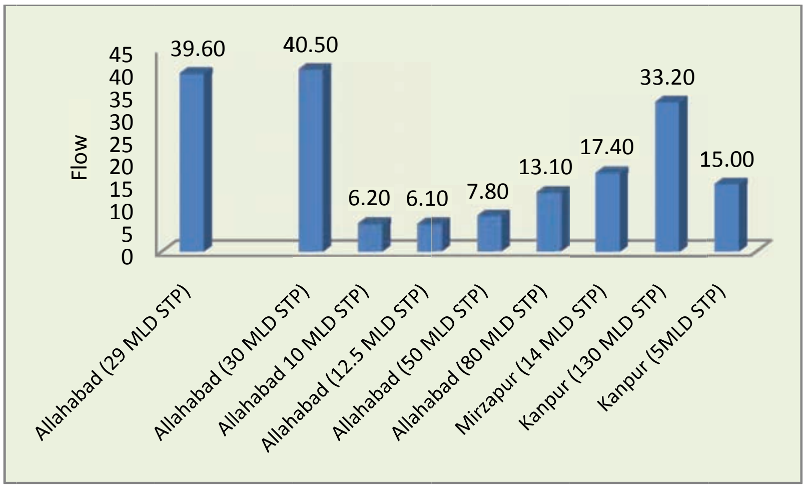


Figure 5.23 : Performance of STPs in terms of Performance Reduction in BOD

E) Drain Monitoring and Assessment of pollution load.

Total 40 drains were monitored in 11 districts of Uttar Pradesh. Municipal waste water discharge from different drains reveal significant variation in quality and quantity. The parameters SS, BOD, and COD were found exceeding. The prescribed limits in most drains while Ammonical nitrogen, Phosphate exceeded the norms in few drains. Pollution load discharged to river Ganga with respect to BOD was assessed and is presented in table 5.23.

Table 5.8 : City/ District wise Pollution load discharged into river Ganga and its Tributaries through drains

Sl. No.	City/ District	Month of monitoring	Waste water Flow (MLD)	BOD Load TPD	COD Load TPD	TSS Load TPD
1	Aligarh	April 2013	194	170.63	406.92	334.96
2	Kannauj	April 2013	16	0.52	1.53	1.94
3	Kasganj	April 2013	10.83	0.94	2.16	1.49
4	Bareilly	May 2013	77	4.61	10.61	10.16

Sl. No.	City/ District	Month of monitoring	Waste water Flow (MLD)	BOD Load TPD	COD Load TPD	TSS Load TPD
5	Raibareli	May 2013	142.55	2.75	0.37	5.83
6	Unnao	June 2013	85.8	34.00	73.00	30.00
7	Kanpur	July 2013	436.53	37.48	96.57	85.86
8	Allahabad	June 2013	126.5	4.56	12.61	31.13
9	Mirzapur	June 2013	121.2	8.54	25.47	57.28
10	Varanasi	June 2013	986.6	61.59	134.24	155.24

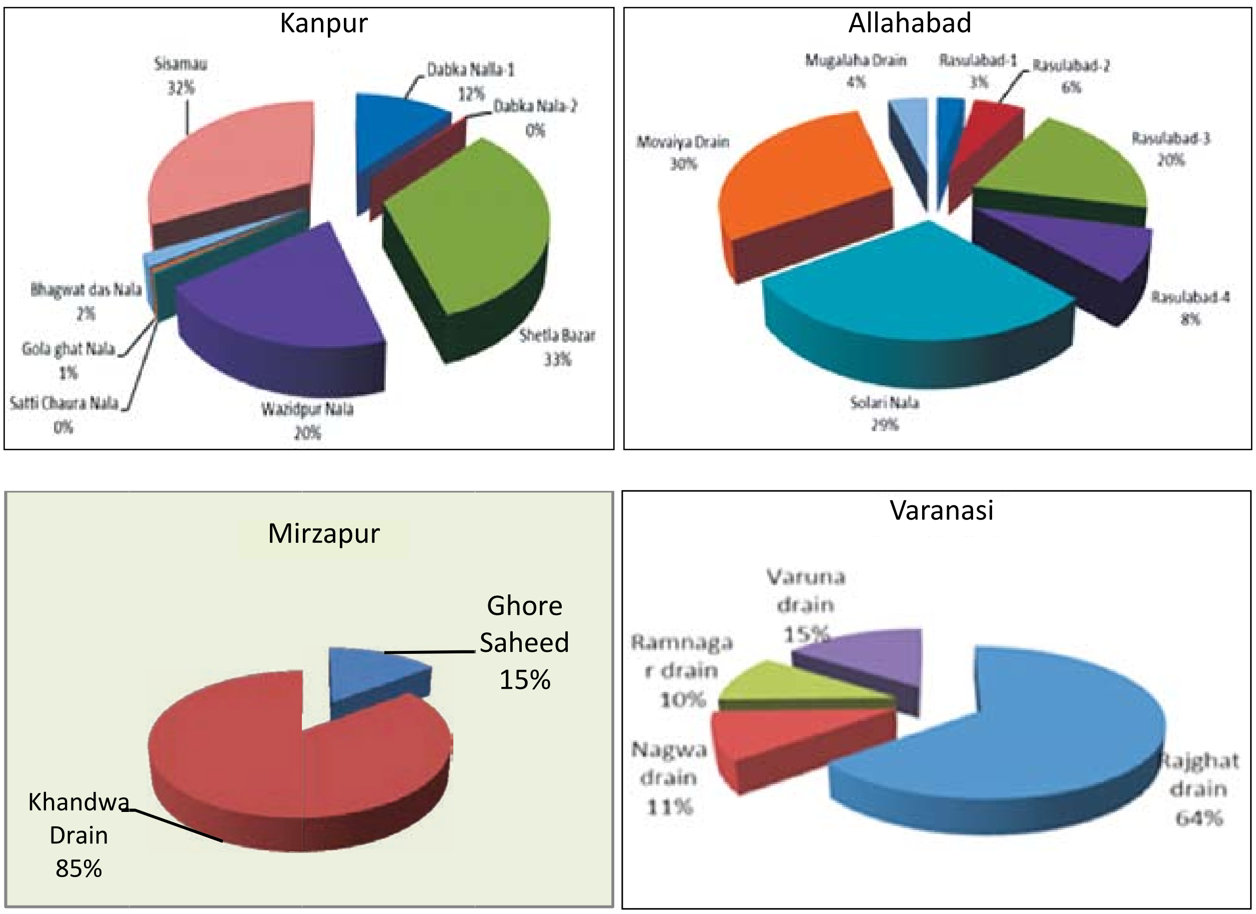


Figure 5.24: Pollution Load (in terms of BOD) contributed by various Drains to river Ganga in selected cities

NGRB Project Activities at CPCB Zonal Office, Kolkata

a) Inspection of Grossly Polluting Industries (GPI)

26 Grossly Polluting industries in West Bengal and 8 Grossly Polluting industries in Bihar were inspected by CPCB Zonal office-Kolkata. Out of the eight industries inspected in Bihar two industries were closed. The major industries inspected in West Bengal were Exide and United phosphorous.

b) Performance evaluation of Sewage Treatment Plants (STPs)

Performance evaluation of STPs has been undertaken at Twenty two STPs in West Bengal out of which, nine are low cost oxidation pond, five based on activated sludge process, four waste stabilization ponds, three trickling filters and one aerated lagoon. The percentage reduction in BOD varies between 40-75 % and COD between 50-83%. Not much improvement in infrastructure or operational status of STPs was observed.

c) Intensive Water Quality Monitoring in Polluted Stretches

Intensive water quality monitoring at 14 locations has been carried out in West Bengal region. The BOD level at Ichapur (13.5 mg/l), Gardenreach (10.8mg/l), Shyamnagar (11 mg/l) Nurpur (8.1 mg/l) and Diamond Harbour (7.7 mg/l) were observed. The faecal coliform count was also found high at all locations with maximum coliform count at Khardah ($16x10^4$ MPN/100ml). Based on the intensive water quality monitoring the stretch of River Ganga in West Bengal may be categorized as Designated-Best-Use class 'C'.

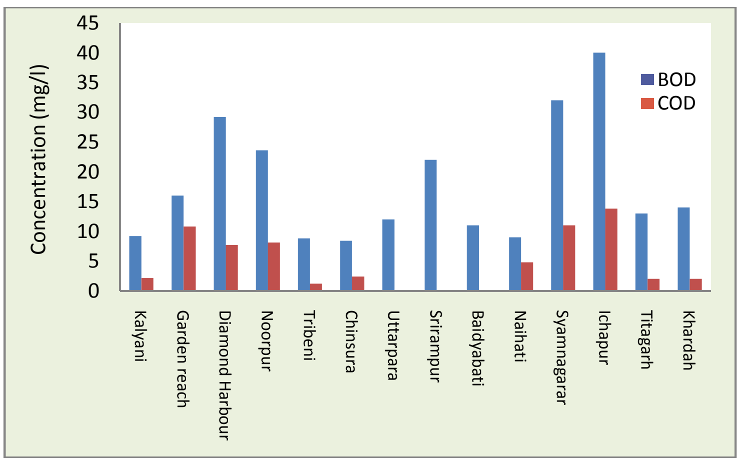


Figure 5.25 : BOD and COD levels of River Ganga

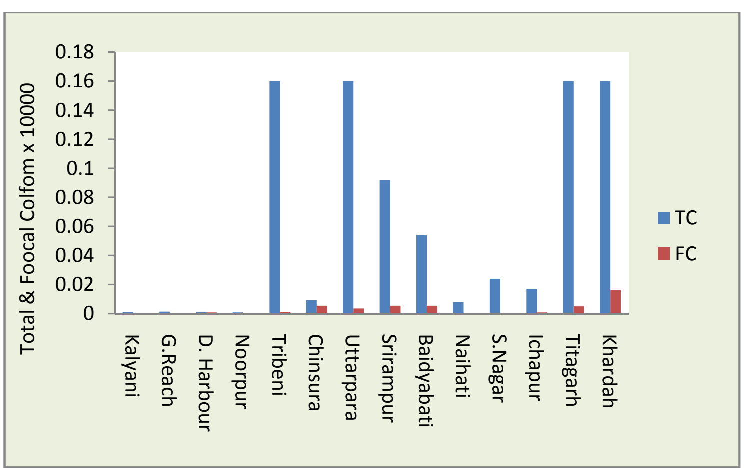


Figure 5.26 : Total and Faecal Coliform counts

d. Periodic Pollution assessment of major drains joining river Ganga

Central Pollution Control Board Zonal office - Kolkata has identified 39 major drains in West Bengal falling into river Ganga contributing towards deterioration in river water quality.

Thirty seven major drains in West Bengal were monitored with consideration of Tidal effect and samples were taken during low tide to have actual hydrallic conditions. The monitoring results indicate that in West Bengal 41% of the BOD load is contributed by Tolly Nullah followed by Chitpur (10%), Najergunj Khal (6.2%) and Kharda municipal drain (6%). Total BOD load contribution from drains is estimated as 138366 kg day. The total dissolved solids level at Shibpur burning Ghats was the highest among all the drains (1273mg/l). Sources contributing to these drains are surface runoff from urban areas and discharge of untreated waste water. BOD to COD ratio, as observed for three major drains i.e. Tolly Nalla, Kharda municipal drain and Chitpur khal was 0.21, 0.27, and 0.33 respectively.

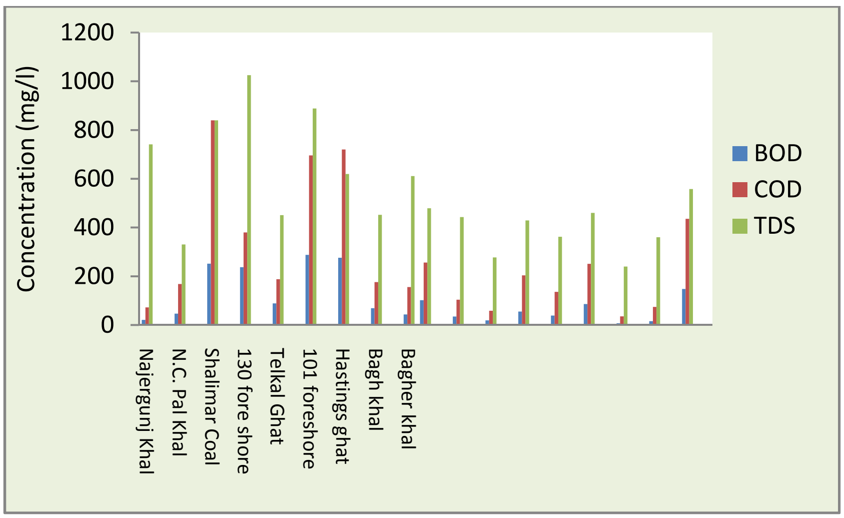


Figure 5.27 : BOD, COD and TDS in Drain water of major Drains joining River Ganga in West Bengal

e) Monitonig of Groundwater in Catchment zone of river Ganga

The ground water quality in various districts of West Bengal state was assessed vis-a-vis BIS drinking water standards. The ground water monitoring was undertaken at Howrah, Hugli, Nadia, South-24 Paraganas and North-24 Paraganas from 51 monitoring stations. Water hardness was observed high at most locations while, sulphate concentration was within safe limit. The utmost concern was the presence of Coliform both in tube well and dugwell. pH was well within the acceptable limit but TDS values exceeded the standard in all districts. Impact of garbage dumping was observed at many monitoring locations.

f) Real Time Water Quality Monitoring Stations (RTWQMS) at River Ganga

Central Pollution Contol Board has identified 35 locations for installation of RTWQHS on Ganga in association with West Bangal State Pollution Control Board and Bihar State Polution Contro Board and categorized these as Base lines stations (3 nos), trend station (16 nos) and Impact stations (16 nos). A joint visit of 26 monitoring sites in West Bengal was undertaken during February and March, 2014 by officials from CPCB Delhi, WBPCB and CPCB, ZO Kolkata for assessing site characteristics, feasibility of installation of monitoring station and obtaining permission from associated authorities with power connection, safety cum technical aspects.

Survellance of monitoring stations under National Water Quality monitoring Programme (NWQMP)

During the year survellance of monitoring stations under NWMP have been undertaken in states of Bihar, Odisha, Jharkhand and West Bengal.

State	No of NWMP Stations in Operation	Sureillance Target NWMP NOs	NOs of NWMP	Percent Completion
Bihar	136	34	13	38%
Odisha	93	24	10	42%
Jharkhand	35	09	08	90%
West Bengal	97	24	17	71%

5.1.8 Monitoring of Inter-State Rivers

5.1.8.1 Northen Zone

Monitoring of major rivers viz. Sutlej, Beas, Sone, Betwa, Ramganga, and Ganga was conducted on quarterly basis at Inter-State boundaries of Himachal Pradesh, Punjab, U.P., M.P. and Bihar. Water Samples were collected from identified river locations (Table 5.9) and analyzed for various water quality parameters as per the monitoring protocol notified by MoEF. Two drains i.e. Golthai (H.P.) and Sohana (H.P.) meeting river Satlej and Beas respectively in Punjab were also monitored quarterly. Low DO levels and high BOD concentration was recorded at Sohana drain (H.P.) meeting River Beas.

Table 5.9 : River locations, monitoring frequency interstate Rivers in Northern Zone

S.N	River / drain	Latitude/ Longitude	Sampling Location	Frequency	Water quality Class observed
1.	Ganga	N 25°35'14.0"/ E 083°36'19.3"	Tarighat, Ghazipur (U.P.)	Quarterly	* Class 'C'
		N 24°32'29.4"/ E 083°59'13.1"	Majhighat, Chappra (Bihar)	Quarterly	Class 'B'

S.N	River / drain	Latitude/ Longitude	Sampling Location	Frequency	Water quality Class observed
2.	Betwa	N 24°23'57.5"/ E 78°10'41.4"	Kanjia Bridge, (12 km from Mongoli village towards M.P)	-do-	-do-
		N 25°11'33.4"/ E 78°32'32.3"	D/S Dukana Dam near Talbehat, U.P.	-do-	-do-
4.	Sone	N 31°56'50.1"/ E 075°53'33.6"	Chopan village (U.P.)	-do-	-do-
		N31°56'50.1"/ E075°53'33.6"	Rihand Dam, Deora (M.P.)	-do-	-do-
6.	Sutlej	N 31°22'34.2"/ E 076°21'52.7"	Nangal (Punjab)	-do-	-do-
		N 31°08'42.6"/ E 082°05'17.8"	Olinda (H.P)	-do-	Class 'A 'except Coliforms
10.	Beas	N 31°56'49.8"/ E 75°53'33.5"	Babe Ki Kuttiya at Talwada (Punjab)	-do-	Class 'A 'except Coliforms
		N 31°57'54.4"/ E 075°54'37.9"	H.P. (Shah Barrage towards Pong dam)	-do-	Class 'C "

Faecal Coliform MPN/ 100 ml - < 50, Class 'A' water. (Suitable for drinking)
< 500, Class 'B' (Suitable for Bathing)
**< 5000, Class 'C' (suitable for Agriculture)*

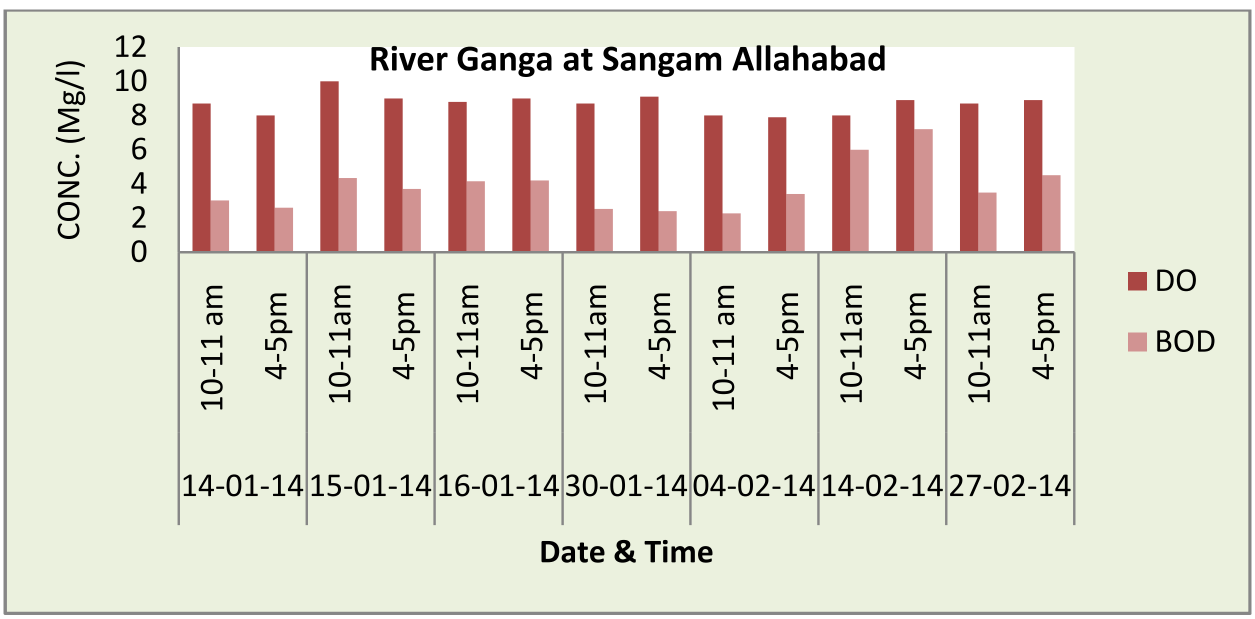


Figure 5.28 : Values of DO and BOD on auspicious Mass bathing days during Magh Mela- 2014

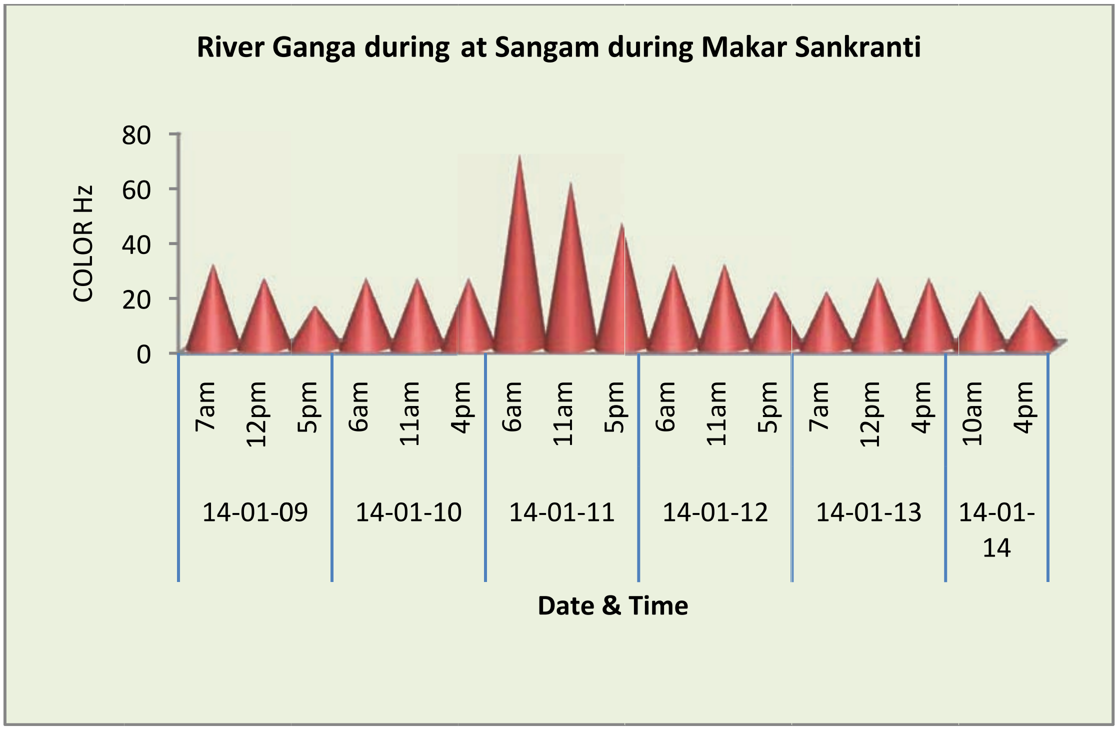


Figure 5.29: Trend of Colour intensity of River water of Ganga during Makar Sankranti (Magh Mela) during 2014

River Ganga at Sangam during Makar Sankranti

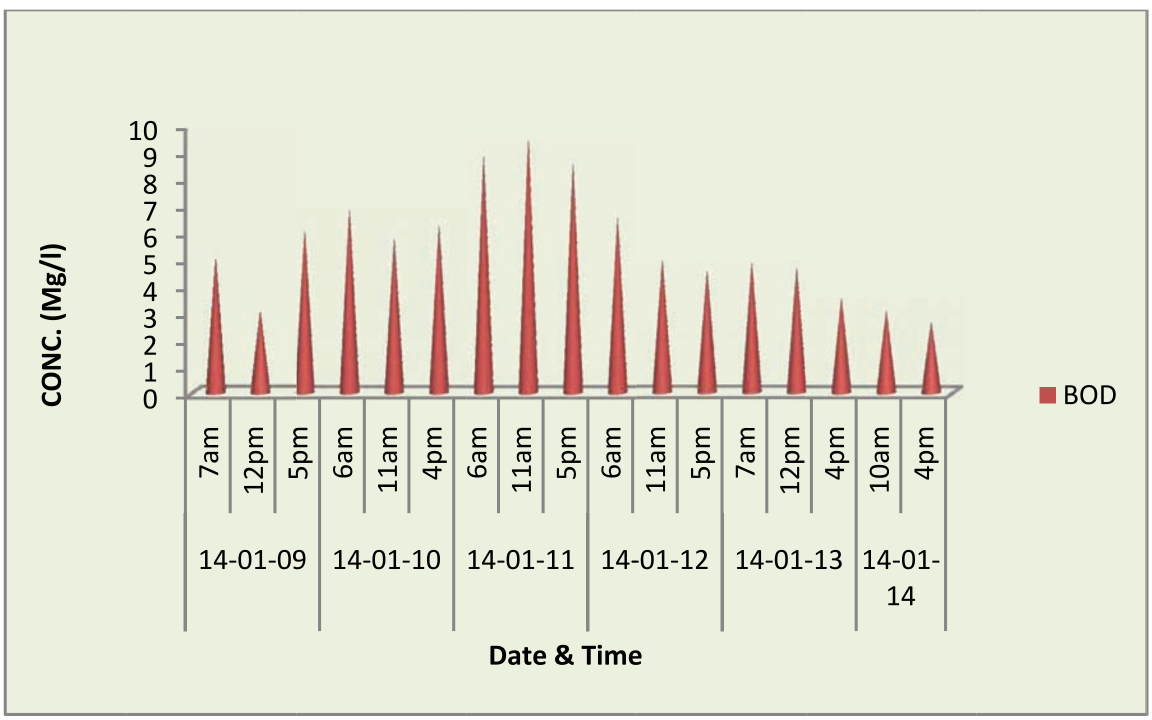


Figure 5.30 : Trend of Biochemical Oxygen Demand (BOD) of River Water in Ganga on Makar Sankranti (Magh Mela) during 2014

5.1.8.2 Western Zone

Total 14 River Water Quality Monitoring sites have been identified on various rivers at the Inter-state boundaries of Gujarat, Maharashtra, Rajasthan, Madhya Pradesh and UT of Daman.

- Central Pollution Contol Board is conducting monitoring at 12 locations. At 10 locations the water samples are collected on yearly basis. At 02 locations on Daman Ganga river monitory is conducted an quarterly basis in view of inter-state issues. The water samples are analysed for various physico-chemical parameters and biological parameters to assess the water quality of the rivers at interstate boundaries.

Table 5.10 : Monitoring locations at interstate boundaries (after rationalization) at western Zone

Sl. No.	River	Sampling Locations
1	Mahi	Rajasthan - Gujarat Border, Kadana dam
2	Narmada	Navagam – Near Kevadia, MP Border
3	Sabarmati	Rajasthan – Gujarat Border, Kheroj bridge, Khedbrahma
4	Tapi	Madhya Pradesh – MP Maharashtra Border, Ajnad
		Maharashtra – Gujarat Border, Prakasha
		Maharashtra and Gujarat border at Nizhar
7	Bhima	Maharashtra – Karnataka border, Takli
8	Krishna	Maharashtra – Karnataka border, Kurundwad
9	Godawari	Maharshtra – Andhra –Karnataka border, Dharmadabad
10	Wainganga	Chattisgadh – MP – Maharashtra border, Bapera village
11	Damanganga	DNH – Gujarat border (U/S of CETP Vapi outlet)
		Gujarat – Daman border, near Jari causeway.

5.1.9 Monitoring of other rivers & rivulets in Gujarat

Central Pollution Control Board Zonal office – West, Monitored few rivulets/river having potential of contamination due to proximity with critically polluted areas of Ankleshwar & Vapi in Gujarat. The water quality at Amlakhadi, Ankleshwer (Ganga Chhaprakhadi, Bharuch (Gujarat) Billkhadi, Vapi (Gujarat) and river Kolak Vapi (Gujarat) are presesited in Table 5.11.

Table 5.11 : Water Quality Assessment of Rivers & Rivulets in Gujarat

- **Amlakhadi at NH-8, Ankleshwar (Gujarat)**

Mantaing Date	Parameters										
	pH	TSS	TDS	COD	BOD	NH_3-N	TKN	Phenols	S^{-2}	CN^-	O&G
19.06.2013	7.31	89	768	84	30.0	21.7	28.50	BDL	0.37	0.23	1.0
17.07.2013	7.34	34	729	61	9.3	2.6	3.1	0.16	--	--	--
05.09.2013	7.48	29	869	104	29	11.7	--	0.54	0.31	0.19	4.2
28.12.2013	7.27	92	1459	247	59	17	--	0.033	0.23	0.05	19.5
22.02.2014	6.23	45	520	80.0	25.5	6.59	--	0.057	0.20	--	0.27

- *All parameters except pH are expressed in mg/l.*

- **Chhaprakhadi near Narmada Golden bridge, Bharuch (Gujarat)**

Mantaing Date	Parameters										
	pH	TSS	TDS	COD	BOD	NH_3-N	TKN	Phenols	S^{-2}	CN^-	O&G
19.06.2013	7.59	35	1623	228	40.0	26.0	31.80	0.09	1.8	0.18	2.0
05.09.2013	7.59	29	938	92	6.5	2.1	--	1.9	0.23	0.17	1.8
28.12.2013	7.66	17	2456	67	10.0	13	--	0.279	0.48	0.09	2.4
22.02.2014	5.72	30	2979	142	11.4	21.95	--	0.049	0.14	0.22	--

- *All the parameters except pH are expressed in mg/l.*

- **Billkhadi at NH-8, Balitha, Vapi (Gujarat)**

Mantaing Date	Parameters										
	pH	TSS	TDS	COD	BOD	NH_3-N	TKN	Phenols	S^{-2}	CN^-	O&G
19.06.2013	7.28	36	1499	122	32.0	5.2	7.35	0.26	--	--	--
23.11.2013	7.56	25.7	760	110	42	11.8	--	0.82	6.4	BDL	3.3
03.12.2013	7.45	14.3	611	133	15.6	13.71	--	1.11	--	--	--
22.02.2014	6.74	24	565	100	25.0	13.99	--	0.251	1.40	0.104	2.7

- *All parameters except pH are expressed in mg/l.*

- **River Kolak, Balitha, Vapi (Gujarat)**

Sampling Locations	Parameters								
	Mauting Date	pH	TSS	TDS	D.O.	COD	BOD	NH_3-N	Phenols
River Kolak, u/s Near Railways Bridge at Vapi.	03.12.2013	8.41	3.4	255	8.4	11	1.4	0.10	0.58
River Kolak d/s Pataliya Bridge at Vapi.	03.12.2013	7.64	18.8	3921	1.9	81	12.2	0.13	1.06

- *All parameters except pH are expressed in mg/l.*

5.1.8.3 Eastern Zone

In Eastern Zone the seven interstate River locations on four major rivers namely - R. Damodar at Sindri and Disergarh (Jharkhand – West Bengal), R. Subarnarekha at Behragora (Jharkhand – Orissa), Gopiballabhpur (Orissa – West Bengal) and at Lakhannathpur (West Bengal – Orissa), R. Indrāvati at Nabrangpur (Chattisgarh – Orissa) and R. Mahanadi at Hirakud (Chattisgarh – Orissa), are monitored. River Churni is also monitored at international border of (u/s) Bangladesh and (d/s) India in West Bengal. The monitoring is undertaken thrice a year representing Summer (in last week of May), Post monsoon (last week of September) and Winter (last week of January).

The comparison of water quality data collected at 07 interstate locations during 2013-14 with that of last year indicate that the Total and Faecal Coliform count was high during the current year in comparison to previous year during all seasons. No trend can be established, but high values can be attributed to discharge of untreated sewage, mass bathing, open defecation, Surface runoff and Cattle bathing.

River Churni is most polluted among the five rivers.water Quality data indicate that while there is no abrupt changes or deviation from the normal tolerance limit in other rivers but bacteriological pollution remains throughout the year. To mitigate the present pollution problem sources of pollution need to be identified and suitable remedial measures required to be taken.

5.1.8.4 Southern Zone

Water quality monitoring of six major rivers namely River Godavari at Baser, River Tungabhadra at Hochcheli, River Krishna at Devdurga, River Bheema at Gangapur, River Manjari at Bidar and River thenpennai at Mugalur Bridge is conducted in Southern Zone and the action plans to prevent and control pollution recommended to concerned SPCBs.

5.1.8.5 Central Zone

In central Zone, water quality monitoring is conducted at four locations viz Mahi River at Village Bajna, District – Ratlam (MP), Mahi River at Gamon Bridge, District – Banswara (Raj.), Chambal River (Fish Farm), Rawatbhata, District – Kota (Raj.) and Vardha River Tehsil Pandhurna, District – Chhindwara (MP).

Sampling is carried out on quarterly basis and the analysis results indicats that BOD values are higher at Bajna, Mahi Bajaj Sagar Dam and Chambal Fish Farm respectively due to inflow of high organic waste in above water bodies during rains. The sampling undertaken after rainy season indicated normal BOD values.

5.1.9 Monitoring of Mandakini River

The Hon'ble National Green Tribunal, Bhopal passed an order on 08.04.2013 in the matter of application no. 9/13 Nityanand Mishra V/S State of M.P. & Others. In compliance of the Tribunals order, joint monitoring was conducted by team of CPCB and MPPCB afficios on River Mandakini on 21st April 2013. The water samples were collected from various locations on River Mandakini to assess the water quality.

"The water quality of river Mandakini confirms at class A to C as of Designated Best Use (DBU). Variation in water quality observed could be due to combined impact of mass bathing, discharge of waste water from houses located on river bank, obstruction in river flow at various places, animal activities in river and practice of open defecation on river side."

5.1.10 Monitoring during Magh Mela- 2014 in Allahabad

Maghmela is the annual social activity with organized Mass Bathing at Sangam, Allahabad. During the year 2014 Magh Mela was held between January 14th 2014 to Februay 27th2014. More than 3 crore people visited the Maghmela. Central Pollution

Control Board Zonal Office, Lucknow conducted an intensive monitoring to assess the quality of river Ganga and Yamuna during Magh Mala period at 10 identified locations between Farukhabad to Sangam Allahabad.

The water quality with specific reference to colour, Dissolved Oxygen (DO) and Biochemical Oxygen Demand (BOD) at Sangam at confluence of River Ganga and River Yamuna on the auspicious days during Magh Mela is presented in Fig 5.27 - 5.29.

- Water quality of river Ganga at Sangam, Allahabad during the Maghmela (Makarsankranti) showed improvement with respect to color and BOD in comparesion to earlier year. It indicates that the organic load in river Ganga has reduced, due to the abatement & control measures taken by the Government.

The improvement in water quality can be attributed to:

- Order of Hon'ble High Court of Allahabad for release of more than 2500 cusec water from Narora barrage to River Ganga from time to time during Magh Mela. The availability of consistent additional flow in the river has also been an another factor for improved water quality.
- Strict enforcement by CPCB and SPCBs to restrict industrial discharge into River Ganga had helped in qualitative improvement of water quality of the river.
- Before the Magh Mela period all the distilleries and tanneries in upper reaches of the river Ganga were directed to achieve zero discharge and restrict their operations for reduction in pollution load on river.
- Tapping of some of the drains discharging wastewater into river Ganga and diversion of sewage to newly installed STPs in Allahabad

5.1.11 SURVEILLANCE OF NATIONAL WATER QUALITY MONITORING PROGRAMME (NWMP) STATIONS

5.1.11.1 Gujarat & Maharsshtra

The monitoring stations for surveillance were selected and finalized on the basis of pollution load received by the receiving body from domestic, industrial and other man made activities, which affects the river water quality. There are 439 monitoring stations in west zone where monitoring is carried out by respective SPCBs/PCC. There are 165 WQM stations monitoring locations in Gujarat out of which 82 location are monitored on monthly basis while 83 location are monitored on half yearly basis. Maharashtra has 250 Water Quality Monitoring sites. At 200 sites monitoring is conducted on monthly basis and at 50 sites monitoring is conducted on half yearly basis. In UT of Daman monitoring is conducted at 24 Water Quality Monitoring sites on monthly basis and 13 sites on half yearly basis. The main objective of surveillance is to ascertain that the prescribed sampling and analytical procedures are followed and the samples are collected as per the Central Pollution Control Board guidelines. During the year surveillance monitoring was conducted at 27 NWMP sites in Gujarat and 26 sites in Maharashtra.

5.2 SURVEILLANCE OF NATIONAL AIR QUALTIY MONITORING (NAMP) PROGRAMME

5.2.1 Air Quality Parameters Monitored

Surveillance of National Air Quality Monitoring Programme (NAMP) Station

The NAMP stations are operated by respective state boards, educational instituton and other agencies. Central Pollution Contol Board regularly undertakes survelliance of National Ambient Air quality monitoring stations under NAMP Programme to verify whether the CPCB guidelines are being followed during the monitoring and analysis of samples by the monitoring agencies.

Table 5.12 : NAMP Netwark at a glance (31st March 2014)

Ambient air quality station	-	700
State/UT covered	-	28 States & 7 UTs
Cities covered under National Network (NAMP)	-	300
1. Total no. of operating stations	-	573
No. of stations in Sensitive Areas other than Ecologically sensitive areas notified by GOI	-	14
Target during XIth Five year plan	-	700 (Achieved)
B. Status of Air Quality in India		
Criteria air pollution for ambient	-	(Sulphur Dioxide, Nitrogen Dioxide & PM_{10} Particulate Matter ≥ 10 micron size)
Other notified Air Pollutants monitored in selected cities/ locations	-	PAH (BaP), CO, O_3, NH_3, $PM_{2.5}$, C_6H_6 , Pb, Ni, As, H_{2s}
Percentage & Number of cities exceeding the permissible limit w.r.t. PM_{10} and NO_2 (2011)	-	81% - PM_{10} – 139 cities 14% - NO_2 – 24 cities
C. Status of Air Quality in Metro cities		
Total no. of operating stations in metro cities		206
Status of Air Quality in 53 Major/Metropolitan Cities	-	53 metro cities data upto 2012
53 Metropolitan cities as per census 2011	-	Out of 53 cities, 50 cities having operational ambient air quality monitoring stations
Percentage & Number of major cities exceeds the permissible limit	-	16% - NO2 at 08 cities, out of 50 cities 88 % - PM10 – At 44 cities, out of 50 cities
D. Non Attainment/Non compliaut Cities		
Non-attainment cities	-	72 (23 States)

Non-attainment cities on the basis of 2008-2010	-	95 nos. (23 States)
F. Strengthening of NAMP		
Strengthening of AAQMS during 2010 -2011	-	143 Ambient Air Quality Stations
Strengthening of AAQMS during 2011-2012	-	35 Ambient Air Quality Stations
Target Achievement		
i) 2011-2012 New proposed stations (Criteria Pollutants)	-	35 stations (Achieved)

Under NAMP criteria pollutants viz. PM_{10} (Particulate Matter having an aerodynamic diameter less than or equal to 10 µm), Sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2) are being monitored. Other notified air quality parameters are Carbon monoxide (CO), Ammonia (NH_3), Ozone (O_3), $PM_{2.5}$ (Particulate Matter having an aerodynamic diameter less than or equal to 2.5 µm), Benzo(a)pyrene {B(a)P}, Lead (Pb) and Nickel (Ni) are being monitored at selected monitoring locations. The meteorological parameters such as wind speed, wind direction, relative humidity and temperature have also been integrated with air quality monitoring.

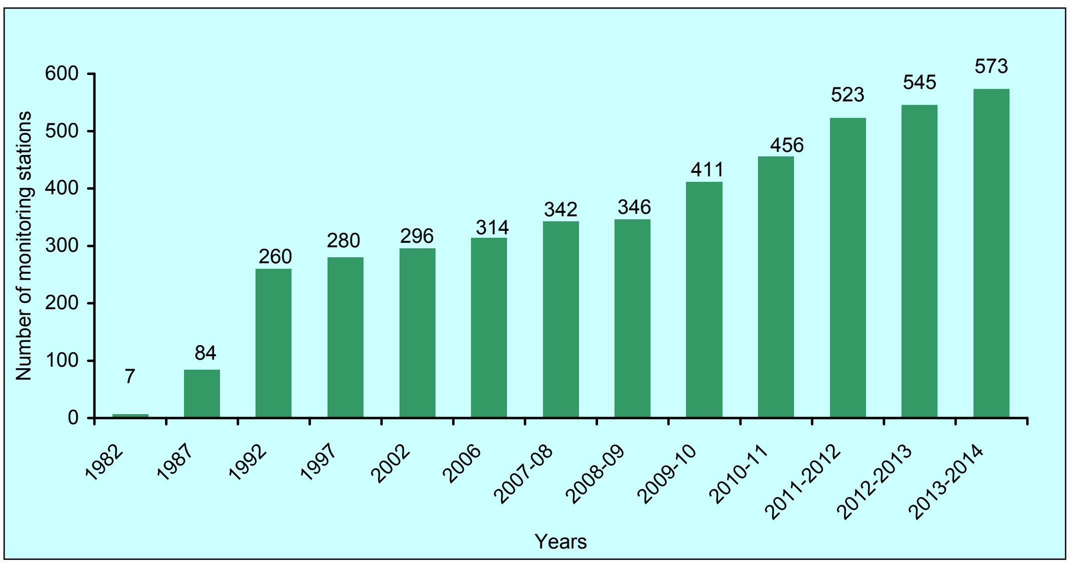


Figure 5.31 : Growth of Ambient Air Quality Monitoring Network (NAMP) in India (upto 31st March 2014)

Objectives of NAMP

i) To determine the status and trends of ambient air quality;

ii) To ascertain whether the prescribed ambient air quality standards are violated;

iii) To identify non-attainment cities with respect to national standards and;

iv) To obtain the knowledge and understanding necessary for initiating preventive and corrective measures.

The monitoring under the NAMP is being carried out in collaboration with zonal offices of Central Pollution Control Board, State Pollution Control Boards; Pollution Control Committees and CSIR National Environmental Engineering Research Institute (NEERI). CPCB co-ordinates with these collaborating agencies to ensure consistency in air quality data and provides technical & financial support.

5.2.2 Air Quality Monitoring of Metropolitan cities/Million Plus cities

Urbanization, population growth has been mainly centered around major cities due to large scale migration of rural population. Increase in industrial activities, population both endemic and floating and vehicular population etc. have led to a rapid increase in environmental problems.

Table 5.13: Air Quality Monitoring Stations in Metropolitan Cities Million plus cities

Zone	State	City	Population (in lakhs, Census 2011)	Type & category of city	No. of Operating Stations
North Zone	Delhi (10)	Delhi	16,314,838 (UA)	RIRuO	10
	Haryana (2)	Faridabad	1,404,653 (M.Corp)	RIRuO	2
	Jammu & Kashmir	Srinagar @	1,273,312 (UA)	ES (Hill station)	0
	Punjab (6)	Amritsar	1,183,705 (UA)	RIRuO	2
		Ludhiana	1,613,878 (M.Corp)	RIRuO	4
	Uttar Pradesh (28)	Agra	1,746,467 (UA)	ES (Taj trapezium)	6
		Allahabad	1,216,719 (UA)	RIRuO	2
		Ghaziabad	2,358,525 (UA)	RIRuO	2
		Kanpur	2,920,067 (UA)	RIRuO	9
		Lucknow	2,901,474 (UA)	RIRuO	5
		Meerut	1,424,908 (UA)	RIRuO	2
		Varanasi	1,435,113 (UA)	RIRuO	2
East Zone	Bihar (2)	Patna	2,046,652 (UA)	RIRuO	2
	Chattisgarh (3)	Raipur	1,122,555 (UA)	RIRuO	3
	Jharkhand (4)	Dhanbad	1,195,298 (UA)	RIRuO	3
		Ranchi	1,126,741 (UA)	RIRuO	1
	West Bengal (14)	Kolkata	14,112,536 7 (UA)	RIRuO	10
		Howrah	1,072,161		4

Zone	State	City	Population (in lakhs, Census 2011)	Type & category of city	No. of Operating Stations
South Zone	Andhra Pradesh (24)	Hyderabad (GH)	7,749,334 (UA)	RIRuO	10
		Vijayawada	1,491,202 (UA)	RIRuO	3
		Vishakhapatnam (GVMC)	1,730,320 (M.Corp)	RIRuO	11
	Karnataka (9)	Bengaluru (BBMP)	8,499,399 (UA)	RIRuO	9
	Tamilnadu (17)	Chennai	8,696,010 (UA)	RIRuO	11
		Coimbatore	2,151,466 (UA)	RIRuO	3
		Madurai	1,462,420 (UA)	RIRuO	3
West Zone	Gujarat (15)	Ahmedabad	6,352,254 (UA)	RIRuO	6
		Rajkot	1,390,933 (UA)	RIRuO	2
		Surat	4,585,367 (UA)	RIRuO	3
		Vadodara	1,817,191 (UA)	RIRuO	4
	Maharashtra (33)	Aurangabad	1,189,376 (UA)	RIRuO	4
		Mumbai (GM)	18,414,288 (UA)	RIRuO	3
		Nagpur	2,497,777 (UA)	RIRuO	7
		Nashik	1,562,769 (UA)	RIRuO	4
		Pune	5,049,968 2 (UA)	RIRuO	3
		Vasai-virar #	1,221,233 (M.Corp)	NA	-
		Thane	1,818,872	RIRuO	3
		Navi Mumbai	1,119,477	RIRuO	6
		Pimpri-Chinchwad	1,729,320	RIRuO	1
		Kalyan-Dombivali	1,246,381	RIRuO	2
	Rajasthan (15)	Jaipur	3,073,350 (M.Corp)	RIRuO	6
		Jodhpur	1,137,815 (UA)	RIRuO	6
		Kota	1,001,365 (M.Corp)	RIRuO	3
Central Zone	Madhya Pradesh (10)	Bhopal	1,883,381 (UA)	RIRuO	4
		Gwalior	1,101,981 (UA)	RIRuO	2
		Indore	2,167,447 (UA)	RIRuO	3
		Jabalpur	1,267,564 (UA)	RIRuO	1
5 zones	**16 states 193 sanctioned stations**	**46 cities**	--	**--**	**192 stations**

Note: Figures within parentheses represent sanctioned monitoring stations; @monitoring stations not yet operational; RIRuO – Residential/industrial/rural/other areas; ES –

Ecologically sensitive area; GVMC-Greater Visakhapatnam Municipal Corporation, GM-Greater Mumbai; GH-Greater Hyderabad, BBMP-Bruhat Bengaluru Mahanagar Palika; Popolation Data: http://censusindia.gov.in/2011-prov-results/paper2/data_files/india2/Million_Plus_UAs_Cities_2011.pdf

Air Quality Status

The ambient air quality has been evaluated in terms of low, moderate, high and critical levels by exceedence factor as calculation as below:

$$\text{Exceedence Factor} = (\text{EF}) \frac{\text{Observed annual mean concentration of criteria pollutant}}{\text{Annual standard for the respective pollutant and area class}}$$

Four Air quality categories are defined based on exceedance factor.

- Critical pollution (C) : when EF is more than 1.5;
- High pollution (H) : when the EF is between 1.0 - 1.5;
- Moderate pollution (M) : when the EF between 0.5 - 1.0; and
- Low pollution (L): when the EF is less than 0.5.

Table 5.13 : Pollution Level Classification

Pollution level	Annual Mean Concentration Range (µg/m³)					
	Industrial, Residential, Rural & other Areas			Ecologically Sensitive Area		
	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
Low (L)	0-25	0-20	0-30	0-10	0-15	0-30
Moderate (M)	26-50	21-40	31-60	11-20	16-30	31-60
High (H)	51-75	41-60	61-90	21-30	31-45	61-90
Critical (C)	>75	>60	>90	>30	>45	>90

The air quality at metropolitan cities has been assessed as per the classification Table 5.13.

The air quality with respect to SO_2 indicate that all cities except Ghaziabad are in the low category and within prescribed standard. With respect to NO_2, 07 cities are in the low category, 25 cities are in the moderate category, 06 in high and 01 in critical category (Table 5.14) With respect to PM_{10}, 02 are in moderate category, 08 under high and 29 cities are in critical category (Table 5.15).

The metropolitan area is a region consisting of a densely populated urban core and less-populated surrounding territories, sharing industry, infrastructure, and housing. As per the Census 2011, cities will more than 10 lakh of population have been categorized as metropolitan cities. There are 46 Metropolitan or Million Plus cities in the country.

Of the 46 million plus / metropolitan cities, 07 cities (18%) and 37 (95%) cities exceed the NAAQS with respect to NO_2 and PM_{10}. None of the cities exceeded the aribient air quality standard with respect to SO_2.

Table 5.14: Air Quality in Million Plus / Metropolitan Cities of India Year 2012

State	City	No. of Operating Stations	SO_2		NO_2		PM_{10}	
			Annual average (µg/m³)	Air Quality	Annual average (µg/m³)	Air Quality	Annual average (µg/m³)	Air Quality
Andhra Pradesh (24)	Hyderabad (GH)	10	4	L	28	M	79*	H
	Vishakhapatnam (GVMC)	11	11	L	13	L	71*	H
	Vijaywada	3	6	L	12	L	97*	C
Bihar (2)	Patna	2	6	L	36	M	166*	C
Chattisgarh (3)	Raipur	3	14	L	39	M	267*	C
Delhi (10)	Delhi (DMC)	10	5	L	59*	H	237*	C
Gujarat (15)	Ahmedabad	6	12	L	23	M	79*	H
	Rajkot	2	13	L	17	L	97*	C
	Surat	3	16	L	26	M	97*	C
	Vadodara	4	15	L	31	M	98*	C
Haryana (2)	Faridabad	2	12	L	39	M	192*	C
Jammu & Kashmir (0)	Srinagar	0	@	@	@	@	@	@
Jharkhand (4)	Dhanbad	3	17	L	40	M	178*	C
	Ranchi	1	18	L	35	M	202*	C
Karnataka (9)	Bangaluru (BBMP)	9	14	L	29	M	118*	C
Madhya Pradesh (10)	Bhopal	4	3	L	20	L	167*	C
	Gwalior	2	13	-	27	-	329*	-
	Indore	3	12	L	20	L	143*	C
	Jabalpur	1	2	L	24	M	82*	H
Maharashtra (33)	Aurangabad	4	9	L	32	M	80*	H
	Mumbai	3	5	L	20	L	117*	C
	Nagpur	7	10	L	32	M	103*	C
	Nashik	4	24	L	27	M	95*	C
	Pune	3	22	L	44*	H	93*	C
	Vasai-virar	0	NA	NA	NA	NA	NA	NA
	Thane	3	20	L	12	L	72*	H
	Navi Mumbai	6	17	L	43*	H	120*	C
	Kalyan Dombivali	2	53	-	89*	-	123*	-
	Pimpri Chinchwad	1	22	L	47*	H	89*	H

State	City	No. of Operating Stations	SO_2		NO_2		PM_{10}	
			Annual average (µg/m³)	Air Quality	Annual average (µg/m³)	Air Quality	Annual average (µg/m³)	Air Quality
Punjab (6)	Amritsar	2	15	-	39	-	202*	-
	Ludhiana	4	11	L	27	M	228*	C
Rajasthan (15)	Jaipur	6	9	L	52*	H	182*	C
	Jodhpur	6	6	L	23	M	185*	C
	Kota	3	12	L	32	M	156*	C
Tamilnadu (17)	Chennai	11	12	L	21	M	57	M
	Coimbatore	3	3	L	27	M	68*	H
	Madurai	3	10	L	23	M	48	M
Uttar Pradesh (28)	Agra	6	5	L	23*	M	196*	C
	Allahabad	2	4	L	32	M	317*	C
	Ghaziabad	2	30	M	34	M	247*	C
	Kanpur	9	8	L	34	M	215*	C
	Lucknow	5	8	L	32	M	211*	C
	Varanasi	2	18	L	21	M	138*	C
	Meerut	2	4	L	43*	H	129*	C
West Bengal (14)	Kolkata	10	12	L	72	C	135*	C
	Howrah	4	13	-	40	-	186*	-

C: Critical; H: High; M; Moderate; L: Low

Table 5.15: No. of with low, moderate, high & critical air quality 2012 (residential/industrial/commercial/rural and sensitive)

Category	Number of Metropolitan cities (population > 10 lacs)					
	Residential / industrial / rural / commercial areas			Ecologically sensitive area		
	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
Low (L)	38	7	0	1	0	0
Moderate (M)	1	25	2	0	1	0
High (H)	0	6	8	0	0	0
Critical (C)	0	1	29	0	0	1
Inadequate data	4	4	4	0	0	0
Non operational monitoring station	0	0	0	1	1	1
No monitoring station	1	1	1	0	0	0
Total LMHC	39	39	39	1	1	1
Total million plus cities (as per Census 2011)	44	44	44	2	2	2

Remark. Low, moderate, high, critical cities are based on Pollution Level Classification.

Table 5.16: Number of metropolitan cities exceeding the NAAQS 2012 (Based on annual average data)

Category	Number of Metropolitan cities (population > 10 lacs)					
	Residential / industrial / rural / commercial areas			Ecologically sensitive area		
	SO_2	NO_2	PM_{10}	SO_2	NO_2	PM_{10}
Total metro cities (as per Census 2011)						
No of cities Not exceeding NAAQS	39	32	2	1	1	0
Cities exceeding NAAQS	0	7	37	0	0	1
Cities with inadequate data	4	4	4	0	0	0
Cities with no operational monitoring station	0	0	0	1	1	1
Cities with no monitoring station	1	1	1	0	0	0
	44	44	44	2	2	2

The air quality status with respect to SO_2, NO_2 and PM_{10} for Million Plus cities in the country is presented in figures 5.32 to 5.34.

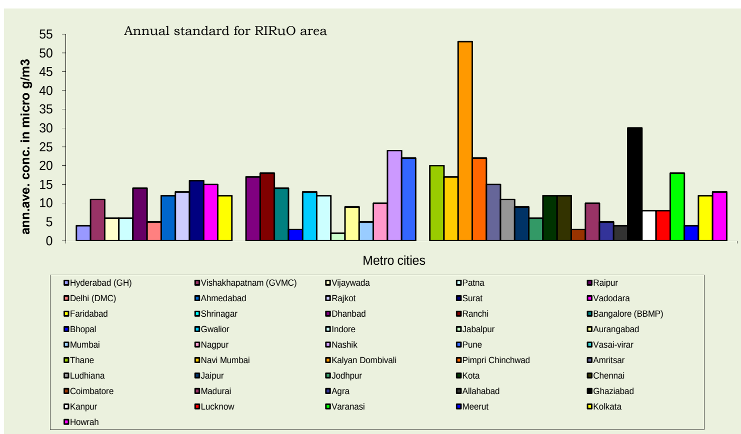


Figure 5.32 : SO_2 levels (annual) in the 46 million plus (metro) cities, 2012

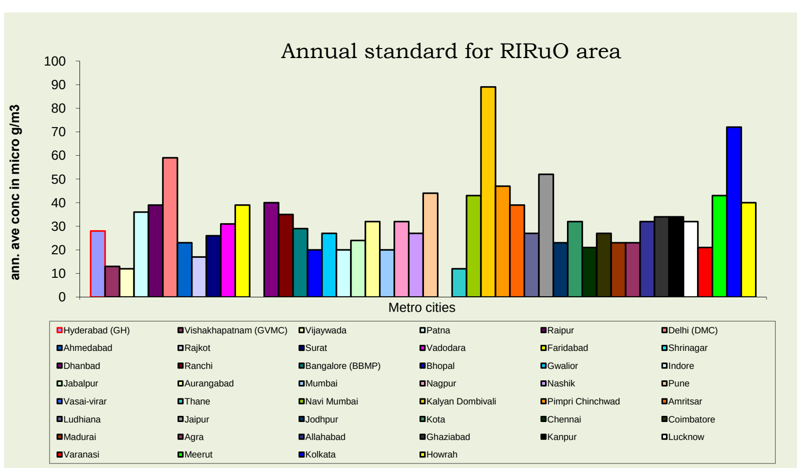


Figure 5.33 : NO_2 levels (annual) in the 46 million plus (metro) cities, 2012

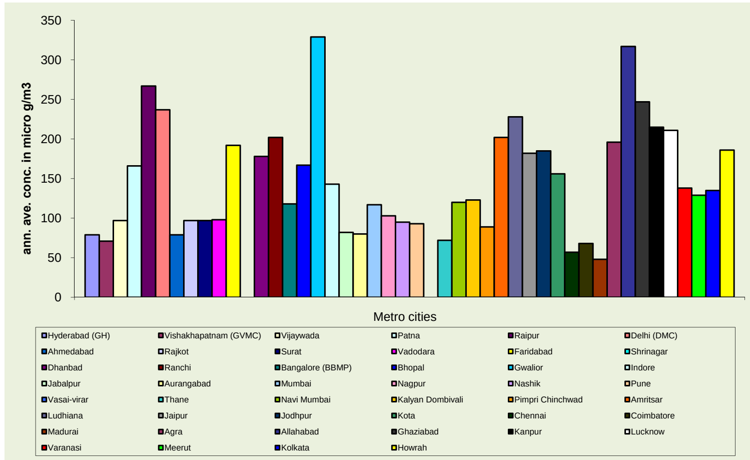


Figure 5.34 : PM_{10} levels (annual) in the 46 million plus (metro) cities, 2012

5.2.3 Ambient Air Quality Monitoring In Delhi

The ambient air quality is monitored by Central Pollution Control Board at six locations in Delhi (Pitampura, Sirifort, Janakpuri Nizamudin, Shahzadabagh & Shahdara under NAMP for past many years. A comparison of the ambient air quality with respect to Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2), Particulate matter (PM_{10}) and Particulate matter ($PM_{2.5}$) during year 2013 have been made with previous year and the finding are as below:

Sulphur dioxide (SO_2):

The annual mean concentration of sulphur dioxide (Fig. 5.35) all the six locations was almost same as that of previous year and was well within the National Ambient Air Qualty Standard (NAAQS).

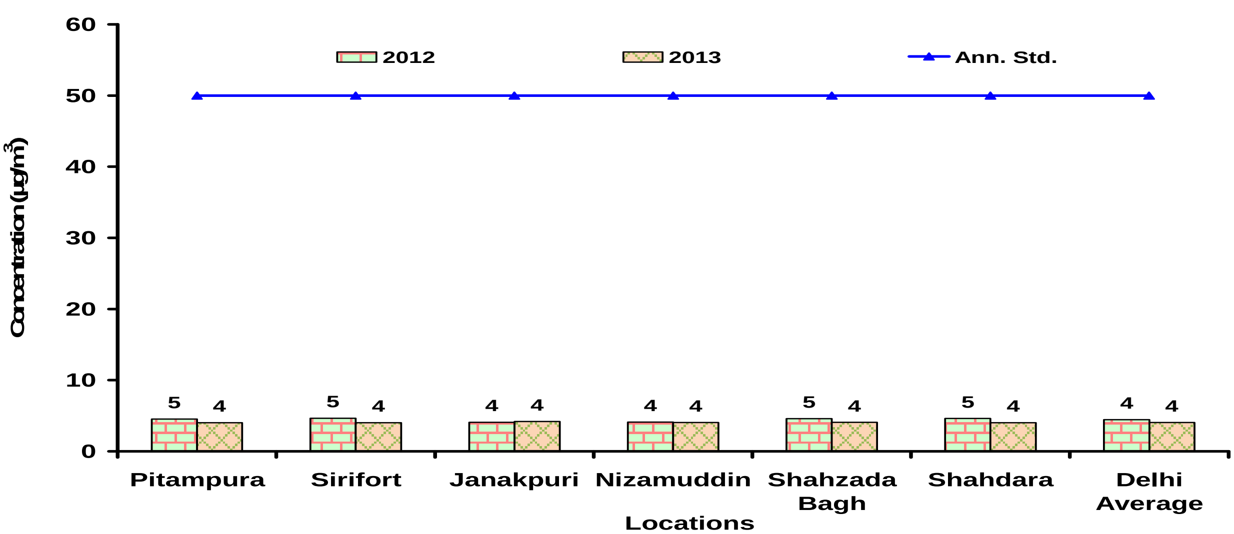


Figure 5.35 : Annual Mean Concentration of Sulphur Dioxide at Monitoring Stations in Delhi during 2012 & 2013

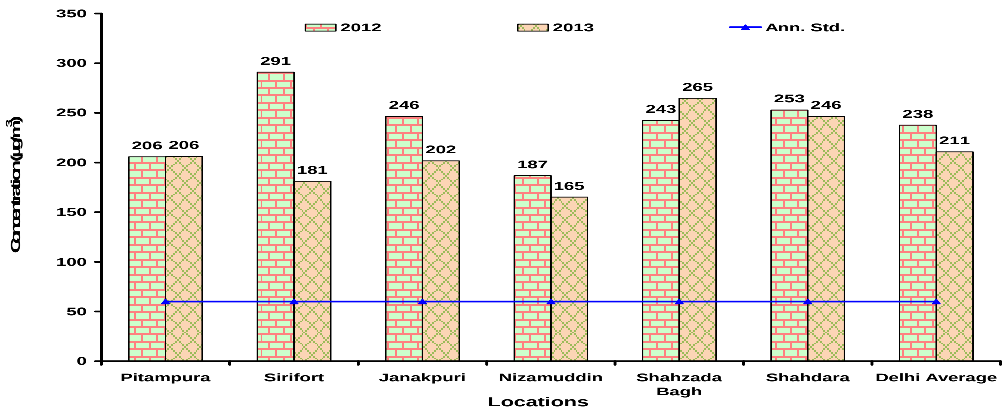


Figure 5.36 : Annual Mean Concentration of PM_{10} at Monitoring stations in Delhi during 2012 & 2013

Nitrogen dioxide (NO_2):

The annual mean concentration of nitrogen dioxide measured at four locations (Pitampura, Janakpuri, Shahzadabagh & Shahdara) indicated an increasing trend Fig 5.36) while at Sirifort decreasing trend was observed. No change was observed at Nizamuddin station.

The annual mean concentration for NO_2 was above NAAQs and indicated slight increase (4%) with respect to previous year.

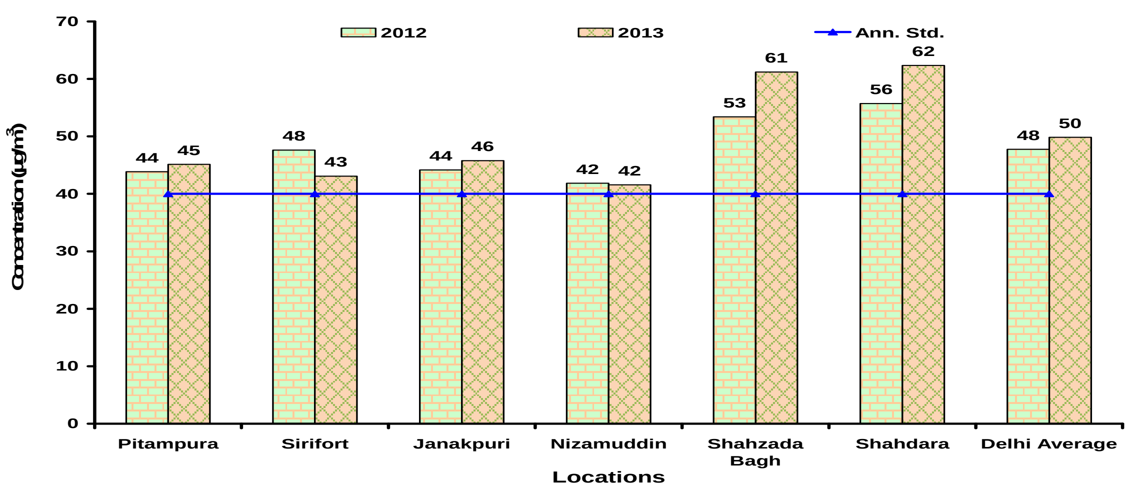


Figure 5.37 : Annual Mean Concentration of Nitrogen Dioxide at Monitoring Station in Delhi during 2012 & 2013

Particulate Matter (PM_{10}):

The annual mean concentration of Particulate Matter (PM_{10}) Fig. 5.37 indicated decreasing trend at four locations (Sirifort, Janakpuri, Nizamuddin and Shahdara) while there was increasing trend at one location (Shahzada Bagh). There is no change at Pitampura. The average concentration for PM_{10} exceeded the NAAQs at all the location and have shown a decrease (13%) with respect to previous year.

Particulate Matter ($PM_{2.5}$):

Particulate Matter ($PM_{2.5}$) refers to particulate matter that is 2.5 micrometers or smaller in size and includes a mixture of solids and liquid droplets present in ambient air. The sources of $PM_{2.5}$ include all types of combustion, motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and industrial processes. Fine particles are of greater concern because they pose health risk to humans. FRM sampler is used for monitoring of PM 2.5 particles. Annual mean concentration of $PM_{2.5}$ shows an increasing trend at four locations (Sirifort, Janakpuri, Nizamuddin and Shahzadabagh) and decreasing trend at two locations (Pitampura and Shahdara) during 2013 in comparison to 2012.

The annual mean concentration of $PM_{2.5}$ (Fig. 5.38) ranged between 57 µg/m^3 at Janakpuri and 88 µg/m^3 at Shahzada Bagh during 2013. The $PM_{2.5}$ level exceeded the prescribed annual mean National Annual Standard of 40 µg/m^3 at all the locations.

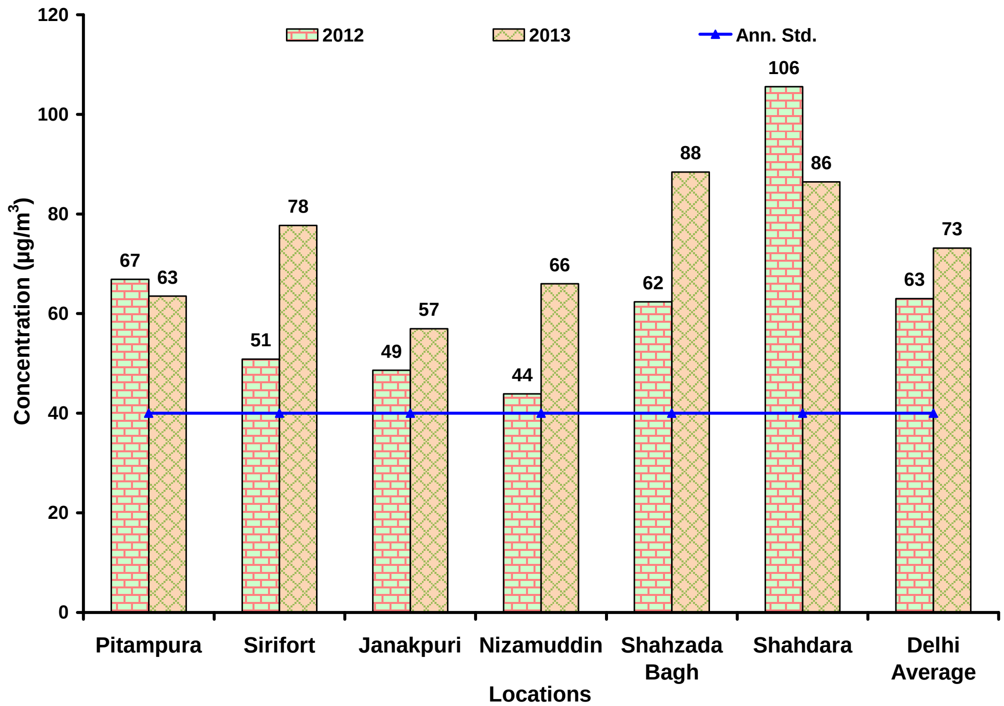


Figure 5.38 Annual Mean Concentration of $PM_{2.5}$ at Monitoring stations in Delhi during 2012 & 2013

5.2.4 Ambient particulate metals (lead, nickel and arsenic) in Delhi

Central Pollution Control Board is monitoring lead, nickel and arsenic in PM_{10} at seven locations (Pitampura (PP), Sirifort (SF), Nizamuddin (NZ), Janakpuri (JP), Shahdara (SH), Shahzada Bagh (SB) and traffic intersection Pragati Maidan (PM) in Delhi.

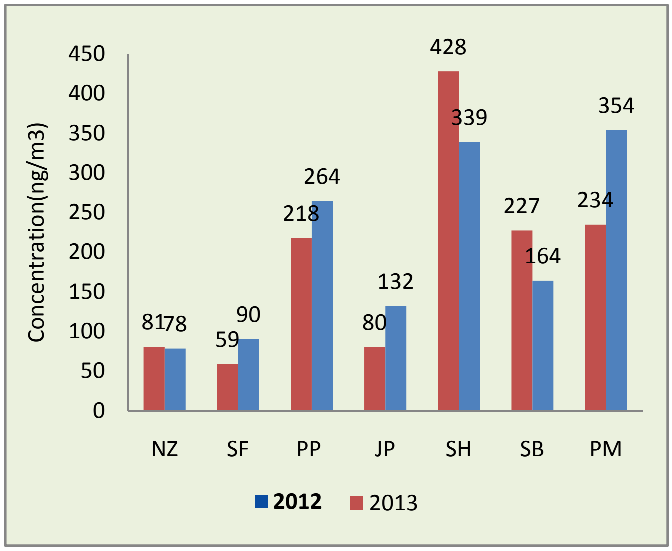


Figure 5.39 : Particulate Lead in Ambient Air of Delhi (2012 & 2013)

In ambient air, Lead, Nickl & Arsenic Metels are contributed by natural as well as anthropogenic sources and affect synthesis of haemoglobin in blood, cause damage to kidneys. Human's exposure to lead can couse biological effects depending on the level and duration of exposure.

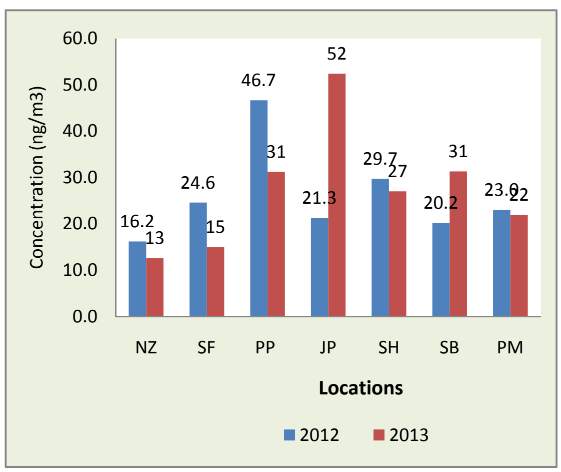


Figure 5.40 : Particulate Nickel in Ambient Air of Delhi 2012 & 2013

Nickel in ambient air is contributed from combustion of fuel oil, coke in power plants, refineries and other industries. Long-term exposure can cause heart and liver ailments.

Arsenic has wide range of health effects such as Skin rashes, lung ailments and kidney failure.

The annual mean concentration of particulate lead (Fig. 5.39) in the year 2012 and 2013 were observed in the range of 78.0 ng/m^3 to 354.0 ng/m^3 and 80.0 ng/m^3 to 428.0 ng/m^3 respectively.

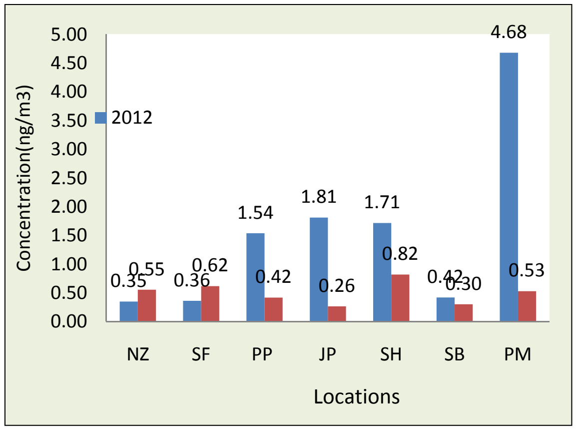


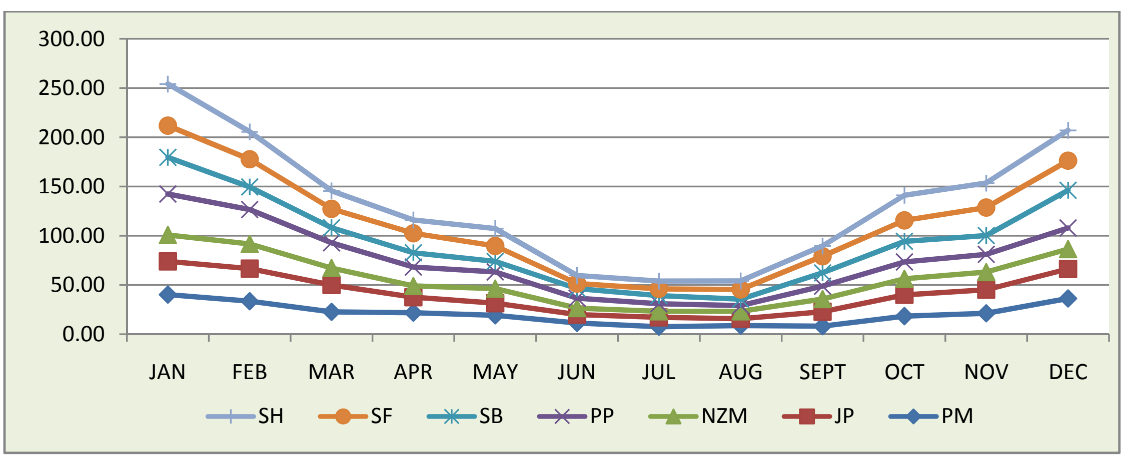
Figure 5.41 : Particulate Arsenic in Ambient Air of Delhi 2012 & 2013

The mean concentration of particulate nickel (Fig. 5.40) were observed in the range of 16.2 ng/m³ to 46.7 ng/m³ (2012) and 13.0 ng/m³ to 52.0 ng/m³ (2013) and exceeded the permissible limits of 20.0 ng/m³ at all the locations during year 2012 except for Nizamuddin at and five locations (Pitampura, Janakpuri, Shahzadabagh, Shahdara and Pragati Maidan) during year 2013. The Arsenic in ambient air (Fig. 5.41) were observed well within the prescribed standard limits (6.0 ng/m³).

5.2.5 Particulate Aromatcic Hydrocarbon (PAHs) Monitoring at NAMP Stations Delhi

Poly Aromatic Hydrocarban (PAHs) in particulate phase were monitored at seven NAMP stations in Delhi and analyzed on GC-FID.

The benzo (a) pyrene (BaP) and Total PH was higher during winter (Jan/Feb) and leave in monsoon season. The B(a)P ranged between 0.39-10.28 ng/m3 while TPAH ranged between 5.19-42.28 ng/m³ (Fig. 5.42).



PM: Pragati Maidan, JP: Janakpuri, NZM: Nizamuddin, PP: Pitampura, SB: Shahzada Bagh, SF: Sirifort, SH: Shahdara

Figure 5.42 : Total Poly aromatic hydrocarban (TPAH) Profile in Delhi during 2013

5.2.6 Mixing Height (with SODAR System) in Delhi

Sound Detection and Ranging (SODAR) system is in continuous operation to monitor the lower atmosphere and asses desbelsion of pollutants by calculation of Mixing height. Mixing height in the periods of high/low convective activity are presented in Table 5.16 & 5.17.

Table 5.16 : Mixing height in Delhi

Month/ Year	Monthly Mean (m)		Maximum (Hourly average)		Minimum (Hourly average)	
	2012	2013	2012	2013	2012	2013
January	554	465	1706	1600	100	95
February	664	548	1749	1579	115	90
March	654	-	1749	1494	115	110
April	674	614	1749	1749	120	110
May	659	576	1706	1621	110	105
June	687	-	1664	1621	105	105
August	-	629	-	1706	-	100
September	-	639	-	1791	-	110
October	561	593	1600	1706	95	95
November	445	495	1558	1621	95	100
December	489	497	1579	1600	90	90

The monthly mean mixing height was lowest in November 2012 (445 metres) and Jan 2013 (465 m) while lowest mixing height (QOM) was in December 2012, June 2013 (105m) and Dec 2013 (90m) Highest mixing height (1749m) was recorded in the month of February, March (1749m) and April (1749m) during 2012.

Table 5.17 : Mean mixing height in periods of high/low convective activity

Months/Year	Mean mixing height in period of high convective activity		Mean mixing height in period of low convective activity	
	2012	2013	2012	2013
January	1325	1142	279	263
February	1440	1265	329	283
March	1343	1216	337	267
April	1387	1237	319	270
May	1202	1206	316	200
June	1311	1298	295	185
August	-	1262	-	260
September	-	1325	-	234
October	1239	1231	249	242
November	1140	1199	241	248
December	1211	1239	285	276

The mean mixing height in the period of low convective activity was lowest in November 2012 (241 m) and in June 2013 (185 m). Duration of high convective activity was minimum in November 2012, Jan 2013, Nov 2013.

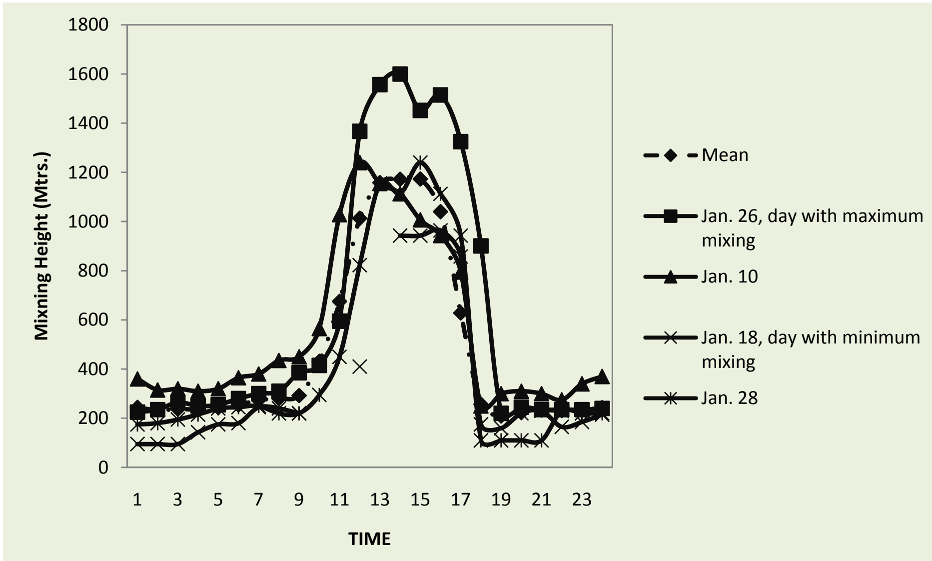


Figure 5.43 : Diurnal Variation of Mixing Days of January 2013

5.2.7 Influence of Height of Boundary Layer on Pollutants Profile in Delhi

The height of atmospheric boundary layer or atmospheric mixing height is one of the influential factor that governs concentration of air pollutants. Delhi lies in sub-tropical region with semi-arid climatic condition and seasonal temperature variation These environmental condition affect air pollutants profile in winter months (November to February). when thermal plume becomes quite affecting dispersive capacity. Central Pollution Control Board regularly monitoring height of bounding layer at upper atmosphere by sound detection and ranging (SODAR) system. The variation of PM_{10} with mixing height both in high convective activity (with thermal plumes) and low convective activity (with no thermal plumes) are presented in Figs. 5.44 & 5.45.

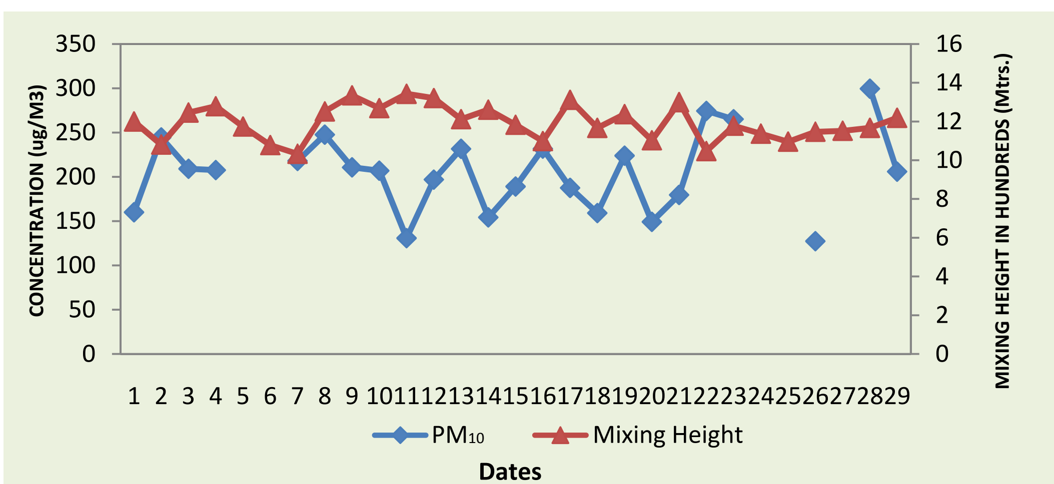


Figure 5.44 : Variation of PM_{10} with Mixing Height during Period of High Convective Activity - November 2013

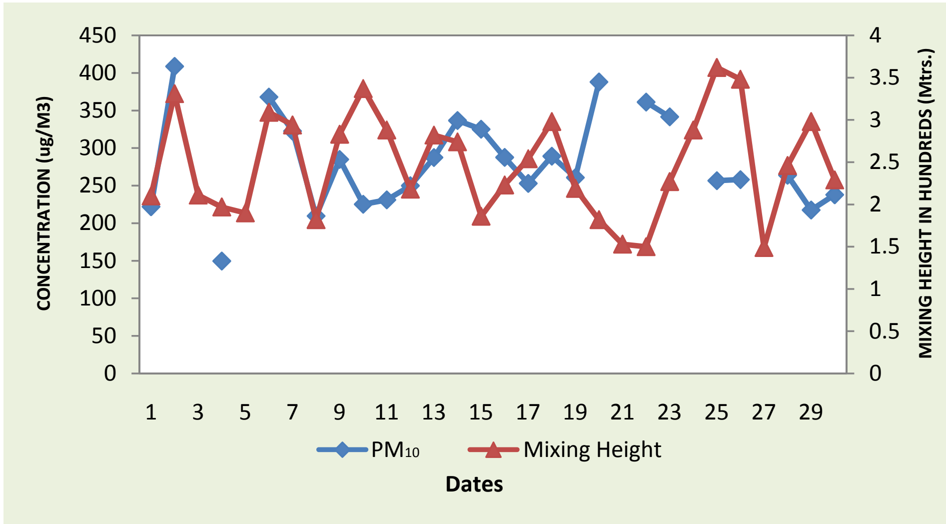


Figure 5.45 : Variation of PM_{10} Concentration with Mixing Height during Period of Low Convective Activity - November 2013

5.2.8 Pilot Emission Trading Scheme (ETS)

The Central Pollution Control Board has been identified as nodal agency by Ministry of Environment & Forests (MoEF) for pilot project on Emission Trading Scheme using Particulate Matter as marker. The three State Pollution Control Boards of Tamil Nadu, Maharashtra and Gujarat are partner agencies in the project which emphasis introduction of market-based regulatory instrument or mechanism for particulate matter (PM) air pollution from industrial sources.

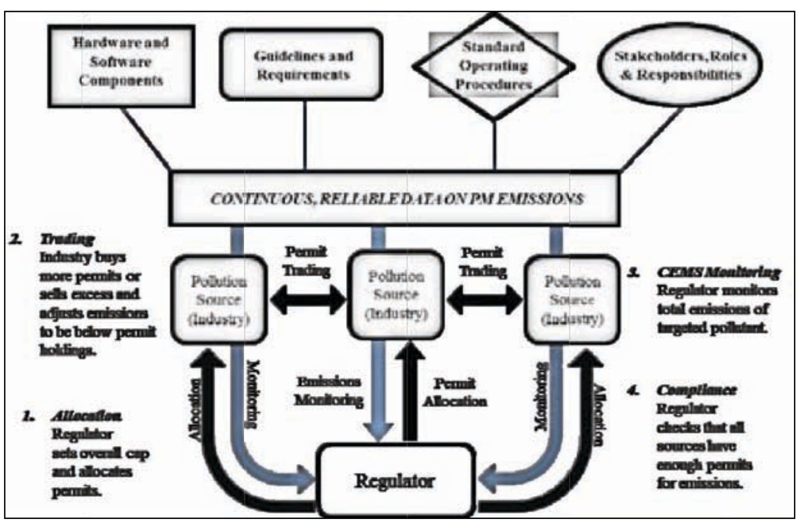


Figure 5.46 : Schemetic Presentation of Pilot Emission Trading Scheme (ETS)

The project activities, design, implementation, and evaluation of (CEMS) framework and particulate ETS. Approximately 1,000 industries in clusters have been identified in the three pilot states for implementation of the project.

The Baseline Phase includes the technical preparedness for data acquisition, data transfer, data collation, emission load estimation for CPCB & this framework would connect CEMS devices with participating SPCBs regulator servers and ensure reliable and accurate emissions data to support the pilot ETS.

During 2013-2014 the baseline activities as below have been taken up:

- A comprehensive baseline survey of the pilot industries to provide information on baseline conditions including PM-pollution load, air pollution control equipment & these operation, optimisation of fuel-used, among other parameters.
- An engineering-economic model to be developed using inputs from the baseline survey as well as real time CEMS readings from pilot installations to set the final parameters of the trading scheme (e.g. level of caps and sub-caps, level of price ceiling, permit allocation rules, etc.).

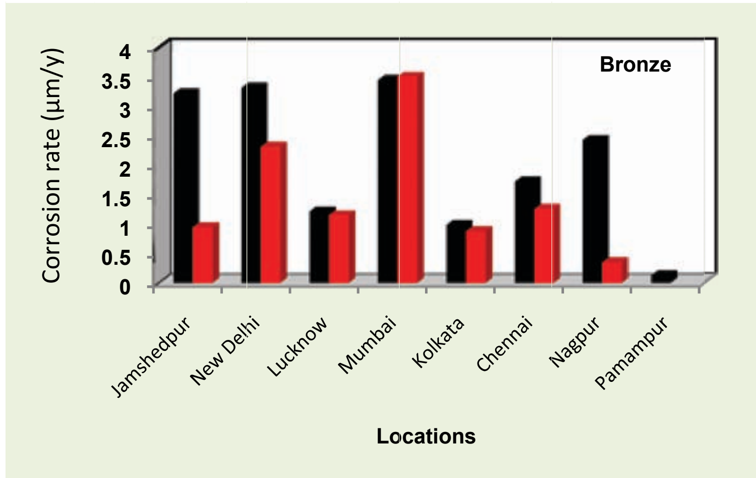
5.2.9 Implementation of Malè Declaration:

Central Pollution Control Board (CPCB) has been recognized as National Implementation of Agency (NIA) for "Malè Declaration on Control & Prevention of Air Pollution and its likely trans-boundary effects for South Asia" Six trans-boundary air quality monitoring stations have been established by CPCB, national emission inventory pepared and represented in various programs organized by Malè Secretariat, Bangkok. CPCB laboratory has been recognized as Regional Laboratory for Dry and Wet Deposition Studies for South Asia, while National Metallurgical Laboratory (CSIR Laboratory at Jamshedpur) has been recognized as Regional Centre for Corrosion Studies with respect to impact of air pollution in South Asia.

During 13th Inter-Governmental Meeting (with respective participating countries NFP and NIA), held in May 2013 combined activities for phase V (2014-16) were identified. The action plans to be executed during year 2014 include organiging the 14th Inter-Governmental Meeting [IG14] 8th Regional Stake-holders cum coordination meeting [RSC8] 10th Regional Refresher Training Workshop on Trans-boundary Air Pollution [TW10] 4th meeting of the Task Force for Future Development [TFFD4] Regional Training Workshop on Impact Assessment (crop & materials). Central Pollution Control Bord will be conducting 10th Regional Refresher Training Workshop on Trans-boundary Air Pollution [TWTAP10] for the participating countries during the year 2014.

5.2.10 Studies on impact of air pollution on corrosion of metallic and non-metallic materials:

The project on impact of air and environment pollution on corrosion of metallic and nonmetallic materials at different locations of India was undertaken by Central Pollution Control Board. Solid pieces of metals viz., copper, steel, brass, bronze, aluminum and the non-metals viz., granite, Makrana- marble and shine marble are



exposed in different areas. The study envisayes determnation of corrosion rate with reference to air pollution and laboratory experiments determination of dose-response relations of various air pollutants. During the year, corrosion determination carried out for corrosion rate assessment, impedance measurement and characterization of the corrosion products. The findings indicated that moist SO_2 environment is most aggressive in comparison to salt spray and UV radiation weathering tests, for studies metals and alloys; slowest rate of corrosion was observed for copper and brass. The corrosion rate decreases with time for all the metals / alloys.

The highest corrosion rate of various metals have been observed at Mumbai followed by Chennai > Jamshedpur > New Delhi >Kolkata > Lucknow> Palampur. The highest rate of corrosion at Mumbai may be attributed to high rain fall, wind velocity and salinity / humidity. The characterization of corrosion products of weathering steel exposed at different locations indicated that lepidocrocite phases of iron oxide (an unstable and non- protective oxide of iron) have been formed at Mumbai whereas at Lucknow the phases of maghemite (γ-Fe2O3, an oxide of iron which is most protective and stable) and lepidocrocite have been formed. The minimal impact of air pollution have been observed on aluminium. Weight loss and weight gain due to aberration effect and formation of carbonate product have been observed in exposed non-metallic material at from where Johrat no study candected cone at Jorhat has been found most corrosive for non-metallic materials.

5.2.11 Ambient Air Quality Monitoring In Himalayan Region (Himachal Pradesh)

Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB) are monitoring ambient air quality in urban areas while there is no monitoring location in ecologically sensitive areas, i.e. Himalayan region.

The monitoring was initiated by Central Pollution Control Board in collaboration with Himachal Pradesh Pollution Control Board for assessment of background air quality status with respect to air quality parameters RSPM (PM_{10}), SO_2, NO_2, PAHs, BTX, Metals, and Noise levels at selected locations of Himachal Pradesh between November 15th to 22nd, 2013.

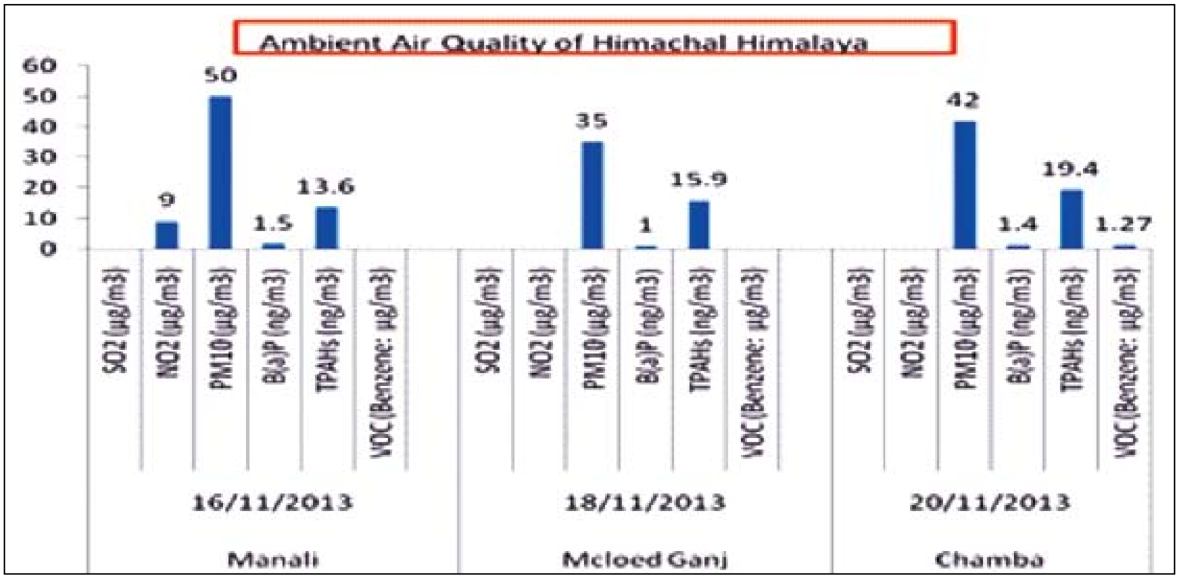


Figure 5.47 : Ambient Air Quality

The findings indicated that SO_2 and NO_2 was generally below the detection limit at all three monitoring locations. Particulate matter at all the three locations is well within the notified National Ambient Air Quality Standards. VOCs (Benzene) has been found well within notified range, while B(a) P concentration was at most near to National standards. Trace metals in respirable particulate matter are well within the prescribed national standards except for the values of lead at Manali monitoring station.

5.2.12 Ambient Air and Noise Pollution Levels During Deepawali 2013

Ambient Air quality and Noise monitoring was conducted in Delhi during Deepawali 2013 (November 03, 2013) to assess the impact of bursting of crackers on Ambient Environment.

Ambient air monitoring was undertaken at seven locations and ambient noise monitoring at nine locations. Real Time Ambient Noise Monitoring was conducted at 35 locations in seven metro cities (Delhi, Mumbai, Chennai, Kolkata, Lucknow, Bangalore and Hyderabad).

Table 5.18: Ambient Noise Level in Delhi during Normal day & Deepawali day

S. No.	Location	Average Noise Level in dB (A) Leq. (Between 1800Hrs to 2200 Hrs)			
		Normal Day		Deepawali Day	
		Year 2012	Year 2013	Year 2012	Year 2013
01.	Lajpat Nagar (R)	58	56↓	81	79↓
02.	East Arjun Nagar (R)	57	59↑	74	72↓
03.	Mayur Vihar Phase – II (R)	48	60↑	73	83↑
04.	Pitam Pura (R)	56	61↑	75	73↓
05.	Kamla Nagar (R)	61	63↑	80	81↑

S. No.	Location	Average Noise Level in dB (A) Leq. (Between 1800Hrs to 2200 Hrs)			
		Normal Day		Deepawali Day	
		Year 2012	Year 2013	Year 2012	Year 2013
06.	Dilshad Garden (R)	58	59↑	78	80↑
07.	Ansari Nagar) (R)	58	56↓	76	81↑
08.	Connaught Place (C)	64	69↑	69	74↑
09.	I.T.O (C)	70	67↓	71	69↓

R – Residential, C – Commercial

Deepawali Day 2013 – 03rd November, Normal day: 29th October 2013

Deepawali Day 2012 – 13th November, Normal day: 06th November 2012

Volatile Organic Compounds (VOCs) in ambient air during Deepawali

VOC monitoring was conducted on Deepawali at three locations viz. East Arjun Nagar, Pitampura and Pragati Maidan at Delhi and results compared with those observed during pre-Deepawali Monitoring.

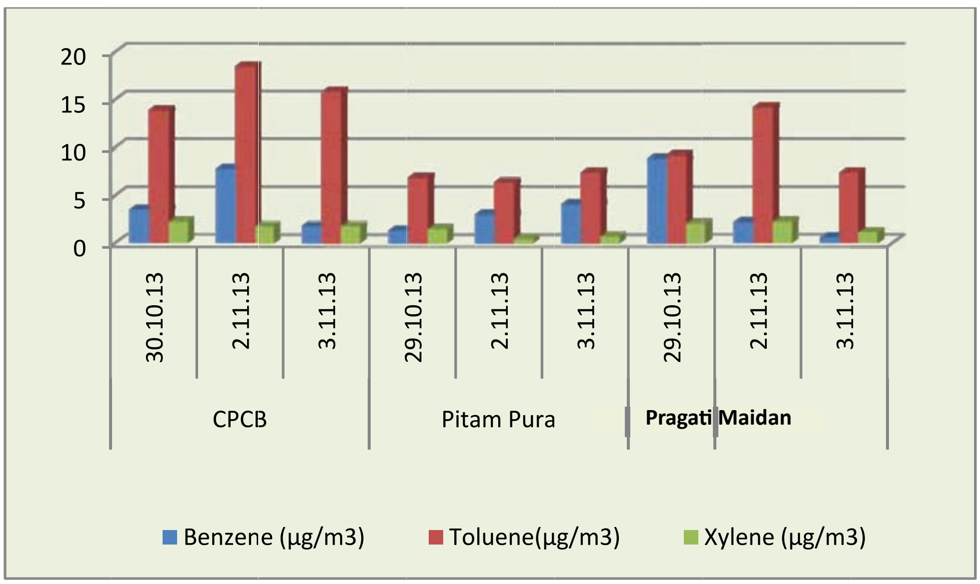


Figure: 5.48 : BTX values during Deepawali 2013

Pre Diwali day benzene concentrations were found higher on at location benzene. Concentration ranged between 0.6-8.9 µg/m^3 at Pragati Maidan (8.9 µg/m^3) due to high traffic and other means of transport. Toluene ranged between 6.4-18.5 µg/m^3 and xylene ranged between 0.5-2.3 µg/m^3.

5.2.13 Ambient Air Quality and Source Emission Monitoring on the direction of Hon'ble Court, Delhi

- Ambient Air Quality monitoring (PM_{10}, So_2, NO_2 and metals) was carried out at seven locations and source emmission monitoring at 2 nos of stacks at Timarpur Waste to Energy Plant, Okhla in compliance to directions of NGT, Delhi.

- Air quality monitoring was conducted at basement of 'B' block, Administrative Building, High Court of Delhi on 18th July 2013.

In addition, noise monitoring was also undertakens at basement of High Court.

Monitoring of boiler stack at Waste to energy plant, Okhla

Joint inspection cum-source emission monitoring as undertaken at 08 No. of Bio-medical waste treatment plants at Haryana state in association with Haryana State Pollution Control Board.

Source emission monitoring undertaken at nine Electroplating units, and three Steel Plants at Ghaziabad, U.P., in association with U.P. Pollution Control Board.

Stack monitoring of (Boilers, Pickling units) have been carried out at Noida and Ghaziabad in association with UPPCB.

5.2.14 Continuous Ambient Air Quality Monitoring in Delhi (CAAQM)

Three Continuous Ambieat Air Quality Monitoring stations at DMS (Residential Area), IHBAS and NSIT (Institutional Areas) in Delhi are being operated by Central Pollution Control Board under O&M Contract.

The annual average concentration of SO_2 at all the three stations were found well within the NAAQS limit of 50 $\mu g/m^3$ during year 2013 whereas the values of NO_2 at DMS Station execceded the NAAQS limit of 40 $\mu g/m^3$. The PM_{10} was exceeding NAAQS limit (60 $\mu g/m^3$) at all the three stations. The annual average of NH_3 at IHBAS Station was well within the NAAQS limit.

8 hourly average concentration of Carbon monoxide and Ozone have been found well within the NAAQS limit.

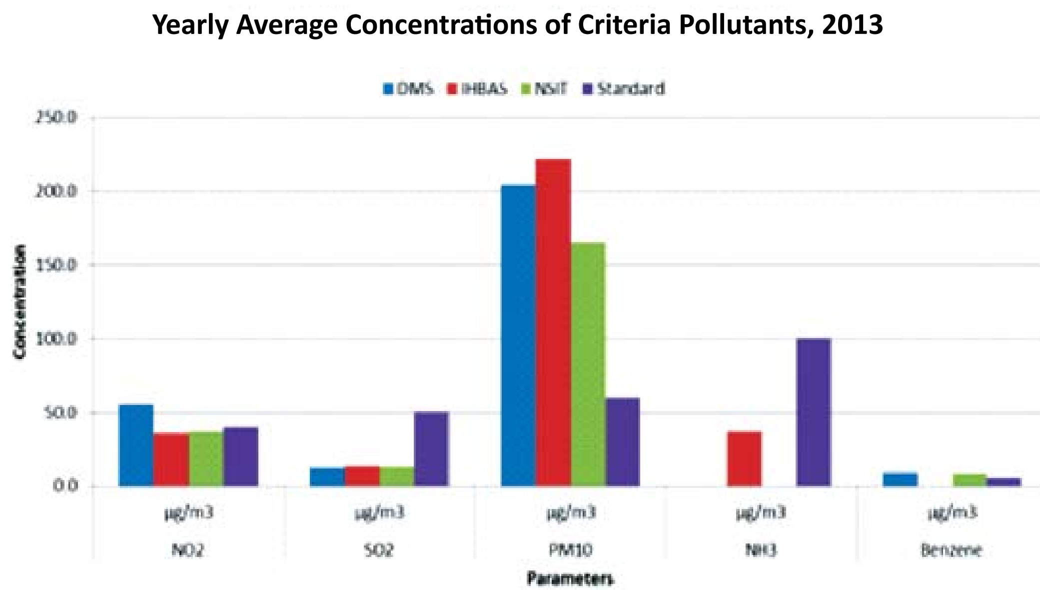


Figure 5.49: Air Quality Status of criteria pollutants monitored at CAAQMS in Delhi 2013

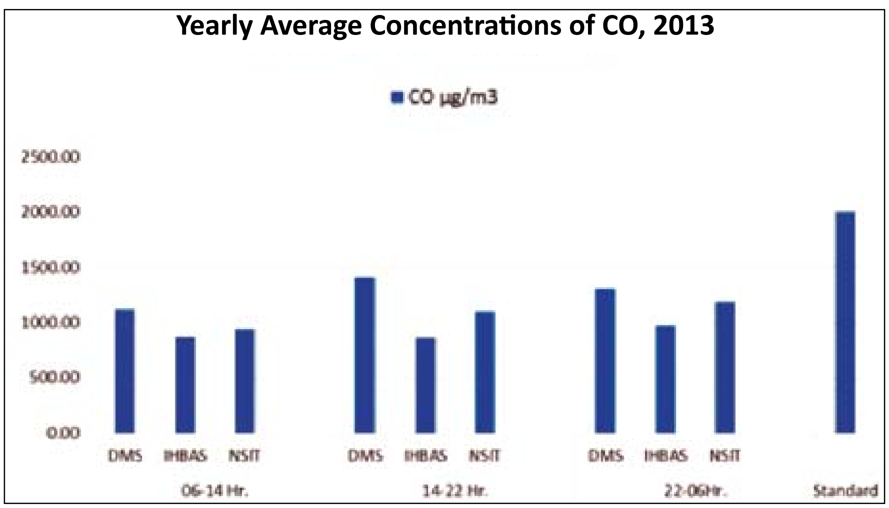


Figure 5.50: Carbon Monoxide in Ambient Air monitored at CAAQMS in Delhi 2013

Ambient air quality monitoring on basis real time is also conducted at two other locations viz. B.S.Z. Marg (I.T.O.) and Delhi Technological University, Bawana for parameter sulphur Dioxide (SO_2), Oxides of Nitrogen (NO, NO_2, NO_x), Carbon Monoxide (CO), Ozone (O_3) and $PM_{2.5}$.

The Integrated continuous ambient air quality monitoring station at Bahadur Shah Zafar Marg traffic intersection monitors the contribution of Rajghat Power House and two gas base power plants besides the large number of vehicles to the air quality.

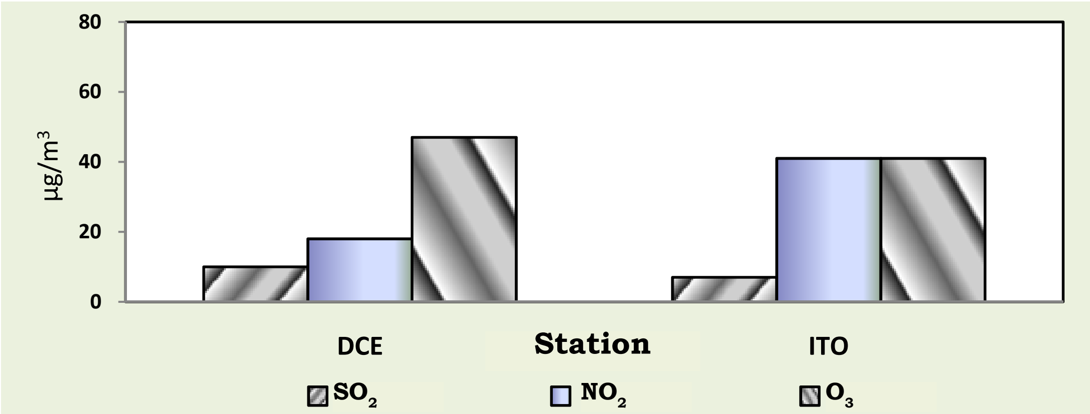


Figure 5.51 : Air Quality Status at DCE & ITO Monitoring Stations during 2013

The air quality monitored during year 2013 at all Continuous Ambient Air Quality Monitoring stations indicate that the annual average concentration and 24 Hrs. Average values of Sulphur Dioxide at DCE and B.S.Z. Marg were lower than the NAAQS of 50 µg/m^3 and 80 µg/m^3 espectively. The annual average concentration of Nitrogen Dioxide at B.S.Z. Marg (41 µg/m^3) was higher than the NAAQS (40 µg/m^3) while at DCE it was well within NAAQS. The 8 hourly average concentration of Carbon Monoxide was 687 µg/m^3 at DCE and 1469 µg/m^3 at ITO. The Carbon Monoxide lavels exceeded the NAAQS 8 hours average value (2000 µg/m^3) at DCE 2% observations. The 8 hourly average concentration of O_3 was 47 µg/m^3 at DCE and 41 µg/m^3 at ITO. The observations exceeded the 8 hours average NAAQS (100 µg/m3) at ITO (5% observations) and DCE (12% observation) the annual average concentration of $PM_{2.5}$ at B.S.Z. Marg was 173 µg/m^3 which was higher than the NAAQS limit of 40 µg/m^3.

5.2.15 Continuous Ambient Air Quality Monitoring in Million-plus Cities, State Capitals, Historical and Religious Places

The Continuous Ambient Air Quality Monitoring (CAAQM) Network is proposed to be expanded to one Million-plus Cities, State Capitals, Historical and Religious Places on 50:50 fund sharing basis between CPCB and concerned SPCBs / PCCs. CAAQMS have already been installed & commissioned in 17 one million plus cities out of the 46 cities. CPCB provided 50% assistance in case of 13 cities while in case of four cities (Delhi, Kolkata, Jaipur and Lucknow), CPCB / SPCB itself acquired the stations. During 2013-14, trinds were released to SPCBs for installation of six CAAQMS one each at Amritsar (01), Nagpur and Nashik (01 each), Howrah (01), Srinagar (01) and Vijayawada (01).

5.2.16 Continuous Ambient Air Quality Monitoring in Critically Polluted Areas (CPAs)

CPCB has identfied 43 industrial areas/clusters in 16 States as critically polluted areas based on CEPI Index, Central Pollution Control Board prepared a comprehensive proposal for establishment of Continuous Air Quality Monitoring Stations (CAAQMS) in 43 cities on cost sharing basis between CPCB & SPCBs / PCCs. The CAAQM Stations are proposed to be installed in two phases. In 1st Phase, 16 CAAQM Stations at Ankleshwar, Vapi, Vatva, Dombivali, Aurangabad, Chandra Pur, Ghaziabad, Noida, Mandi Gobind Garh, Ludhiana, Angul, Jharsuguda, Manali, Coimbatore, Bhiwadi and Asansol are proposed on 50:50 cost sharing basis with concerned SPCB/PCC. The CAAQM Station(s) will be operated by the manufacturer of the station under the supervision of concerned SPCBs and monitoring data will be posted on SPCB/PCC and CPCB websites. 27 CAAQMS covering 27 CPAS are proposed to be established in 2nd phase on, 'Polluter-Pays-Principle (PPP)'.

5.2.17 Ambient Air Quality Monitoring in Lucknow

Ambient Air Quality is monitored twice a week for Air quality parameters PM_{10}, $PM_{2.5}$,SO_2 and NO_2 at Vikas khand, Gomti Nagar, Lucknow (residential area).

Trend of monthly average concentration of air pollutants indicated that SO_2 was below detetion limit most of the time while PM_{205} found increased substantially during Octover - June.

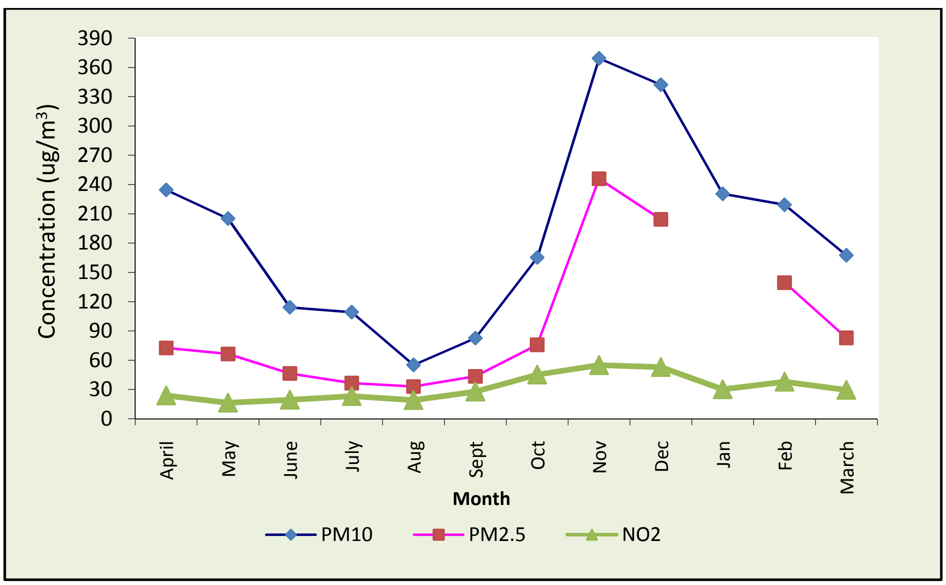


Figure 5.52 : Ambient Air Quality Stations at Lucknow during year 2013-14

5.2.18 Ambient Air & Noise Monitoring at Central Zone

The impact of bursting of fire crackers during deepawali ambient air quality was assessed at three locations i.e. T.T. Nagar, Nehru Nagar and Chhola Road in Bhopal.

Air Quality Monitoring indicated that levels of sulphur Dioxide ranged between-06 to 13 µg/m^3 . Nitrogen Dioxide between 22 to 50µg/m^3. The concentrations of PM_{10}

ranged between 91 to 350 µg/m^3. The concentrations of all the air pollutants viz. SO_2, NO_2 & RSPM (PM_{10}) were found increased on deepawali day as compared to Pre-Diwali (29/10/2013) and Post-Deepawali (04/11/2013) days. The concentration of RSPM increased 3.5 times on Deepawali day.

The Ambient Noise level was monitored at two locations viz T.T. Nagar and Nehru Nagar Bhopal from 18.00 hours to 24.00 hours. The average ambient Leq noise levels ranged between 52.2 to 65.5 dB(A) Leq at Nehru Nagar and from 59.5 to 69.4 dB (A) Leq at T.T. Nagar on normal day while on Deepawali day the noise lavel varied between 66.7 to 110.3 dB (A) Leq at Nehru Nagar and from 70.4 to 77.1 dB (A) Leq at T.T. Nagar, Bhopal. After Deepawali, noise level stabilized to normal level i.e. 64.8 to 78.9 dB (A) Leq at Nehru Nagar 61.7 to 71.7 dB (A) Leq at T.T. Nagar.

Continuous Ambient Air Quality Monitoring (CAAQM) at Lucknow

Three Continuous Ambient Air Quality Monitoring Stations have been set up under the project ”Private Participation in the management of CAAQM stations/network.

Table 5.19: Air Quality Status Monitored by CAAQMS at Lucknow during 2013-2014

Parameters	0	0	0	0	0	0	0	0	0
Nitrogen Monoxide (No) µg/m^3	13.09	19.39	117.28	1.56	4.097	3.02	186.57	141.59	146.82
Nitrogen Dioxide (No_2) µg/m^3	31.45	34.49	44.77	8.61	5.96	10.63	134.25	134.25	137.36
Oxides of Nitrogen (Nox) µg/m^3	27.0	21.96	32.03	10.61	8.201	11.72	153.89	196.86	200.33
Sulphur Dioxide (So_2) µg/m^3	8.39	9.45	6.62	2.94	2.33	1.25	57.1	46.1	46.03
Corbon Monoxide (Co) µg/m^3	243.67	958.4	961.47	68.72	93.27	270.67	1801.34	3432.25	1770.92
Ozone (O_3) µg/m^3	42.25	29.22	-	4.19	2.37	-	93.5	92.28	-
PM_{10} µg/m^3	205.91	170.37	167.17	22.27	50.23	75.45	463.17	500	486.57
Benzene (CCHG) µg/m^3	2.19	8.82	-	0.59	1	-	15.5	75.38	-
Toluene (C_9H_8) µg/m^3	5.21	3.9	-	2.01	1.56	-	50.97	34.1	-
Ethyl benjene µg/m^3	2.48	3.71	-	0.62	1.56	-	14.16	18.02	-

Parameters	0	0	0	0	0	0	0	0	0
M+P-Xylene µg/m³	2.08	2.56	-	0	0.67	-	12.9	27.39	-
O-xylene µg/m³	2.53	4.58	-	0	0.66	-	27.9	69	-
Tempereture ⁰c	28.77	24.72	26.07	3.62	2.87	3.92	36.89	34.91	33.34
Relative Humdity %	64.9	54.75	56.48	35.69	32.25	26	80	62.92	69.19
Wind speed m/s	1.3	5.87	0.94	0	0.28	0.46	4.21	3.87	2.33
Methane µg/m³	-	-	1088.74	-	-	660.3	-	-	1350.52
Non Methane Hydrocarbon µg/m³	-	-	667.94	-	-	168.45	-	-	716.92
Total Hydrocarbon µg/m³	-	-	1824.34	-	-	862.9	-	-	2307.81
Amonia	-	-	18.51	-	-	128	-	-	55.42

5.2.19 Ambient Air & Noise Monitoring at Eastern Zone

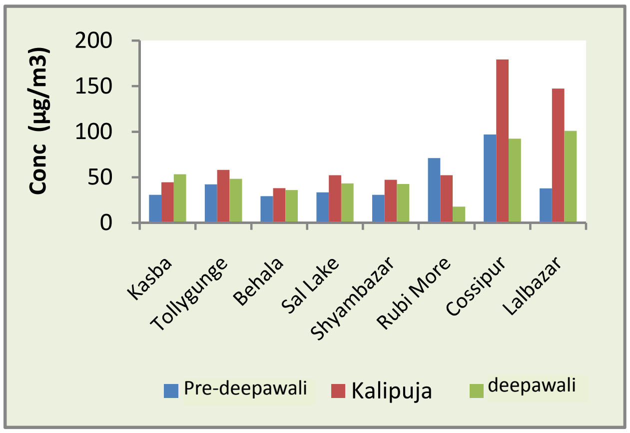
The ambient air quality was monitored at 8 strategic locations and Noise levels monitored at two locations representing different socio-economic, ambient and geographical conditions on pre-Kali Puja day, Kali Puja day and Deepawali day

Table 5.20 : Noise Level on Pre Kali Puja day, Kali Puja day and Deepawali day of Kolkata

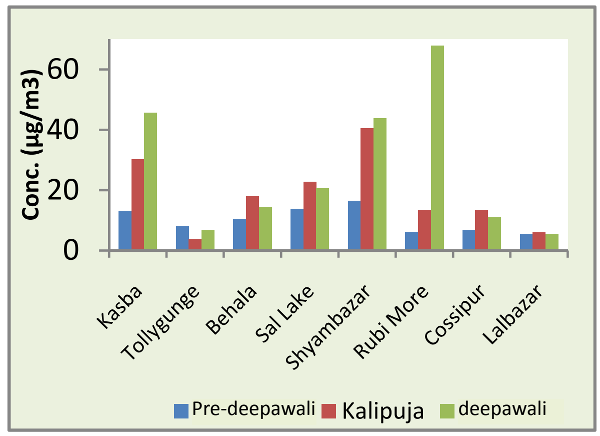
Time Period	Pre-Kalipuja			Kalipuja			Deepawali		
	Leq	Lmin	Lmax	Leq	Lmin	Lmax	Leq	Lmin	Lmax
North Kolkata									
1800 to 1900 hrs	65	53	76	69	53	96	69	52	90
1900 to 2000 hrs	60	53	71	80	52	88	73	52	96
2000 to 2100 hrs	61	53	70	72	54	94	69	52	89
2100 to 2200 hrs	60	53	71	73	55	91	73	52	90
2200 to 2300 hrs	59	52	75	74	53	92	76	52	90
2300 to 2400 hrs	63	52	87	70	52	90	77	55	91
South Kolkata									
1800 to 1900 hrs	64	57	83	69	52	88	66	53	80
1900 to 2000 hrs	61	54	71	63	52	78	68	53	80
2000 to 2100 hrs	60	53	67	61	52	78	71	52	89
2100 to 2200 hrs	60	52	68	63	53	79	64	53	83
2200 to 2300 hrs	58	52	70	63	53	78	60	52	78
2300 to 2400 hrs	60	52	72	65	52	87	61	52	77

Noise levels were high on the Kali Puja day and Deepawali days at both the location indicating busting of high decibal crackers as source of Noise.

The Air quality Status indicated RSPM was high during the night (10pm to 6am) on the Deepawali day. On Kalipuja day, RSPM values observed at Salt lake were at 3565 ug/m³ during the night sulphur dioxide levels recorded were 69.5 and 10.5 ug/m³ at Shyambazar and Kasba respectivly between 10pm to 6am on Deepawali day. High NO_2 levels were observed at Cossipur 259.8 ug/m³ and Lalbazar 311.3 ug/m³ on Kalipuja day. The temporal fluctuations pattern suggested influence of crackers along with low mixing height and low atmospheric temperature.



24 Hr Average Conc. of NO_2 (Deepawali - 2013)



24 Hr Average Conc. of SO_2 (Deepawali - 2013)

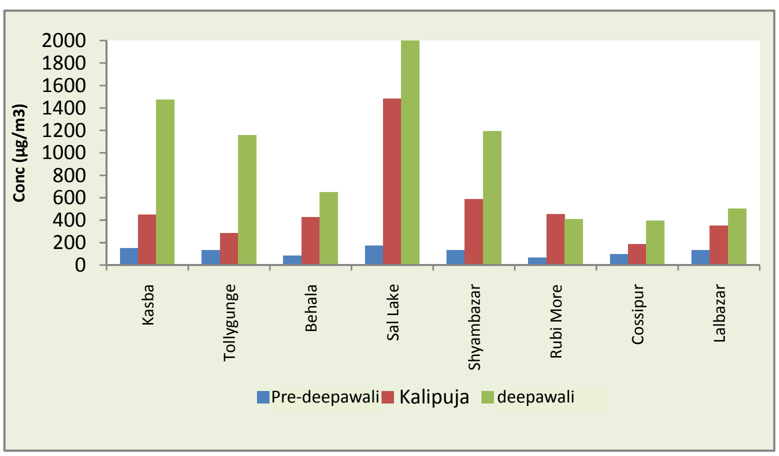


Figure 5.53 : Air Quality Status (SO_2, NO_2, RSPM) at Kolkata during Deepawali 2013

5.2.20 Ambient Air & Noise Monitoring at North Zone

The monitoring of ambient air quality and Noise level was carried out at Indira Nagar & Vikas Khand Lucknow on October 29, 2013 (Pre- Deepawali) and November 03, 2013 (Deepawali day).

The air quality data indicates significant increase in the average concentrations of PM_{10} (68% in Gomti Nagar & 110% in Indira Nagar) the average concentrations of SO_2 (from BDL to 6.6 µg/m³ in Gomti Nagar and BDL to 10.0 µg/m³ in Indira Nagar. The NO_2 concentration was found reduced in comparison to Pre-Deepawali day which may be due to decreased vehicular movement on Deepawali day.

Table 5.21 : Ambient Air Quality during Deepawali 2013

Monitoring Day	SO_2 µg/m³		NO_2 µg/m³		PM_{10} µg/m³	
	Pre-Deepawali	Deepawali Day	Pre-Deepawali	Deepawali Day	Pre-Deepawali	Deepawali Day
Date → Location ↓	29/10/2013	03/11/2013	29/10/2013	03/11/2013	29/10/2013	03/11/2013
A. Indira Nagar	BDL	*10	89.8	87.7	294	617
	BDL	BDL – 33	37 - 166	58 - 157	260 - 325	251 - 820
B. Vikas Khand	BDL	*6.7	75.8	71.3	366	616
	BDL	BDL to 25	33 – 121	25 – 133	351 - 376	292 -751

** NAAQs* SO_2*, - 80 µg/m³; No*$_2$ *80 µg/m³;* PM_{10} *- 100 µg/m³*

Increase in the concentration of SO_2 and NO_2 was observed during year 2013 as compared to 2012 at both the locations. Slight decrese in NO_2 an deepavali day way be due to ten number of vehicles on road in comperisan to pre Deepawali day. No significant variations have been noticed in concentration of PM_{10} during Pre-Deepawali period at both the stations during 2012 and 2013, however PM_{10} was found increased on Deepawali day during both years.

Ambient Noise levels (dBA) monitored (Table-5.22) at Indira Nagar and Gomti Nagar Indicated, increased levels on Deepawali day in comparison to Pre-Deepawali day however, no significant difference was observed in noise level on Deepawali day during year 2012 & 2013.

Table 5.22 : Noise Level during Deepawali, 2013 at Lucknow

Time Duration (Hours)	Pre-Deepawali day (29.10.2013)			Deepawali Day, (03.11.2013)		
	Lmin	Lmax	Leq dB (A)	Lmin	Lmax	Leq dB (A)
Indira Nagar Lucknow						
18:00 to 19:00	48.8	84.5	59.3	47.5	109.9	74.2
19:00 to 20:00	48.6	108.2	72.6	48.6	108.0	77.0
20:00 to 21:00	47.9	89.9	58.6	55.7	111.0	87.2
21:00 to 22:00	47.4	98.8	64.8	59.1	112.1	90.1
22:00 to 23:00	44.5	87.0	56.6	51.8	111.5	82.1
23:00 to 00:00	42.9	82.9	51.0	43.0	102.3	73.7
Vikas Khand, Gomti Nagar, Lucknow						
18:00 to 19:00	47.2	78.1	51.5	48.2	96.6	55.8
19:00 to 20:00	48.6	90.1	49.7	49.4	111.3	65.7

Time Duration (Hours)	Pre-Deepawali day (29.10.2013)			Deepawali Day, (03.11.2013)		
	Lmin	Lmax	Leq dB (A)	Lmin	Lmax	Leq dB (A)
20:00 to 21:00	41.9	93.3	52.2	52.4	107.2	61.5
21:00 to 22:00	47.6	80.6	54.4	56.1	127.9	72.5
22:00 to 23:00	48.5	85.0	50.6	53.6	110.8	56.4
23:00 to 00:00	47.2	81.0	49.0	43.0	103.4	44.2

5.2.21 Ambient Air & Noise Monitoring at Western Zone

The Central Pullution Control Board West Zone Office monitored ambient air quality and Noise lavels at three prominent locations viz. Harinagar (Residential), MS University (Silent) and Fatehgunj (Commercial) in Vadodara during Pre-Deepawali and Deepawali festival.

Table 5.23: Ambient Air quality Status Vadodara during Pre-Deepawali and Deepawali day-2013

Sl. No.	Monitoring Location	Period	Time	RSPM µg/m^3	SO_2 µg/m^3	NOx µg/m^3
1.	Hari Nagar Water tank, Vadodara	Pre-Deepawali 29.10.2013 to 30.10.2013	06.00 AM to 06.00 AM	160.3	BDL	21.46
		Deepawali 3.11.2013 to 4.11.2013	-do-	189	13.76	21.74
2.	Fatehganj circle, Vadodara	Pre-Deepawali 29.10.2013 to 30.10.2013	06.00 AM 3o 06.00 AM	169.4	BDL	26.18
		Deepawali 3.11.2013 to 4.11.2013	-do-	160	3.35	24.93
3.	M.S. University complex, Vadodara	Pre-Deepawali 29.10.2013 to 30.10.2013	06.00 AM to 06.00 AM	125.6	BDL	18.05
		Deepawali 3.11.2013 to 4.11.2013	-do-	97	BDL	20.64

The ambient air quality indicated that RSPM exceeded the NAAQs limits while SO_2 and NO_x have been found well within the standard limits but there has been substantial increase in their conectration on Deepawali day, which may be attributed to bursting of crackers and heavy vehicular movement during the festivel.

The noise level monitored during Pre-Deepawali and Deepawali festival is presented in Table below:

Table 5.24: Noise level monitored at various monitoring location during Pre-Deepawali & Deepawali day at Vadodara

Time period		Pre-Deepawali Day / Normal Day			Deepawali Day		
		Lmin	Lmax	Leq	Lmin	Lmax	Leq
18.00 to 19.00 Hr	A	49.0	73.0	62.9	47.0	69.0	60.2
	B	69.0	80.0	74.9	61.0	77.0	70.2
	C	59.0	78.0	68.8	61.0	85.0	67.9
19.00 to 20.00 Hr	A	49.0	63.0	52.7	52.0	78.0	69.2
	B	67.0	85.0	74.3	60.0	77.0	69.6
	C	54.0	88.0	73.0	60.0	83.0	71.9
20.00 to 21.00 Hr	A	45.0	65.0	57.0	47.0	80.0	69.4
	B	66.0	79.0	72.5	60.0	81.0	75.4
	C	54.0	78.0	62.1	61.0	94.0	78.0
21.00 to 22.00 Hr	A	50.0	73.0	64.7	52.0	89.0	74.0
	B	66.0	77.0	72.2	66.0	86.0	77.4
	C	53.0	78.0	62.2	63.0	89.0	78.2
22.00 to 23.00 Hr	A	53.0	70.0	64.0	58.0	84.0	72.2
	B	64.0	74.0	68.9	60.0	87.0	78.0
	C	53.0	66.0	58.3	65.0	91.0	77.7
23.00 to 24.00 Hr	A	52.0	80.0	68.0	60.0	88.0	74.7
	B	61.0	80.0	68.8	64.0	85.0	76.3
	C	52.0	62.0	57.3	48.0	92.0	81.3

A : MS University B: Fatehganj C: Hari Nagar

High noise level was recorded at all monitored locations on Deepawali day which was exceeded the Noise limits. The Noise Leq values during late evening hours (after 20:00 hrs) on Deepawali day were high at all monitored locations which may be attributed to bursting of crackers.

5.2.22 Ambient Air Quality Monitoring at Agra:

Central Pollution Control Board is monitoring Ambient Air Quality at four identified locations viz. Etmadud daulah, Rambagh, Nunhai and Tajmahal in Agra in compliance to the directives of Hon'ble Supreme Court.

The ambient air quality data indicates that the air pollutant concentration is low at Tajmahal while Nunhai has high air pollution levels being Industrial area. The annual average values of particulate matter (PM_{10}) were in the range of 143µg/m^3 (Tajmahal) to 211µg/m^3 (Nunhai) which is higher than the notified annual average standard of 60µg/m^3 for air quality in sensitive areas. The annual average of SO_2 levels were within the annual average air quality standard of 20 µg/m^3 for sensitive area and ranged between 4µg/m^3 (Tajmahal) to 5µg/m^3 (Nunhai) NO_2 was well below the annual standard value of 30µg/m^3 at all stations except at Nunhai. The SPM values ranged between 255µg/m^3 (Tajmahal) & 432µg/m^3 (Nunhai).

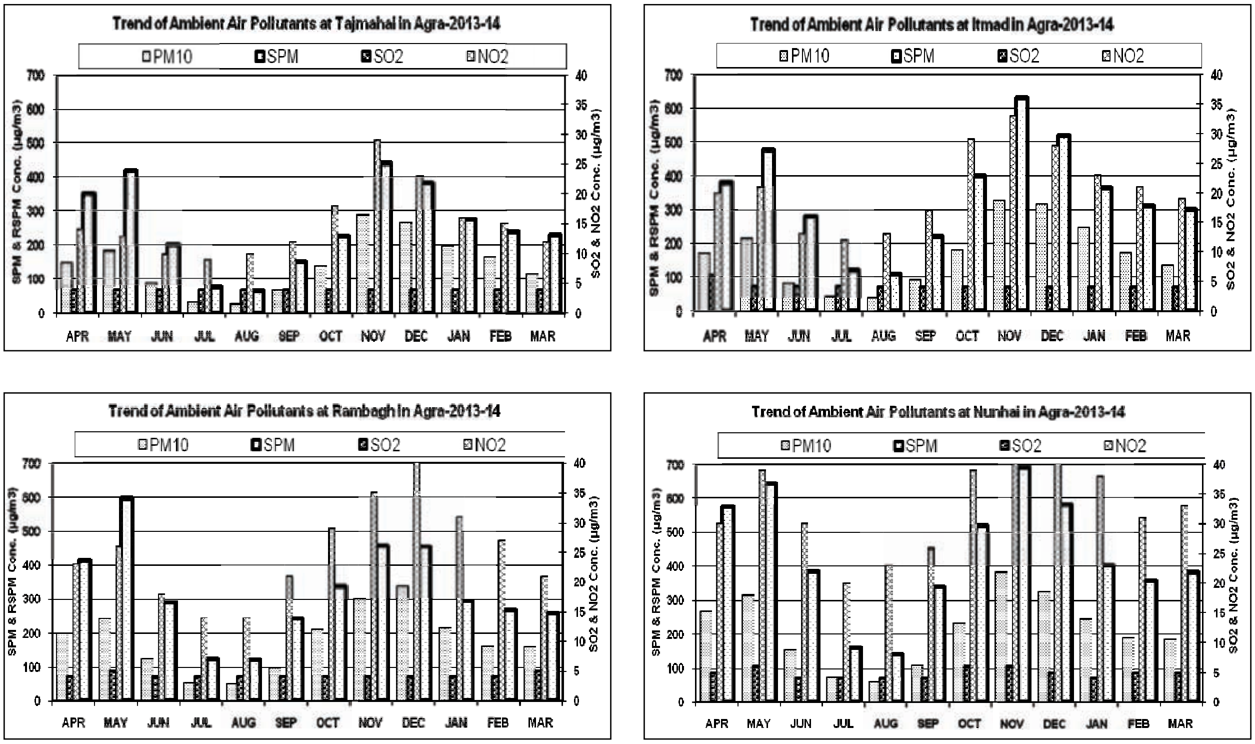


Figure 5.54 : Ambient air quality status of Agra during 2013

Trend of Coarse Particulate Fraction (PM_{100} -PM_{10}) at Agra:

Non-respirable Suspended Particulate matter are the particles in size range between 10 µg/m^3 -100 µg/m^3 (NRSPM ≈ SPM-PM_{10}) and ratio of SPM/PM_{10} was calculated based on Air quality monitoring conducted during 2013-14 at Agra. The lowest values of NRSPM were recorded at Tajmahal and highest at Nunhai. The high values of NRSPM during summer at all monitoring stations may be due to transport of coarser particles.

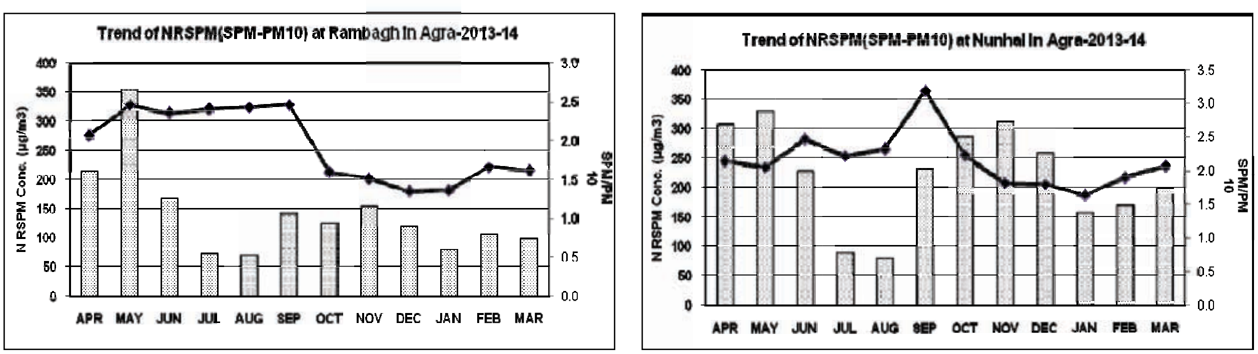


Figure 5.55 : Trend of Non – Respirable particle matter at Nunhai, Agra during 2013-2014

$PM_{2.5}$ Profile at Tajmahal in Agra:

Central Pollution Control Board conducted air quality monitoring with respect to $PM_{2.5}$ at Agra which indicated that monthly average value of $PM_{2.5}$ was higher during winter and lower during summer and monsoon months. High values of Fine particulate matter may be attributed to calm weather conditions (low atmospheric mixing heights) during winter months. The size fraction of particulate matter monitored at Agra are presented in Figure-5.56.

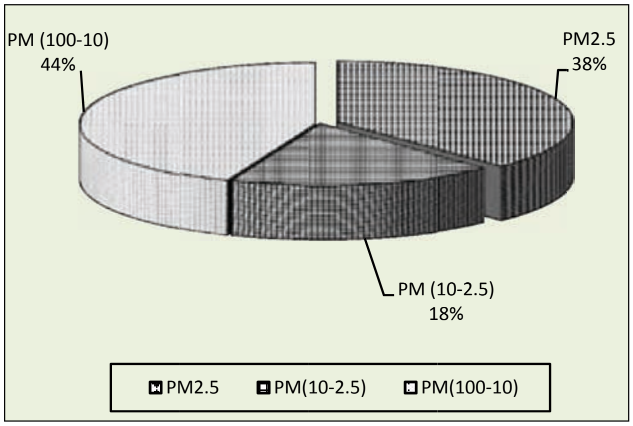


Figure 5.56 : Particulate Matter size fraction in ambient air monitored in Agra during 2013-14

Air Quality Trend in Agra

Central Pollution Control Board is monitoring ambient air quality at 04 location viz. Tajmahal, Etmad-ud-daulah, Rambagh and Nunhai since 2002. At Tajmahal protected Monument, there has been declining trend in suspended particulers matter but PM_{10} was found increasing. The SO_2 and NO_2 remained almost static through out the year with little variation.

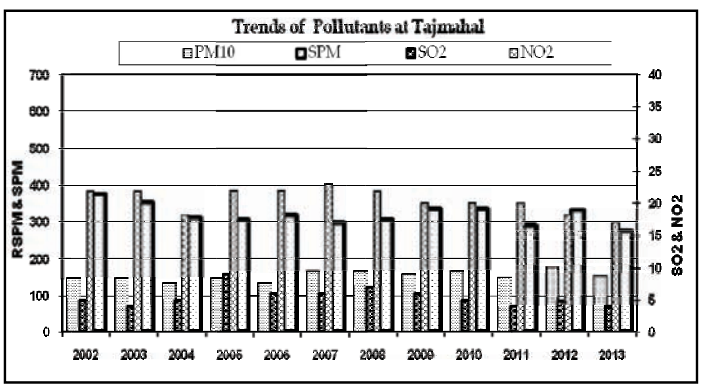


Figure 5.57 : Annual Trend of Air Pollutants at Tajmahal, Agra between 2002 to 2013

Air Quality Monitoring during Deepawali, Agra:

Air quality monitoring conducted at Agra during Pre-Deepawali and Deepawali indicated that Sulphur dioxide concentration was elevated at Etmad-ud-daulah and Tajmahal locations on Deepawali day (3rd Nov 2013) as compared in Pre-Deepawali day.

Nitrogen dioxide concentration on Deepawali day was found (27µg/m^3) reduced at Etmad-ud-daulah in comparison to Pre-Deepawali day (34µg/m^3); while at Tajmahal station the values musibred from 25 µg/m³ (Pre-Deepawali to 31µg/m³ (Deepawali day) but was within the NAAQS limit.

PM_{10} level was also found elevated at Etmad-ud-daulah and Tajmahal monitoring locations on Deepawali day in comparison to Pre-Deepawali day.

Table 5.25. : Air quality status on Deepawali and Pre-Deepawali day at Agra during 2013

Date	Monitoring Location	SO_2 (µg/m³)	NO_2 (µg/m³)	PM_{10} (µg/m³)
Pre Deepawali 29-10-2013	Tajmahal	BDL	25	364
	Etmad-ud-daulah	BDL	34	406
Deepawali 3-11-2013	Tajmahal	04	31	524
	Etmad-ud-daulah	05	27	697

The noise monitoring at Kamala Nagar residential area indicated elevated noise level from Leq 58.2 dB(A) on Pre Deepawali day to 77.0 dBA on Deepawali day.

Table 5.26. : Noise level during Deepawali day and Pre-Deepawali day at Agra, 2013

Time Duration	Pre-Deepawali Day 29.10.2013			Deepawali Day 03.11.2013		
	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 hrs	37.5	128.7	67.8	43.1	112.5	65.1
19:00 to 20:00 hrs	46.4	116.5	64.4	47.8	122.7	69.6
20:00 to 21:00 hrs	44.1	107.7	57.8	49.4	129.8	81.6
21:00 to 22:00 hrs	44.8	64.9	47.7	56.0	128.7	84.1
22:00 to 23:00 hrs	45.0	79.0	48.0	52.7	126.8	79.0
23:00 to 24:00 hrs	44.5	124.6	63.2	45.1	129.1	82.4

5.2.23 Compansion of Air Quality Trends in Lucknow and Agra city:

The Ambient air Quality data for the period April 2011 to Dec. 2013 of Agra and Lucknow was compared to understand comparative pollutant level in two cities and prevailing trend of air quality

The comparison of air quality data indicated that the concentration of PM_{10} was higher at Lucknow than at Tajmahal, Agra but lower than Nunhat, Agra. Similar pattern in PM_{10} level was observed both at Agra and Lucknow except in the month of March & April. PM_{10} level increased faster at Lucknow than in Agra and at both places the PM_{10} levels exceeded the NAAQS (60 µg/m³).

The average value of NO_2 was much lower at Tajmahal and well with NAAQs at Agra than at Lucknow.

NO_2 followed similar pattern at both places except during the months of May-July.

Ionic Profile of Particulate Matter:

The ambient aerosol concentration patterns may be derived from chemically rich aerosol mixture arising from the multiplicity of air polluting sources, each contributing particulates of specific chemical composition The primary aerosol chemical composition is further transformed by addition of secondary species during atmospheric transport. The chemical profile analysis of Particulate Matter was undertaken at five Air quality Monitoring Stations in Agra viz. Tajmahal, Etomad-ud-daullah, Rambagh and Nunhai to assess composition of various ionic metallic component and to characterize chemical composition of RSPM (PM_{10}).

The profile and relative abundance of various cations & Anions in decreasing order is as below:

Anions : $SO_4^{--} > NO_3^{-} > Cl^{-} > PO_4^{---} > F^{-}$
Cations : $Na^{+} > NH_4^{+} > Ca^{++} > K^{+} > Mg^{++}$

Elemental analysis of ambient particulate matter ($PM_{2.5}$) was undertaken and 41 elements identified on EXRF in the samples collected. Total elemental concentration in samples was found within the range of 3.02-11.51µg/m^3. The average value of sulphur was maximum (3.438µg/m^3) and chromium minimum (0.003µg/m^3).

Benzene, Toluene & Xylene (BTX) Profile-Agra

Benzene, Toluene and Xyleme (BTX) was monitored at Agra continu as air quality monitoring station located on MG Road Traffic intersection by UPPCB with support from Central Pollution Control Board. The air quality data indicated benzene levels between 0.05µg/m^3 - 1.04µg/m^3 with annual average 0.61 µg/m^3. The level of toluene varied between 0.10µg/m^3 – 5.58µg/m^3 with annual average 3.03µg/m^3 and xylene ranged between 0.14µg/m^3 – 1.84µg/m^3 with annual average 0.89µg/m^3.

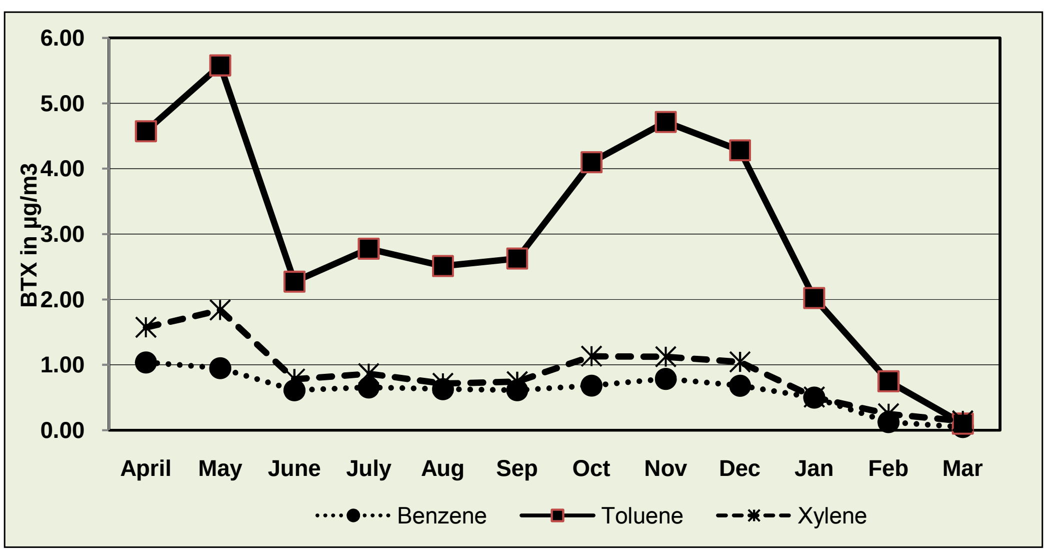


Figure 5.58 : Trend of Benzene, Toluene and xylene at Agra during 2013-14

5.2.24 Study on Absorption Efficiency during measurement of Gaseous pollutants:

The air pollutants such on SO_2 and NO_2 are absorbed in the obsorbing solutions from anbient air at the low rase of 100 LPM. Central Pollution Control Bord conducted a study to assess absorption efficiency of gaseous pollutants at different flow rates and the impact on concentration of gaseous pollutants. The flow rate was reduced by 50% for absorption of NO_2 & SO_2 gases and 1LPM & 0.5 LPM flow rate was maintained for comparison.

The SO_2 monitored during the study was almost BDL, so no conclusion about collection efficiency based on different flow rates could be determined.

For NO_2, it was found that in 75% cases, the concentration of NO_2 increases when the flow rate was lowered i.e. from 1.0 LPM to 0.5 LPM. The increase in NO_2 concentration was found varying between 8% to 102% with average increase of 32%. The variationin in NO_2 concentation may be attributed to the retention time/ contact time of the gases with absorbing media.

5.2.25 Study of Hazardous Air Pollutions (HAPs) in critically polluted Industrial Area, Manali, Tamil Nadu

Central Pollution Control Board zonal office – Banglore condected a study the shidy on Hazarding Air Pollutants VOCs, PAHs, pesticids in the critically polluted Industrial Area, Manali, Tamil Nadu.

The VOC samples in Ambient Air were collected using tanex tubes at three different locations around Manali industrial Area viz. 1) Top of the First Aid Centre (M/s Indian Additives limited-Manali) up wind direction. 2) Top of the M/s CPCL Ambient Air station (Middle of Indl Area) and 3) Top of the(M/s MPL R&D centre) Down wind direction. VOCs were incostired using USEPA method TO17 with GC-MS-ATD. The VOC levels at all three locations were found below detection limit (Detection limt 5 $\mu g/m^3$).

5.2.26 Chemical characterization of ambient particulate matter for Poly Aromatic Hydrocarbon (PAH), Anions & Cations

Central Pollution Contol Board zonal office-Banglore conducted a study for chemical charecterisation of ambient particulate matter with respect to PAH, anions and cations and to identify sources of pollution in Northern suburb of Chennai viz. Manali, Thiruvottiyur and Kathivakkam.

PAHs were analyzed on Gas Chromatograph with Flame Ionisation Detector (FID). Five PAHs viz. Benzo (b) Fluranthene, Benzo (a) Pyrene, Dibenzo (a,h) pyrene, indenopyrene, Benzo (ghi) pyrene have been identified of which Benzo (a) Pyrene was present at higher concentration than the NAAQS in Study area. Higher concentration of all the PAHs was prevalent during the winter season at all the locations. The industrial emissions due to combustion of fossil fuel and vehicular Traffic have been identified as major sources of PAHs in ambient particulate matter.

Clean up and sample enrichment

5.2.27 Ambient Air Quality Monitoring at Bengaluru and Chennai

At Bengaluru and Chennai six continous Ambient Air Quality Monitoring Stations have been established as part of CAAQMs network in the country. These monitoring stations are equipped with various analysers capable to continuosly monitor air quality parameters, have multipoint calibrators by which each analyser can be calibrated as and when required. The average data capture rate in Bengaluru and Chennai has been 79.9% and 63.5% respectively during 2013. These monitoring stations disseminate online data through digital display boards to general public to understand the pollution status at any point of time at respective monitoring site.

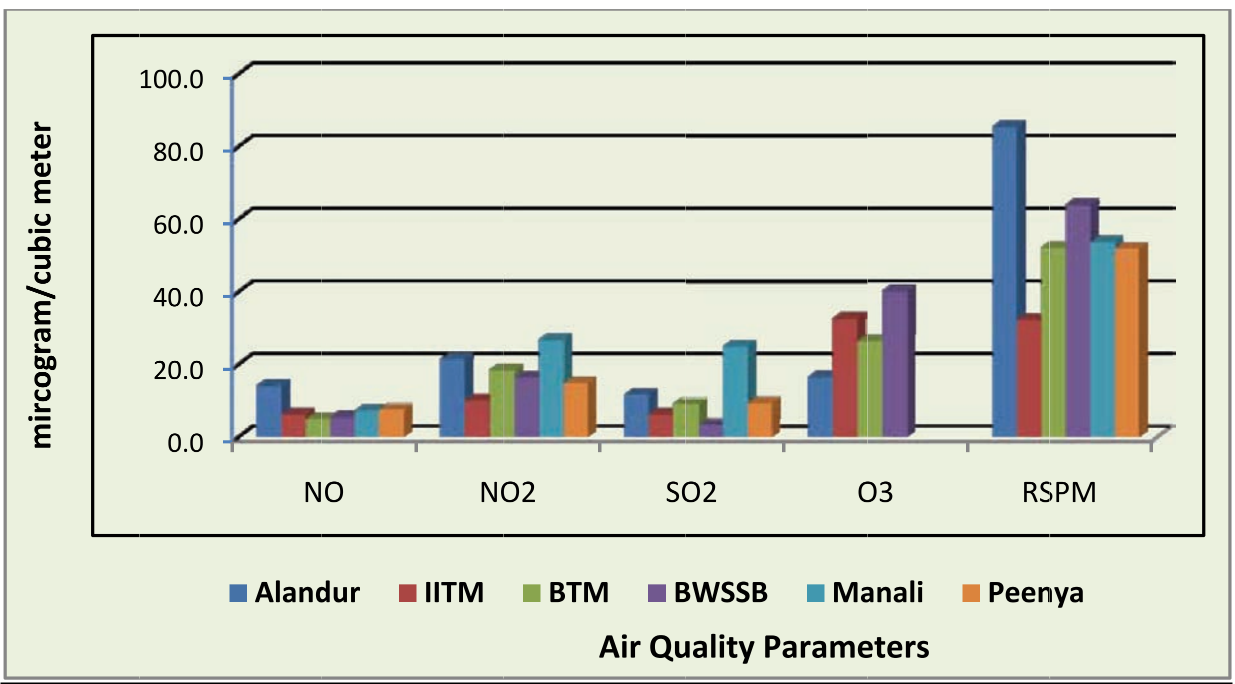


Figure 5.59 : Air Quality Status in Bengaluru and Chennai during 2013

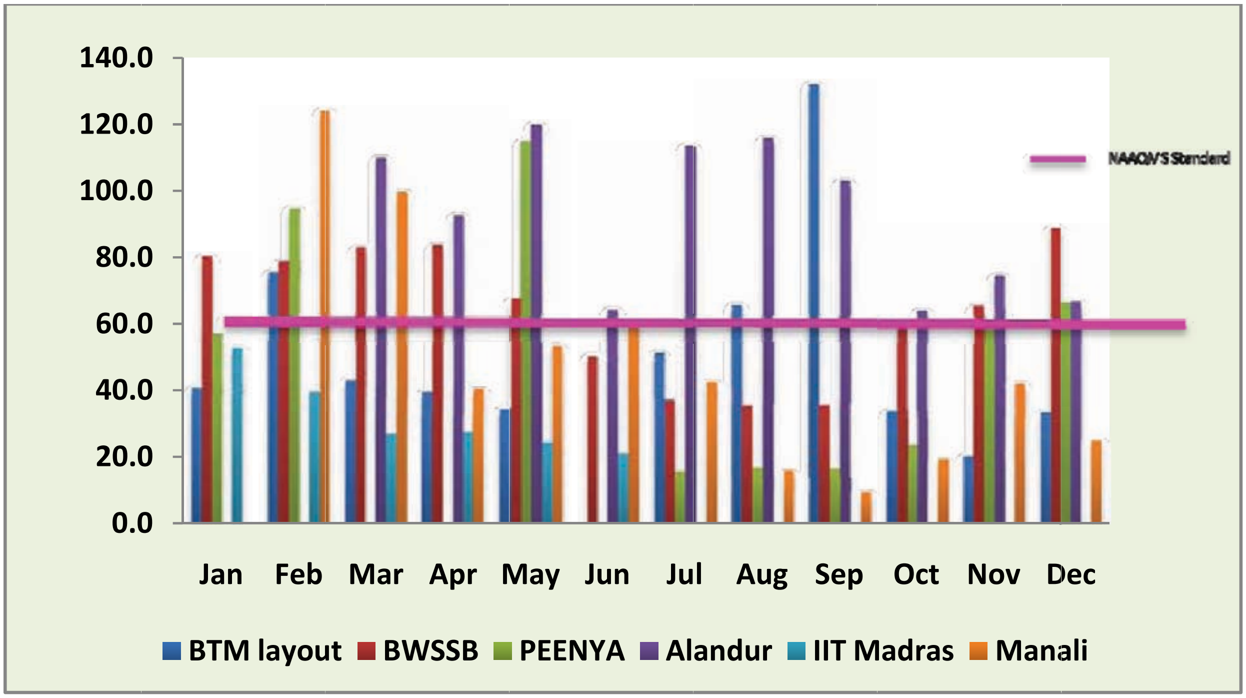


Figure 5.60 : Trend of RSPM in ambient air at CAAQMs, Bengaluru and Chennai

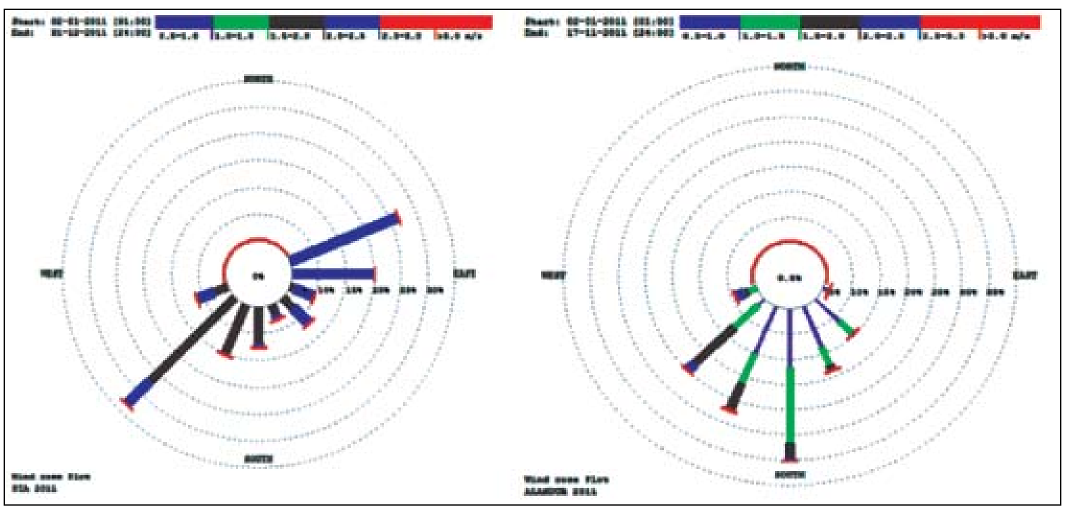


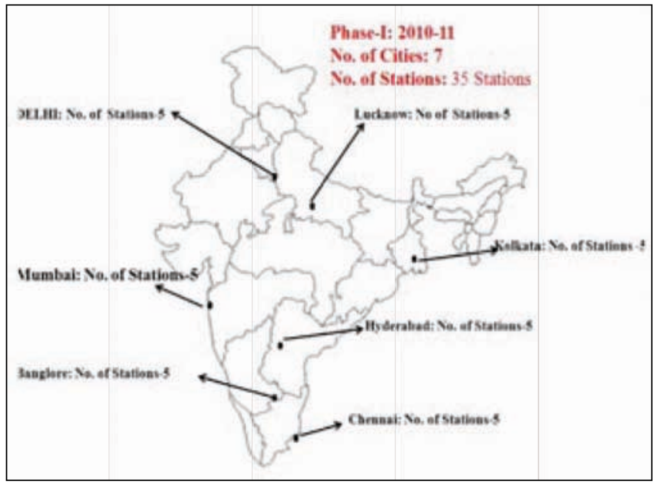
Figure 5.61 : Windrose ot Peenya industrial estate, Bengaluru and Alandur, Chennai

5.3 NATIONAL AMBIENT NOISE MONITORING (NANM) PROGRAMME

Noise is undesirable sound generated from various indoor and outdoor sources such as industries, transport vehicles, construction activities generator sets, fire crackers etc. Noise Pollution (Regulation and Control) Rules, 2000 have been notified under the Environment (Protection) Act 1986 by MOEF&CC and amended during January 2010. The National Environment Policy (NEP)-2006 emphasized under sec. 5.2.8

that Ambient Noise be included as environmental quality parameter and it should be monitored at urban areas regularly.

Ambient Noise Monitoring Network



Central Pollution Control Board in association with State Pollution Control Boards has established National Ambient Noise Monitoring Network by installation of 05 real time noise monitoring systems in each of the seven metropolitan cities namely Delhi, Mumbai, Kolkata, Hyderabad, Bangaluru, Chennai and Lucknow spread over 6 States (Maharashtra, West Bengal, Andhra Pradesh, Karnataka, Tamil Nadu, Uttar Pradesh and NCT-Delhi) in 2011.

Table 5.27 : Category wise Noise Monitoring stations under Ambient Noise Monitoring Network

Category/Zone	No. Of Manteing Stations	Cities covered
Silence	10	Chennai (1), Hyderabad(1), Kolkata (1), Delhi (3), Mumbai (2) & Lucknow (2)
Residential	06	Bengaluru (2), Chennai (1), Hyderabad (1), Kolkata (1) Lucknow (1)
Commercial	14	Bengaluru(2), Chennai (2), Hyderabad(2), Kolkata(2), Delhi(2), Mumbai (3) Lucknow(1)
Industrial	05	Bengaluru(1), Chennai (1), Hyderabad(1), Kolkata(1) Lucknow(1)
Total	**35**	

Remark: Figures in Parenthesis indicate no. of Monitoring locations

Ambient Noise Monitoring is undertaken in Real Time mode and Noise level data is captured and transfered to Central Receiving Station at CPCB, Head Quarter, Delhi and also displayed at CPCB website.

Action Taken:

The concerned States and State Pollution Control Boards have been provided Noise level data and requested to mitiate remedial measures to control Noise Pollution as per Noise Rules, 2000.

Press Release on Noise Pollution Level is issued every year on the occasion of Deepawali for mass awareness.

Noise level Data is made availabel on public demand as well as disseminated on CPCB website.

Table 5.28 : Ambient Noise levels in 07 Metropolitan Cities during 2013

Sl. No.	City	Mauteing Location	Noise Limit dB(A) Leq		Noise level dB(A) Leq	
			Day	Night	Day	Night
1	Bengaluru	Parisar Bhawan (C)	65	55	65	57
		Peeniya (I)	75	70	58	53
		Nisarga Bhawan (R)	55	45	56	48
		Marathali (C)	65	55	57	54
		BTM (R)	55	45	66	56
2.	Chennai	Eye Hospital (S)	50	40	64	53
		T.Nagar(c)	65	55	74	64
		Perambur (C)	65	55	68	57
		Guindy (I)	75	70	75	71
		Triplicane (R)	55	45	68	56
3.	Delhi	Dilshad Garden (S)	50	40	51	49
		CPCB (C)	65	55	63	53
		DCE (S)	50	40	52	49
		ITO (C)	65	55	74	73
		NSIT (S)	50	40	56	53
4.	Hyderabad	Abits (C)	65	55	72	64
		Punjagutta (C)	65	55	76	71
		Jeedimetla (I)	75	70	63	56
		Zoo (S)	50	40	54	49
		Jublee Hills (R)	55	45	56	49
5.	Kolkata	SSKM Hospital (S)	50	40	62	57
		Gole Park (I)	75	70	68	64
		Head Quarter (C)	65	55	62	55
		Patauli (R)	55	45	55	48
		New Market (C)	65	55	68	60
6.	Lucknow	Talkatora (I)	75	70	63	56
		Hajrat Gunj (C)	65	55	72	62
		P.G.I. (S)	50	40	60	53
		Indira Nagar (R)	55	45	54	48
		(S)	50	40	66	57
7.	Mumbai	Thane (C)	65	55	62	55
		Vashi Hospital (S)	50	40	69	57
		Ashp (S)	50	40	65	60
		Bandra (C)	65	55	69	67
		Mumbai, MPCB, Head Qarter (C)	65	55	68	65

Delhi noise level is exceeding the prescribed standards at all stations except CPCB, H.Qs.

In Lucknow noise level is exceeding the noise standards at all stations except at Talkatora for both day time and night time and at Indira Nagar for day time.

In Kolkata noise level is exceeding noise standards at SSKM Hospital & New Market during day & night time and at Patauli during night time. Noise levels at other monitoring location are within the prescribed limits.

In Mumbai Noise levels exceeded the Noise standards at all locations except at Thane MCO.

In Hyderabad noise levels are exceeding the prescribed standards at all the locations except at Jeedimetla Monitoring location.

In Chennai Noise levels exceed the Noise standards at all the location except at Guindy monitoring location during night time .

In Bengaluru Noise levels exceed the Noise standards at BTM and Nisarga Bhawan during day and night time and at Parisar Bhawan during night time.

5.4 REAL TIME EMISSION MONITORING NETWORK AT CENTRAL POLLUTION CONTROL BOARD

Central Pollution Control Board, State Pollution Control Boards, Pollution Control Committees and various industrial units are operating Continuous Ambient Air/ Water Quality Monitoring Stations and Continuous Emission Monitoring Systems (CAAQMS & CEMS) as per directions/guidelines of MoEF/CPCB. Ambient noise levels and effluents discharged from Effluent Treatment Plants are monitored on continuous basis. A system for collating online data on real time basis and its dissemination to all stakeholders is progressively strengthened by Central Pollution Control Board.

The Installation and operation of Real-time air/ water/ emission/ effluent/ noise monitoring systems is a challenging task. Most of the instrumentation used in monitoring are imported and operating software is patented by foreign organizations. The instrumental system operates on different principles and is operated through exclusive software provided.

With heterogenity in the online monitoring system the Central Pollution Control Board has to withstand challenge in accepting the systems manufactured and supplied by manufacturers World over.

The major online instruments suppliers have been advised to install their central data processing systems at CPCB (Total 08 systems) to process and disseminate real time data (on their own web portals) along-with online remote calibration and verification procedures. The network architecture of the model is presented in Fig.

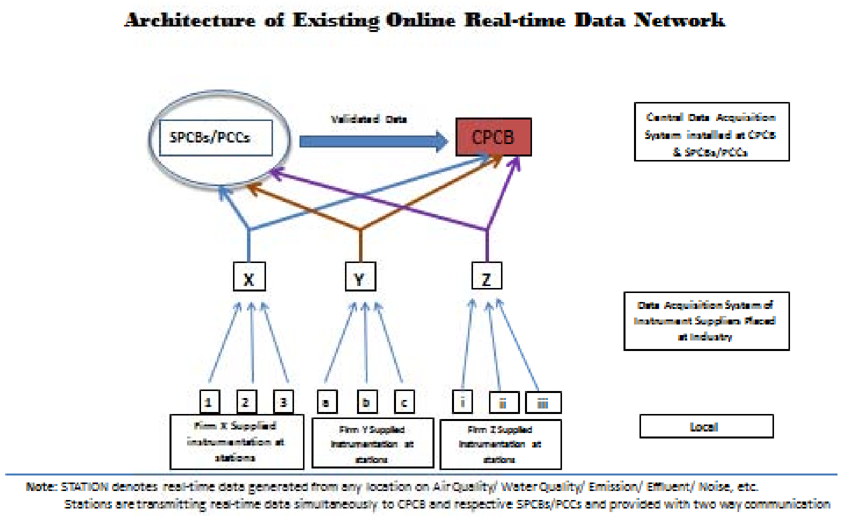
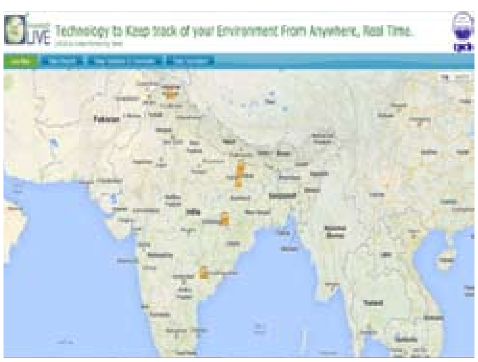


Figure 5.62 : Architecture of Existing Online Real-time Data Network

The industrial unit is also provided online access to view its own environmental data submitted to the Board and provide its comments on the basis of actual environmental conditions.



CPCB & Envirotech Live Portal

CPCB & Environment SA France Portal

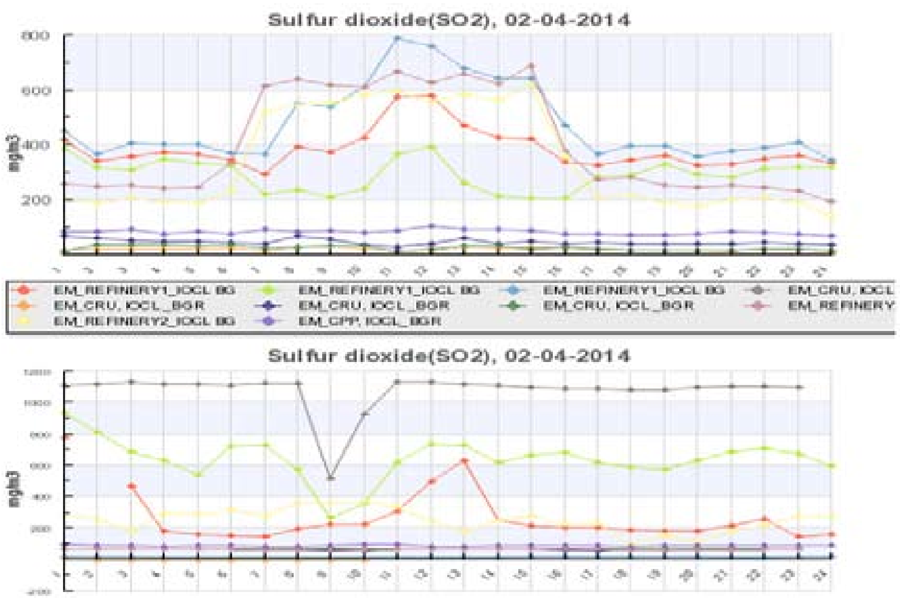
CPCB & Thermo Fisher Portal

CPCB & Swan Portal

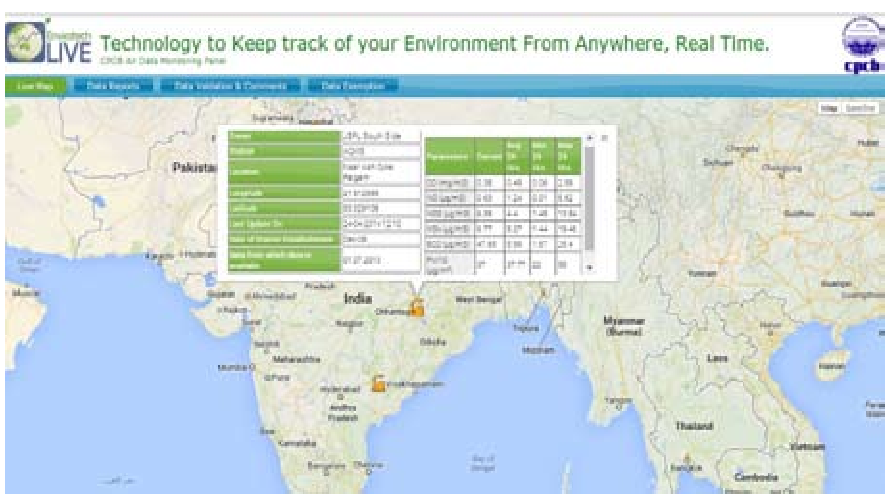
Figure 5.63 : Data display at Web portals by various suppliers of online monitoring systems

The existing model of real-time data network has provided following capabilities:

1. **National Database**: Real-time validated database generated in the country will be one of the Decision Supporting Systems (DSS) for policy decisions for abatement of pollution.
2. **Real time Data View**: Real time pollution levels of emissions/ ambient / effluents in any industrial unit/ at a station could be accessed from any place at any point of time through Internet. The snapstory of report generation is presented in Figures below:



Fugure 5.64 : Report general board on real time data monitored



Fugure 5.65 : Real time Data Presentation and Dissemination

3. **Ease In data submission:** Systematic data collection & database generation procedure (*without any human intervention*) adopted for long/short term planning. Hence, no physical data submission is required.

4. **Responsibility Sharing:** The responsibility of data generation, validation & its real time transmission is on the data generator or the data custodian. The industrial representatives or SPCBs officials are the nodal persons.
5. **Data modification/validation:** Original (raw) data & Modified (validated) data (validated only through regulatory bodies i.e. SPCB/CPCB within a time period) are stored in databases along-with details of the officials involved in validation along with date & time stampings.
6. **Additional Data for validation:** Information on diagnostics – health of instruments, calibration and other supporting/ supplementary data also collected online. This information will enable proper validation of the data on pollution levels.
7. **System Auditing:** Remote calibration procedure to audit the instruments' status and current pollution levels online to ensure the reliability of data produced.
8. **Tamper proof:** Minimized human intervention guarantees submission of tamper-proof real time validated data. The regulatory checks in the form of snap shots and video recordings are also planned for implementation in future.

All the firms associated with CPCB are either providing the desired capabilities or in the process of developing the software under the guidance of Central Pollution Control Board. Twenty one (21) CAAQM Stations operated by CPCB/PCCs/SPCBs and one hundred and seventy one (171) CAAQMS operating in industrial/institutional sectors has alredy networked by CPCB. In addition, one hundred and twenty five (125) CEMS installed at industrial units are also included in the network. The industrial sectors such as cement, oil refineries, steel plants, and power plants coming under 17 categories of Industries are sharing the environmental data.

5.5 ENVIRONMENTAL DATA BANK (EDB)

Web-enabled Environmental Data Bank has been set up at Central Pollution Control Board to facilitate online entry and quick retrieval of data on various environmental parameters. On-line entry for data on air quality under National Air Monitoring Programme and Water Quality Monitoring Programme under GEMS/MINARS is being undertaken regularly by SPCBs/PCCs.

EDB can be accessed through CPCB's website (http://cpcb.nic.in) and raw data as well as processed data could be viewed, downloaded & used for various analysis/ interpretation.

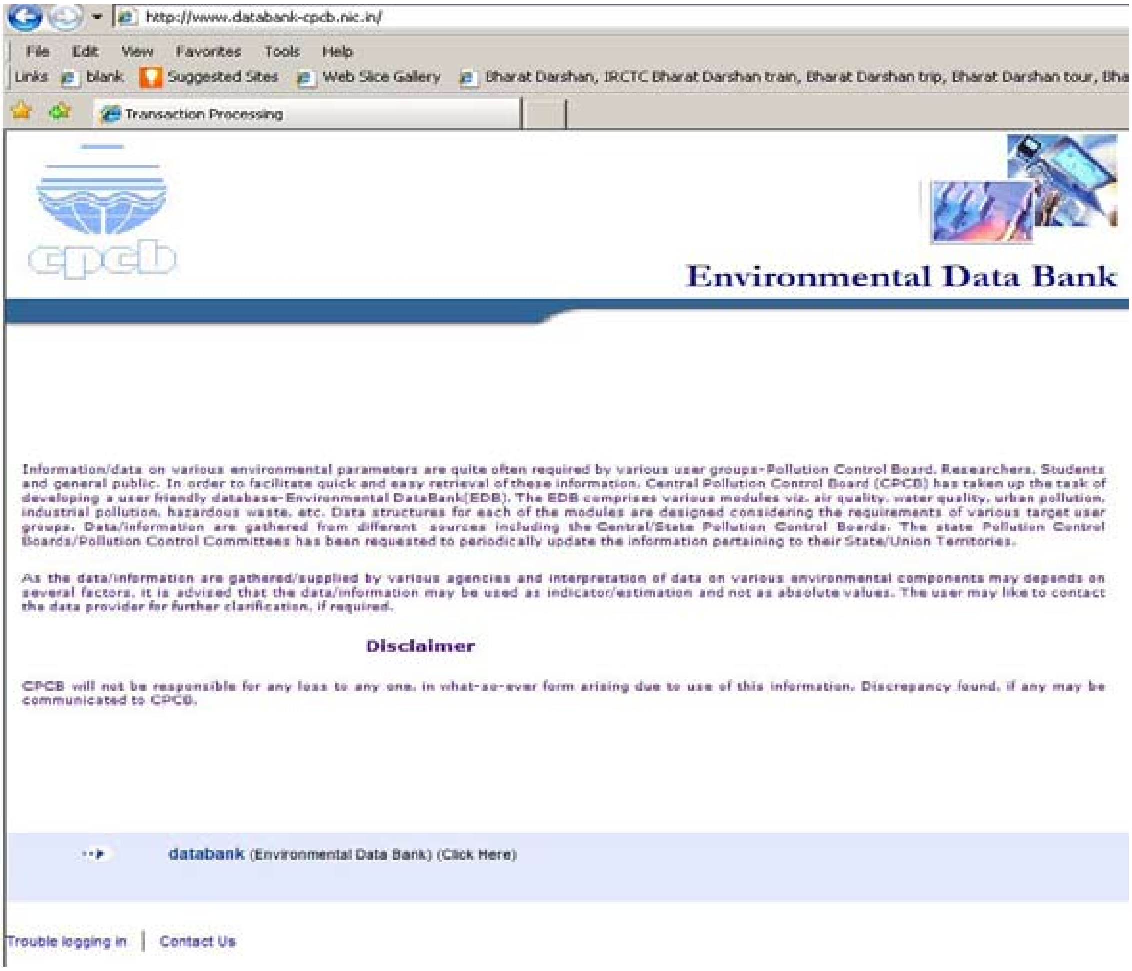


Figure 5.66 : Web page of Environmental data Bank of Central Pollution Control Board

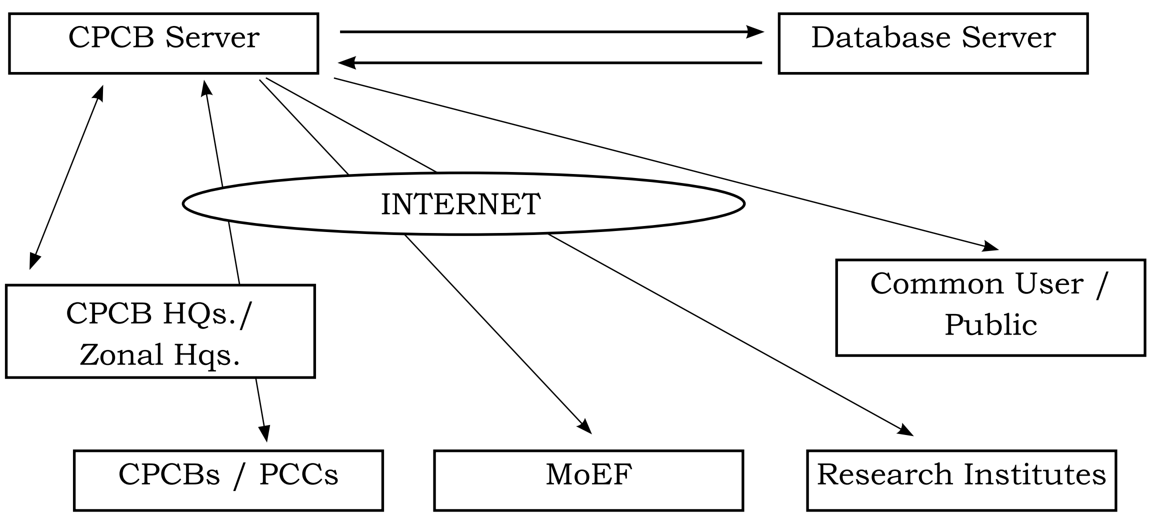
EDB application has been installed into CPCB server with online Internet. The application is served through Web server on which complete application is installed and other database server used to store environmental data. Web server is directly connected to Real IP and cross connected to data base server. The SPCBs/PCCs (predefined users) login on this server to enter data or to view data online through internet. The report with text and graph forms are also available on EDB and can be accessed depending on users operational right.

EDB software Features:

The EDB softwere has following important features for data integration and use.

Validity check: Check command that check uploaded data based on lower and upper level limits specific to each station code. Validity check, any check that some entity respects the constraints applying to that entity. For elaboration when the value of a data item is input by a program, a validity check is normally performed to ensure that this value must be within the acceptable range. Data validation ensures and guarantees to application that every data entered value is correct and accurate.

- Data can be imported and exported from/to excel files. Import/Export feature is using for uploading of lagre amounts of data into database and its convenment retrieval.
- The data which is not within the acceptable range is rejected by the application software and trans located in a separate folder at web server. Accepted data exported automatically to database of EDB through scheduler, which is in public domain.



CHAPTER VI

PRESENT STATE OF ENVIRONMENT, ENVIRONMENTAL PROBLEMS AND COUNTER MEASURES

6.1 VEHICULAR POLLUTION ABATEMENT

A) Development of guidelines for the Environmentally sound Recycling / disposal of ELVs (End of Life Vehicles)

CPCB has initiated studies on developing guidelines for environmentally sound ELV's. The project shall assess different End of Life vehicles through Inventorization and Categorization of vehicles available with various stakeholders.

B) Vehicular pollution studies in Haridwar & Mussorie

A study on "Assessment of vehicular pollution problems and development of air quality management plan in religious (Haridwar) & tourist (Mussorie) places" was taken up in collaboration with Pollution Control Research Institute (PCRI), BHEL, Haridwar. The study has been completed and has also covered Kumbh Mela held in Haridwar during Jan-April 2010. The study report has been published.

C) Pollution from vehicular transport in six cities

This study was awarded to TERI during 2011. The study involves Development of emission inventory of vehicular sources in six mega cities namely Hyderabad, Kolkata, Ahemdabad, Patna, Lucknow & Sholapur during first phase. The study envisages estimation of total vehicular emission loads (both tail pipe as well as evaporative emissions) and estimation of contribution of different categories (2 wheelers, 3-wheelers & 4 wheelers like cars, LCV, HCV, etc.) of vehicles towards total vehicular emission load and identification of vehicle category contributing most towards total emission load from vehicles. More cities are likely to be covered in the next phase. The final report has been received, the city specific action plans for controlling pollution from the transport sector proposed are under finalization.

D) Auditing of Authorized Vehicular Pollution Checking Centers (PCCs) in Delhi

Central Pollution Control Board (CPCB) Delhi inspected total 71 nos. of authorized Pollution Checking Centers (PCCs) spread over nine zones in Delhi (East, North-East, Central, New Delhi, South, South-West, West, North-West, North), authorized by Department of Transport, Govt. of Delhi during the year 2013-14 (07.01.2014 to 11.02.2014), with the following objectives:

1) To check the operation, calibration and preventive maintenance of vehicular emission measuring instruments including infrastructure facility, available at PCCs.
2) To assess the technical skill of PCC operator / authorized signatory.
3) To verify the testing facilities, available as per new PUC norms.
4) To check the code of practice followed and availability of certificates at PCCs (Type approval of testing instruments, latest calibration certificates, training to operator).

Based on observation following recommendations were made

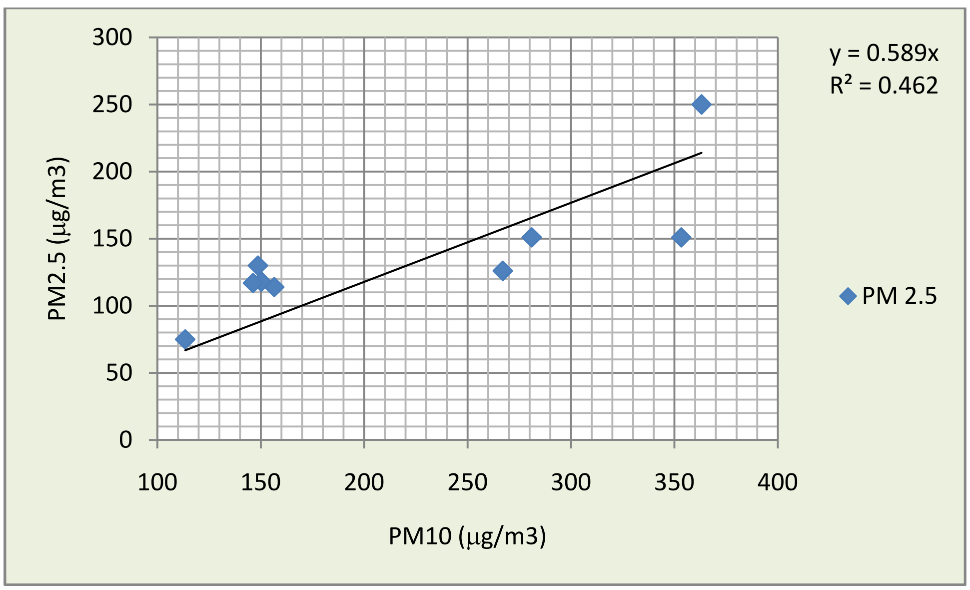
a. No PCC should be allowed to operate without proper shelter/cabin.
b. Training /awareness program are required to be organized from time to time for PCCs owners/operators in respect of new norms, latest technology available, legislation, Code of Practice and mandatory requirement.
c. Stringent action needs to be taken against PCCs issuing PUC Certificates with the duplicate sign of Authorized Signatory and un-authorized person operating the Centre.
d. Purging of the entire sampling line should be carried out after every monitoring /measurement so that no smoke/sample remains in the sampling line.
e. Presently in BS-II vehicles for measurement of Lambda emission of CO and HC are tested on low & at high idle speed. The PUC certificates are being issued based on the CO and HC values on low idle speed without considering the values of Lambda which is either meeting or not meeting the prescribed limit. The certificate should be issued based on the prescribed value of CO, HC and Lambda as the measurement of CO and HC at high Idle speed is more effective in indicating the proper functioning of catalytic convertor
f. The number of PCC centers need to be increased to cope up the requirement of increasing vehicular population in Delhi.
g. DoT may analyse/correlate the data of PUC certificates received at Central Server randomly and incase of any lapses, appropriate action needs to be initiated.
h. Action should be taken against the PCC Centers for using pirated software for issuing PUC Certificate

6.2 STATUS OF PARTICULATE TERMS OF PM_{10} AND $PM_{2.5}$ IN SELECTED COMMERCIAL AND INDUSTRIAL LOCATIONS IN EASTERN INDIA

Atmospheric inhalable particulate matter with reference to $PM_{2.5}$ demands vide attention due to its adverse impact on human health. The sources of $PM_{2.5}$ and PM_{10} are numerous in commercial areas and industrial towns in Eastern India. Regular monitoring to evaluate the PM_{10} and $PM_{2.5}$ mass concentrations and their associated chemicals is an emergent need considering the inclined trend of these substances.

Considering this aspect, CPCB, Zonal office Kolkata has undertaken a monitoring program for measurement of PM_{10} and $PM_{2.5}$ mass concentration in industrial and major towns of Eastern India. Three commercial locations at Kasba (Kolkata, West Bengal), BSPCB office & Gandhi Maidan (Patna, Bihar) and six industrial locations at Dhanbad city, & Jamadoba (Dhanbad, Jharkhand) and Panagarh, Durgapur, Asansol & Burnpur (Burdhman, West Bengal) were identified for monitoring purpose.

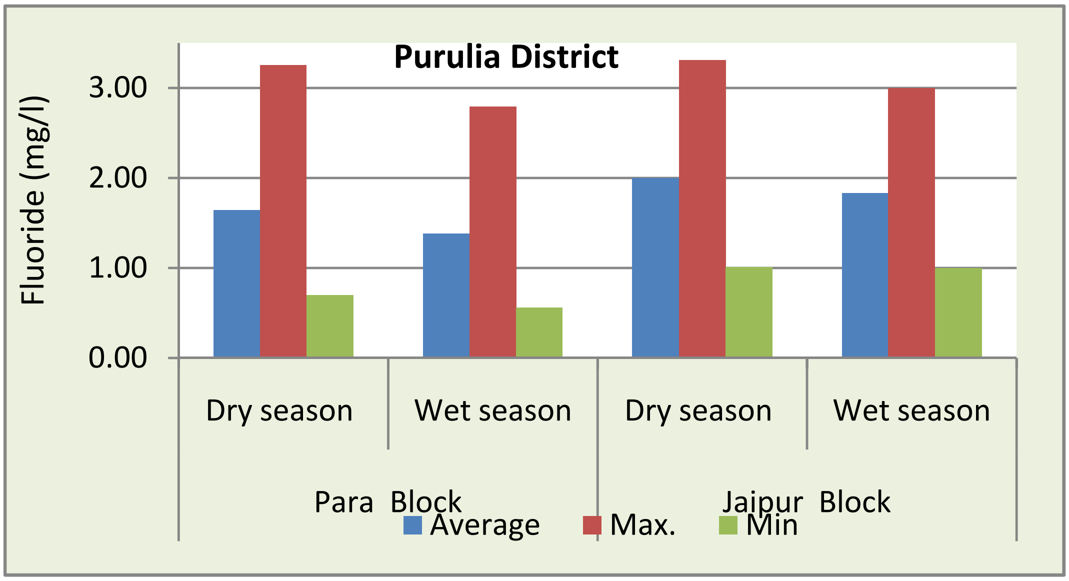
Particulate matter levels in terms of PM_{10} and $PM_{2.5}$ were observed during winter season. For Industrial locations average concentration of PM_{10} was 180±90 µg/m³ while for $PM_{2.5}$ it was 134±60µg/m³. For commercial locations PM_{10} and $PM_{2.5}$ values vary between 300±46 µg/m³ and 143±14 µg/m³ respectively. For all sampling locations both PM_{10} and $PM_{2.5}$ values exceeded the National Ambient Air Quality Standard which is 100 µg/m³ for PM_{10} and 60µg/m³ for $PM_{2.5}$ (specified for 24 hourly concentrations in Industrial, Residential, Rural and other Areas). A significant correlation between PM_{10} and $PM_{2.5}$ (R^2 = 0.462) was observed, indicating that variation in PM_{10} mass is governed by the variation in $PM_{2.5}$



During winter, the $PM_{2.5}$ contribution became more pronounced as compared to summer, signifying the adverse effect of critical meteorological conditions. High $PM_{2.5}$/ PM_{10} ratio was observed at all locations which varied between 0.43 - 0.87. The ratio was high in industrial locations compared to commercial sites. To get comprehensive source profile, it is needed to carry out further ionic characterization and metal profile of the particulate samples, for which the work is under progress.

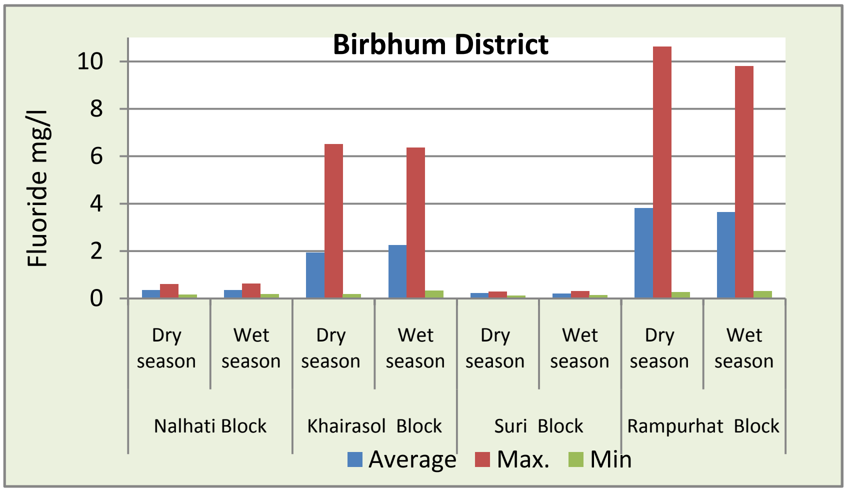
6.3 CHEMICAL CHARACTERIZATION OF GROUNDWATER IN FLUORIDE AFFECTED AREAS IN EASTERN PART OF INDIA

Groundwater is an important water source in rural areas. Due to the Limited accessibility to surface water especially during summer. The rural populatatian depend heavily on ground water resources to meet the requirements arising for drinking and agricultural purposes. High fluoride concentration in ground water of some districts has been reported. CPCB Zonal Office, Kolkata conducted a study of ground water in the district of Birbhum and Purulia of West Bengal. Samples were collected from 51 tube wells spread across affected blocks of Birbhum and Purulia district for two seasons (dry and wet).



The observed values indicate that fluoride concentration varies between 0.11 and 10.62 mg/l in Birbhum district and between 0.56 and 3.25 mg/l in Purulia district. The maximum concentration (10.62 mg/l) were observed in Noapara, Sastitala, at Rampurhat block of Birbhum district and (3-31 mg/1) Bali Sibmandir at Jaipur block of Purulia district. Based on the observation, it is evident that the high fluoride concentration in Ground water of Rampurhat and Khairasol block have impacted the population will fluoride-borne diseases (fluorosis) Though, the fluoride concentration was found higher than 1.5 mg/l in some of the tubewells in Purulia District, but complaints of fluorisis are not commonly reported. The block wise annual mean, minimum and maximum of fluoride concentrations observed in respective district are depicted in graphical form below:

Out of 51 tube wells, less than 1.5 mg/l fluoride concentration was observed in 67% tube wells, between 1.5 - 3.0 mg/l in 17% tube wells, between 3.0 - 5.0 mg/l only in 6%, and more than 5 mg/l in 10% of tube wells for both districtst. High values were found above permissible limit (1.5 mg/l) in 4 tube wells in Khairasol block, and in 8 tube wells in Rampurhat block of Birbhum district. In Purlia district, 3 tube wells in Jaipur block and 1 tube well in Para block of Purulia district reveals high concentration. Fluoride concentration of more than 3 mg/l were observed in 8 tube tubewells in Birbhum district. Flouride removal plant have been set up in two tube wells of Rampurhat block to reduce the fluoride concentration but effectiveness of the device was found unsatisfactory.



6.4 STUDY OF WASTE MANAGEMENT PRACTICES IN RAILWAY WORKSHOPS

Indian railway is lifeline of our country and to have smooth and uninterrupted service, it operates a network of large number of maintenance workshops and washing facilities. These workshops generate effluent, hazardous wastes, solid wastes etc., requiring proper storage, treatment and disposal so that impact on the receiving environment is minimized. Kolkata is the head quarter of 2 major zones of Railways – Eastern and South Eastern.

A study was undertaken by zonal office, Kolkata for assessment of the prevailing waste management practices by the major workshops of railways operating in eastern region. Easter and South Eastern railway has 10 operational workshops primarily engaged in maintenance and servicing of locomotive and passenger cars. Prominent workshops with their major function is tabulated below:

Name of the Workshop	Purpose/ Function	Remark
Carriage & Wagon Workshop, Liluah, West Bengal	Preventive and breakdown Maintenance of Passenger coach, Goods wagon	Eastern Railway
Railway Workshop, Kancharapara, West Bengal	Overhauling of EMU, Electric Loco	Eastern Railway
Howrah Diesel Shed, West Bengal	Preventive and breakdown Maintenance of Diesel loco	Eastern Railway
Barddhman Diesel Shed, West Bengal	Preventive and breakdown Maintenance of Diesel loco	Eastern Railway
Andal Diesel Shed, West Bengal	Preventive and breakdown Maintenance of Diesel loco	Eastern Railway
Beliaghata Diesel Shed, West Bengal	Preventive and breakdown Maintenance of Diesel loco	Eastern Railway
Chitranjan Locomotive Works, West Bengal	Manufacturing of Electrical Loco	Eastern Railway

Name of the Workshop	Purpose/ Function	Remark
Kharagpur Railway Workshop, West Bengal	Preventive and breakdown Maintenance of Passenger coach, Goods wagon	South Eastern Railway
Adra Railway Workshop, West Bengal	Preventive and breakdown Maintenance of Goods wagon	South Eastern Railway

Maintenance & overhauling of Coach/ Wagon/ EMU/ Loco generates solid waste such as Ferrous and Non-ferrous scrap, used and discarded electrical items, used oil/ lubricants, Rubber lining/ belts, Oil soaked cotton, Paint & sludge, Used batteries, glass wool, leachates, Oil soaked Wood dust/Sand. Most of the workshop has ear marked designated place for hazardous and non-hazardous waste and the materials are stored accordingly. The hazardous waste having potential of reuse/ recycle is sold to authorised recyclers by auction through centralised system and with buyback provision.

The wastes are stored in designated & secured place. All types of wastes are disposed through auction system which is organised centrally by Eastern Railway & South Eastern Railway respectively. The disposal method adopted for wastes is as following:

Waste	Disposal method
Ferrous scrap, Non ferrous scrap, Electrical items, Rubber lining/ belts	Through auction to various firms
Used oil/ lubricants	Through auction to Registered recycler
Used battery	Buy back scheme and through auction to Registered recycler
Oil soaked cotton, Paint & sludge, Hazardous waste	Sent to Secured landfill site (TSDF)

The wooden dust & sand is used to clean the oily surface (floor) during maintenance. It is scrapped manually and stored in secured place (Hazardous waste storage).

All workshops have installed effluent treatment plant and at some location (viz. Andal, Burdhwan, Liluah and Kancharapara) the part of treated efficient is used for washing purpose and excess is discharged to local surface water bodies. Reuse / recycle of treated wastewater can be explored and adopted by these workshops, instead of discharging it. The operation and maintenance of ETP is done through engagement of third party.

Wastewater Characteristics of Railway Workshops

Rail Workshop	Location (ETP)	Parameter						
		pH	BOD	COD	TSS	O&G	Fe	Zn
Railway Workshop, Kancharapara	Inlet	7.2	82	368	95.2	80	1.05	0.07
	Outlet	7.8	7.32	16	16	< 5	0.64	0.24
Andal Diesel Shed	Outlet	7.4	28	88	13	< 5	1.98	0.06
Burdwan Diesel shed	Inlet	6.8	10	32	< 5	161	0.45	0.05
	Outlet	7.3	2	8	< 5	< 5	1.07	0.07
Bamangachhi Disel shed	Inlet	6.8	214	432	145	90	2.57	0.44
	Outlet	8.4	< 2	4	< 5	< 5	BDL	0.07
Liluah Rail Workshop	Inlet	6.3	43	102	86	17.4	62.1	4.01
	Outlet	6.8	5	45	15	< 5	1.20	0.40

All parameters in mg/l, except pH

6.5 STUDY OF ENVIRONMENT MANAGEMENT PRACTICES IN RICE MILLS

Rice is a part of the staple diet of Eastern region. It is estimated that 70% of the world population uses rice as major source of calorie. The Eastern region (Bihar, West Bengal, Orissa, Jharkhand) is a major rice producer for the country

There are about 1500 rice mills in eastern region (WB - 700, Bihar -70, Orissa - 432 and Jharkhand - 130), with production capacity ranging between 25 TPD to 400 TPD. Production of boiled rice involves processess like paddy cleaning, soaking, drying, cleaning, destining, de-husking, sizing, whitening and polishing thereby having potential of generating pollutants having impact on the water and air environment. Most of the rice mills have switched over to rice husk from the traditional coal as fuel, thereby concern with respect to air emissions has reduce significantly. This may be considered as one major clean technology adopted by the industry, primarily because of cost effectiveness, but resulting in better environmental condition in the vicinity. The by-product–rice husk possess resource value and are used for extraction of edible oil (Rice Bran Oil), apart from substitute to the coal as boiler fuel. A typical rice mill for 1000 kg of paddy produces 650- 750 kg of Rice, 25-30 kg of rick husk and remaining as dusty unwanted materials. Modernization of rice mills are taking place by replacing manual operation with PLC based, effective giving better control over process and product quality.

Water pollution is a major concern from parboiled rice mills. Due to strict regulation from the SPCBs, most of the rice mills in the region are either operating a comprehensive ETP or are at different stages of muetiaetion. The ETP primarily consists, of anaerobic process followed by aerobic process to meet the stipulated norms. Water consumption varies between 0.8 to 1.2 mg / ton of product depending on the size of the plant, whereas the wastewater generation is between 0.4 – 0.7 ms/ton. The final discharge of the treated effluent is to surface water bodies or low lying area as per the location of the unit. Potential for use of treated wastewater for agricultural purpose is huge and such provisions are yet to be demonstrated or accepted by the units.

Major source of fugitive emission are Paddy handling and movement (for Manual operation), cleaning of paddy, De-stoning, De-husking, Rice polishing & grading, whereas for modernized units, such sources are eliminated bby using closed silos and facilities. For boiler flue gas, typical APCD adopted are Cyclone/ Wet Scrubber/ Baffled Chamber. The dust collected is good supplement as nutrients for agricultural purpose. Proper stack monitoring facilities are not available at many of the units.

The rice mills which are producing raw rice are based on dry technology and water is not required in the process.

The treated wastewater is either stored in ponds or discharged in local drain. However during study it was found that treated wastewater is used for ash quenching, gardening etc. As informed by plant owners, the treated waste water is also used by farmers for Agriculture.

During study wastewater samples (treated/ untreated) were collected to access the characteristics, which is tabled below:

Name of the Industry	Sampling location	Parameter				
		pH	BOD	COD	TSS	O&G
M/s Salasar Industry, Jamshedpur	ETP Inlet	5.1	1597	4160	564	< 5
	ETP outlet	5.6	879	3480	82	< 5
M/s RLG Pvt Ltd, Jamshedpur	ETP Inlet	6.4	957	2400	48	< 5
	ETP outlet	5.0	493	1760	36	< 5
M/s Bhawani Rice mill, Rourkela	ETP Inlet	6.77	439	868	90	-
	ETP outlet	7.07	10	40	10	< 5
M/s Moniza Agro, Burdwan	ETP outlet	4.2	947	1555	123	< 5
M/s Anjany Rice Mill, Asansol	ETP outlet	8.2	71	548	162	-
M/s Santuka Rice Mill, Cuttack	ETP outlet	7.6	84	180	123	-

***All parameters in mg/l, except pH*

Finding of the study reveals that about 50-60% of the rice mills are not meeting the stipulated discharge norms. Lack of awareness on water management practices is common among the unit officials. Abatement measures for fugitive emission have not been adopted.

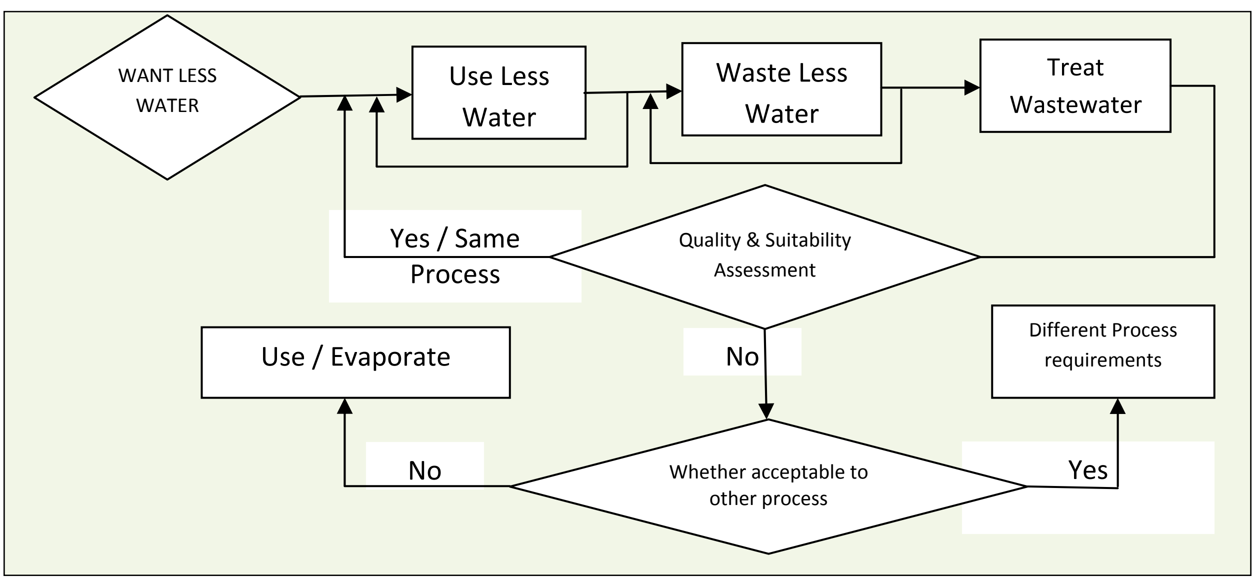
6.6 WATER MANAGEMENT IN INTEGRATED STEEL INDUSTRIES OF EASTERN REGION

In an integrated steelworks, water is used for direct and indirect cooling, gas cleaning, scale breaking and washing operations including waste gas cleaning with scrubbers. There can be various water systems in operation (a) completely closed, (b) semi-closed or (c) open circuits. There are only few completely closed loops. Closed circuits can be utilized for cooling circuits operated with de-mineralized or softened water at specific installations, i.e. for continuous casting moulds or at boilers in power plants, which are generally cooled through water exchanger.

In view of above, a study has been initiates to assess water consumption, management practices and potential for adoption of zero discharge in integrated steel industries of eastern region. **FIVE** prominent integrated steel plants, with Blast Furnace-Basic Oxygen Furnace Route (BF-BOF Route) have been selected for this purpose. Methodology adopted is mostly based on water audit approach. Requisite information are being collected and thereafter will be compiled and interpretation to develop water balance for individual process.

The interdependencies are identified and their correlations will be arrived intensively so that the water consumption can be reduced proportionately. Water intensive processes in steel works can be grouped in 3 broad categories such as:

Group	Process/Requirement
Cooling Water (Without Circuit)	Blast Furnace, Sinter Plant
Process Water Circulation	BF Top Gas Cleaning, Continuous Casting Hot rolling Mills
Process water partly reused, cascading etc	COBP Treated Effluent BF Slag granulation, Cold Rolling Mills Pickling Lines Galvanization Water Supply & treatment Plants Services & Utilities



- There is great challenge in arriving as the amount of water consumed and are being assessed by arriving by differentiating the intake and effluent or is estimated by the plant operator.
- Presently, as reported by the steel works, the overall specific water consumption varies between 3-5 m^3/ tcs (m^3/ton of crude steel produced)
- Treatment technologies such as settling pits, BOD plants, Tar Catch pit, Neutralization pit, clarifiers, sludge handling system are available with all plants. Some of the units are having well designed ETP and STP while a few are lacking adequate infrastructure or with poor operations and maintenance
- Most of the steel plants obtain water mainly from surface sources. Generally, ground water sources are used as contingent sources.
- Some of the practices which can lead to reduction in water intake and minimize amount of discharge are:
    - Avoiding the use of potable water for production line
    - Increasing the number and/of capacity of water circulating system by revamping existing units
    - Using water in cascading until critical parameter gets affected to unacceptable level and further use is not possible
    - Segregating of treated and untreated water to make disposal cost effective
    - Adopting and promoting of Rain Water Harvesting
    - Encouragement for water conservation through financial schemes/ incentives
    - Recycling & reuse of treated sewage water from township / utilities area for process
    - Water benchmarking with respect to overall consumption as well as process wise
- A matrix of techno-enviro-economically feasible technology for treatment of waste water generated from various processes of steel sector is under preparation by compiling the best practices for such units in national and international domain and the same will be evaluated for the units considered under this study.
- Suitability of such technology will be assessed on case to case basis considering various aspects in consultation with respective steel work in order to have the quantification of minimum discharge from respective plant with a road map in order to achieve zero lignid discharge. The study will be completed in FY 2014-15

6.7 STATUS OF FERRO ALLOY INDUSTRIES IN EASTERN REGION

Ferroalloys are essential ingradient for steel making and are alloys of iron with a high proportion of one or more other elements such as manganese, chromium, silicon etc. The ferro-alloys are classified as Ferro manganese, Ferro silicon manganese and Ferro chrome. As estimated, the present installed annual ferro-alloys production capacity in India is about 4.65 million tons and the industry is reportedly working at 60-65% of capacity. Ferro-alloy industries are spread all across India, but are mainly concentrated in area where raw material is easily available. Availability of chrome and iron ore in eastern region supported by huge demand from numerous steel manufacturing units operating in region has encouraged mushrooming of many small and medium size plants in eastern region.

Ferro alloy units use electric arc furnace thereby possesses potential of air and land pollution. Although, the solid waste generated has not been classified as hazardous waste but present management practices of such waste in the region has reasoned numerous outcry from population residing in their vicinity. The process being dry, does not require much water except for cooling purposes. A study to assess the air control pollution devices and their operational aspect vis-a-vis compliance verification to the stipulated norm has been undertaken by Zonal Office, Kolkata. The salient findings of the study are as below:

- About 84 Ferro alloy industries are situated in eastern region (Jharkhand -6, Orissa- 36 and West Bengal - 42). Questionnaire based information have been received from 30 industries and 7 industries have been assessed.
- The capacity of electric arc furnaces varies between 1.5 MVA to 60 MVA.
- All industries have installed Air Pollution Control Equipments (APCE) comprising mainly Bag filters & Cyclones preceeded by suction hood.
- The stack and fugitive emission monitoring carried out during the field visit shows that the stack emission varies between 26 mg/Nm^3 - 365 mg/Nm^3 against the stipulated limit of 100 mg/Nm^3.
- The online monitoring system has not been installed at the most of the stacks and wherever, such facilities are available, they are not operational.
- The dust emission arising from process at racking level and during tapping, contributes significantly to fugitive emission. The inadequate design of APCE results in high emission on continuous basis, resulting in prominent dust cloud emission above unit sheds.
- The collected dust from APCE are reportedly has resource value and can be reused by briquette making. Such practice has been found in some plants.
- Approximately 1.1 ton of solid waste is generated per ton of ferro alloy produced. The dust from ferro manganese is reused for making silico manganese. The dust produced during manufacturing of silicon manganese is dumped along with slag waste and are commonly used for low land filling.

6.8 ENVIRONMENTAL STATUS OF GIRIDIH INDUSTRIAL AREA IN JHARKHAND

Giridih, primarily engaged in the Mica business has witnessed a rapid growth in small and large scale steel units in late 90s due to availability of good quality of Coal and Power supply from DVC, supplemented by good demand of domestic steel consumption and availability of cheaper iron ore. In recent times high decibel concern from local residents about deteriorating environmental condition due to industrial activities has been raised. The environmental regulatory provision are regulated by State Pollution Control Board, however comprehensive and collective impact on the receiving environment needs to be assessed for adopting any comprehensive mitigative measures in the region. In view of the above a study on the environmental status of Giridih Industrial area was undertaken by Zonal Office, Kolkata. Salient observations are as below:

- Giridih industrial town is dominated by sponge iron plants (DRI plants) and rolling mills will installed production capacity of Sponge iron plants (1450 TPD), Rolling Mills (636 TPD), Steel Melting Shop (170 TPD) and Producer gas plants.
- The Solid waste having potential to adversely affect the ambient air and water quality are primarily stored at a distance of 3-5 km from the industrial area in Kolhamanjhi area by major players.
- The management of solid waste dumps and associated facilities for containment of surface runoff are not satisfactory and require close monitoring by SPCB. At some locations, the boundary walls are not provided, extending the scope of surface water discharge to low lying areas in the vicinity. The dumps need to be properly covered by soil, with proper strengthening of slope to avoid any slippage or slope failure.
- All the major sponge iron plants (all five operational) were subjected to stack and fugitive emission compliance verification. The stack emissions were not complying the norms for 4 stacks out of the 5 monitored and the observed sestyculers onelth was in the range of 157 mg/Nm^3 to 900 mg/Nm^3 against the stipulated limit of 150 mg/Nm^3. The fugitive emission was observed to be within limit.
- The ambient air quality monitoring was conducted at three locations (one in town area and two in industrial locations). The observed value at the selected location shows that RSPM level exceeded at all locations (range 111- 168 µg / m^3) against the limit of 100µg /m^3.
- The surface water (Parameter- pH, TSS, O&G, BOD, COD, Cl, TC, FC, Fe, T-Cr, Ni, Mn, Cu, Zn, Pb) and ground water (pH, Ca, Mg, Alkalinity, Cl, Fe, Pb, T-Cr, Zn, Ni, Mn, Cu) were assessed at 6 and 5 locations respectively. The river water quality is meeting the criteria of Class C of designated best use of

CPCB classification for the parameters pH and BOD at all location but not for Total Coliforms at 5 out of the 6 locations monitored. This validates discharge of untreated sewage from Giridih town to the River. Hardness in ground water was observed high.

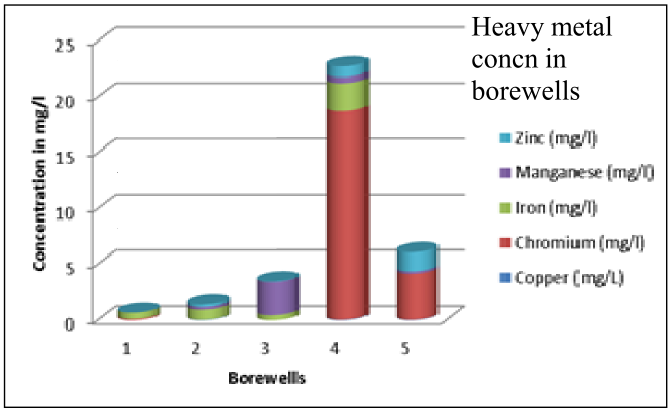
6.9 ASSESSMENT OF ELECTROPLATING UNITS IN BENGALURU

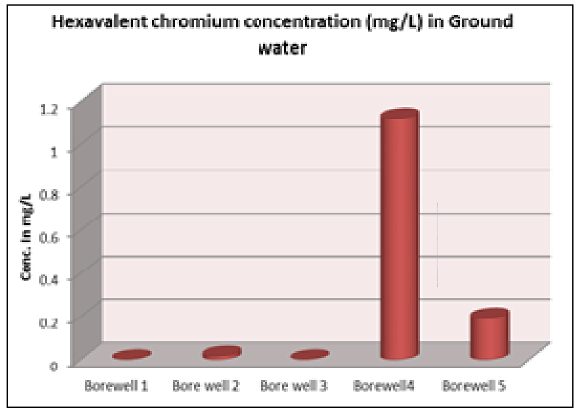
Electroplating is a technique of deposition of a fine layer of one metal on another through electrolytic process during which effluent containing toxic materials and heavy metals, air emissions and solid wastes are released into the environment. The electroplating units in Bengaluru are located in industrial areas namely Peenya, Rajajinagar, Yeswanthpur in the western part of the town at Koramangala in the south east and at Annekal, Bommasandra, Attibele & Hosur mostly in the southern part of the town. This study was taken up to assess the status of pollution control measures taken by the electroplating industries in Bengaluru.

The first phase of the study in Peenya industrial estate revealed that majority of the units are small scale units involved in job work characterised by haphazard location. The unscientific management of effluent,poor housekeeping, inadequate pollution control measures and unskilled manpower are leading to pollution threats affecting the environment and ground water in the vicinity.

The suggestions for betterment of the situation includes relocation of industries in designated industrial estates, proper management of effluent, utilization of trained manpower and adoption of cleaner technology. This will help to minimise the pollution load from electroplating units and to stop ground water pollution further in the Peenya industrial area.

Electroplating Units at Bengaluru





6.10 ASSESSMENT OF POLLUTION FROM TEXTILE DYEING UNITS LOCATED IN TIRUPUR, TAMIL NADU AND MEASURES TAKEN TO ACHIEVE ZERO LIQUID DISCHARGE (ZLD)

Based on the directions of Hon'ble High Court the textile dyeing units operating in Tirupur commissioned the ZLD plant consisting of RO plant and reject management system in 2010. A study was taken up to assess the measures adopted by the Textile Dyeing units in Tirupur including performance evaluation of the various pollution control system provided by the industries. The study also focused on status of surface & ground water quality in the surrounding area.

Findings of the study revealed that the individual ETPs and CETPs in Tirupur have implemented ZLD by installing combination of nano filtration, ultrafiltration and Reverse osmosis to recover water and brine solution. The water so recovered is recycled in the process and thereby fresh water consumption is reduced by 80-85%.

The RO reject concentrated through combination of MVR/ MEE (falling film, forced circulation evaporation)/ crystallisation/centrifuge and recovered either in the form of pure salt or in the form of brine solution being reused in the dyeing process.

Multieffect Evaporator | **Mechanical Vapour Recompressor** | **Solar evaporation ponds**

However still 5-7 % concentrated effluent having 30-35% TDS concentration being sent to solar evaporation ponds. None of the CETPs or IETPs are practising 100% salt recovery. Lime sludge generated from chemical treatment is sent to cement industries for co-processing. The CETPs/IETPs handling sludge from chemical and biological system are facing sludge disposal problem. The ground water quality will be monitored and the impact of ZLD system adopted in CETPs and IETPs will be verified in second phase of study.

Life Cycle Assessment (LCA) of Distillery Spent Wash and Pollution mitigation based on Environmental, Economic Considerations

The Spent Wash generated from molasses based distilleries, is dark brown in colour, having high COD, BOD, Suspended solid &inorganic solids requires careful handling and proper disposal to avoid damage to the environment. Average generation of spent wash is around 8-12 litres / litre of alcohol. A number of treatment technologies like physicochemical processes, bioremediation, Biogas production, bio-composting, other Biological processes, membrane filtration, disposal on land, Co-processing in cement industries, Concentration of spent wash in multiple effect evaporators and its subsequent incineration etc., are currently in practice.

The performance study was carried out to evaluate the environmental impacts and economic benefits of each treatment technology using “Life Cycle Assessment” as a tool. The study was carried out in 12 distilleries covering different treatment technologies.The study revealed that, evaporation process is comparatively expensive and costs Rs. 125-135 per m^3 of spent wash. The cost of operation of spray drier is also Rs. 205 per m^3 of spent wash. The incineration process generates steam but however, maintenance cost of the boilers is high due to the presence of inorganic salts. The feasible technologies are bio-methanation followed by bio-composting in terms of cost and fate of the pollutants. The nutrients are recycled in the soil and one m^3 of spent wash generates fertilizer value of Rs. 135. Integrated evaporation is one of the energy saving technologies which produce less than 8 m^3 of spent wash per m^3 of alcohol.

Direct composting of spent wash is an energy loss method where huge quantities of organic loads are converted to carbon dioxide using more energy. In the direct compost yard the odour problem is severe.

By and large Bio-methanation followed by bio-composting is economical and also yields value added product. For distilleries having space constraint, recovery of potash by MEE followed by spray drier/ incineration is a feasible choice.

OTCLA

Composting

MEE

6.11 STUDY OF SOLVENT RECOVERY SYSTEMS INSTALLED IN PHARMACEUTICAL AND PESTICIDE MANUFACTURING UNITS IN SOUTHERN ZONE

Organic solvents are used in Pesticide and pharmaceutical industries as reaction media and for separation & purification of synthesis products. As per Charter on Corporate Responsibility for Environmental Protection (CREP), the efficiency of solvent recovery should be at least 90%. This study is taken up to know the actual status of recovery, reconditioning and reuse of solvent in the Pharmaceutical and Pesticide industry.

The work is divided into two phases to study pesticide units in first phase and Pharmaceutical units in second phase. The operational status of pesticide industries in Southern zone was obtained from concerned SPCB's and through questionnaire survey followed by in depth study. The study mainly focused to obtain/ assess the solvent recovery with respect to their types, boiling point, and operational temperature etc., and also the condensers (primary, secondary, tertiary and common vent condensers) are in place.

The findings of the study indicates that, the pesticide industries generally use solvents like Ethylene Di chloride (EDC), Hexane, Dimethyl Carbonate, Toluene, Iso propyl Alcohol etc., Both ground level (Horizontal & Vertical) and Underground or mounded storage tanks with breather valve cum flame arrester are provided. Based on the mass balance approach, the estimated solvent recovery and loss from the system varies between 81.7% to 96.66 % and the loss varied between 3.34% to 18.3 %. It also confirmed the presence of VOC's in the ambient air; the reported compounds are Carbon Tetra Chloride, Ethyl Benzene, Toluene, Bromo Benzene etc.

Phase-I study is completed the study will be extended to Bulk Drug units and some more pesticide industries will be studied in phase II.

6.12 STATUS OF RO REJECTS MANAGEMENT BY VARIOUS CETPS AND INDIVIDUAL INDUSTRIES IN SOUTHERN REGION

Industries are trying for maximum utilisation of treated wastewater by installing RO system. The permeate from the RO is reused, whereas reject of RO contains high

Breather Valve

Colour coding of lines

Condensers

TDS, so the disposal of RO reject becomes a challenging issue. The objective of the project was to study the prevailing treatment methods adopted by various industries for management of RO reject.

Several disposal methods are existing for safe disposal of RO Reject, which includes direct surface water discharge, discharge to a sewage treatment plant, deep well disposal, evaporation ponds, thermal evaporation system and dilution with sewage/ treated effluents before surface discharge.

Discharge to surface water method is practically not feasible considering lack of perennial stream flow with sufficient carrying capacity to assimilate the contaminants present in the concentrate. Solar Evaporation and Thermal Evaporation methods are presently adopted in which disposal of the salt generated is the main concern beredes high installation and operations cost.

Dilution with treated sewage is one of the best options, which is cost effective. The diluted effluent can be recycled and reused for agriculture purpose. An option may also be kept open for industries and CETPs to dilute and discharge the RO reject with their own domestic treated wastewater or treated municipal sewage water and subsequent discharge to perennial rivers having minimum flow. The discharge quality and quantity shall be continuously monitored by installing online meters.

Solar Evaporation Pond

MEE

6.13 STATUS & ENVIRONMENTAL ISSUES OF PETHA INDUSTRY:

Pieces immersed in boiling sugar syrup

These are traditional sweet (Petha) making household units located in clusters within congested city areas. As per Agra Nagar Nigam, 322 Petha Manufacturing units are functional in city area of Agra. Household Petha manufacturing units are not classified as industries. The main cluster of Petha manufacturing units is Noorie Darwaja area. However many units are also functional in Madhu Nagar, Kedar Nagar, AlanGanj, Rohta, Baipur, Sheetla Gali, Bagh Muzzafar Khan, Chippitola and Moti Katra, locality. These units do not have proper effluent management system. The wastewater finds its way into river Yamuna through city drains.

The raw material requirement for Petha production (per 100 kg ready Petha) is as follows:

Table 6.1: Consumption of items for 100 kg prepared Petha

Sl. No.	Particulars	Quantity requirement for 100 Kg Petha (Approx)
1.	Sugar	75 Kg
2.	White pumpkin (Kaccha Fal)	150 kg
3.	Coal/coke	40 kg
4.	Lime	3 kg
5.	Milk	3 lit
6.	Water	500 lit
7.	Manpower	6 persons
8.	Waste generation Peel/seeds etc. Waste water	110 kg 400 lit

Pollution from Petha Units:

In general, one Petha unit employs about 6 workers and produces about 400 kg/day sweet. Based on unit production and calculations, total raw material consumption and waste generation by each unit as well as by 350 units per day is estimated. The waste generation of peel/seeds etc. (biodegradable) is about 150 tons and waste water genration 770m^3 per day for the 140 Tonnes production of Petha per day in 350 units.

General environmental issues related to Petha industry:

- Lack of hygiene and sanitation for the workers employed in the Petha units as

these units are household units functional in congested areas of the city.

- Lack of any waste water treatment facility in the units resulting in untreated waste water discharge into city drains.
- Use of coal/ coke as fuel in open furnaces (bhattis) for boiling Petha and making sugar syrup.
- No air pollution control system/ devices have been installed for open furnaces (bhattis) resulting in emission of pollutants like particulate matter, SO_2 and NOx etc. The health of workers is also a matter of concern because the workers seem to suffer due to air pollution as in many units they work and live in same premises.
- Unscientific dumping and disposal of solid waste from these units. Lack of proper management of solid waste in areas having Petha Manufacturing units resulting in thereby dumping of the solid waste on land, into the drains thereby chocking the drains and adversely affecting the environment.

- Increase in pollution level due to movement of commercial vehicle for transportation of raw material and products to and from these units located in congested city areas.
- Unhygienic conditions around the waste storage/ dumping areas creating nuisance and health issues for the citizens.

6.14 STATUS & ENVIRONMENTAL ISSUES OF SHOE INDUSTRY OF AGRA:

Agra is one of the biggest footwear producing center in India. As per Agra Nagar Nigam, there are 2802 leather industries/shops & factories in Agra, & as per M/s Ramky Enviro about 2500 units, which are located throughout the city mainly in slums and other parts of city. Major areas having footwear cluster in Agra city are Sadar Bhalti, Nai Ki Mandi, Shahganj, Lohamandi Jagdishpura, Gadi Badoria, Madiyakatra, Taliya Nala, around Agra Cantonment, Collectorate, Agra Matura Road (Bye-Pass) etc.

The ancillary factories also exist for the production of leather board, microcellular rubber sheet (MCR), EVA sheets, shoe lasts, PVC, TPR, PU unit sole, air mixed PVC sole and footwear tools, equipments and machines.

Pollution Status of Shoe Industries:

Most of the shoe units in Agra are of small and medium category and are operational in residential areas (non-confirming areas). The wastes from shoe manufacturing units are mainly solid waste. Semi and fully mechanized shoe manufacturing units have installed DG sets for heating, pasting, and for other requirement of power.

Waste generation from shoe industries:

- ***Solid Waste***- During shoe manufacturing process solid waste is generated, which contains cutting of synthetic leather, synthetic rubber, leather, PVC sheets, foam, synthetic cloths etc. used in shoe making.

The average waste estimation was carried out for 2500 units based on discussion with owners of one medium and three small units for peak and lean season.

Solid waste (shoe cutting etc.) generation during peak season				
Category	**no. of units**	**Solid waste per day per unit (kg)**	**Total (kg/day)**	**Ton/day**
Cat.-I (big)	500	30	15000	15
Cat.-II (medium)	1000	10	10000	10
Cat.-III (small)	1000	5	5000	5
Total	**2500**		30000	30
Solid waste (shoe cutting etc.) generation during off season				
Category	**no. of units**	**Solid waste per day per unit (kg)**	**Total (kg/ day)**	**Ton/day**
Cat.-I (big)	500	20	10000	10
Cat.-II (medium)	1000	5	5000	5
Cat.-III (small)	1000	3	3000	3
Total	**2500**		18000	18

- Solid waste generation is linked with shoe manufacturing activity. Before festival season as demand goes high, manufacturing also increases and as demand goes down, so manufacturing also goes down. So the solid waste generation is also varying in shoe units.

- This happen mostly in cat.-II & III units, because they are mostly depend act on local markets, while cat.-I units export then products and also supply to local market.
- Generation of solid waste from the export units is almost constants throughout the year. There are about 80- 90 shoe exporting units in Agra.
- Solid waste generated is about 10-20% of the sheets used in shoe making.
- The waste generation from all shoe units in Agra is estimated between 18-30 MT/day.

Disposal/ treatment Methods adopted for solid Waste:

- All typed solid waste generated from shoe units is mixed with the municipal solid waste and/or dumped in the nearby areas, drains and into municipal bins.
- Many shoe units sell leather cutting to other vendor in Agra, Hathras, Sadabad etc., where it is used for making other items like washer, chappals etc.
- Wastes generated from big shoe units is also recycled by small /household units for making decorative items, wallets, belts, bags and other items etc.
- Waste sold to rag picker and others is sometimes used as fuel in bhattis etc. During winter, people use it for burning/ heating/ alaav also.
- There is no record of solid waste maintained by any industry.

Chocked drains by Solid waste

6.15 STATUS OF ROLLING MILLS AND SECONDARY LEAD PROCESSING UNITS IN CPA INDORE

Hon'ble NGT in the matter of application no. 1/13 (P.B.No.73/2012 THC) "Centre for Environment Protection, Research and Development Vs State of M.P. and Others" passed order on dated 23rd August, 2013, with the direction to Central Pollution Control Board to monitor the status of Rolling Mills and Lead Processing Units etc. in Indore CPA.

In compliance of above order, Zonal Office, Bhopal and Regional Office of MPPCB, Indore have jointly inspected and monitored 60 industries. The observations are as below-

- Re-rolling mills shall install additional suction hood of adequate capacity at inlet (above feeding gate) of pusher furnace. The well designed hood shall be connected with duct and additional blower to the inlet of existing ventur scrubbing system. It will help in reducing dispersion of fugitive emission in process area.
- In some rolling mills there is a need of mevease in capacity of ID fans/blowers and water circulation pumps of ventur scrubbers.
- Fugitive emission from lead melting furnaces shall be controlled by providing adequate capacity of suction arrangements and hoods. Housekeeping in battery breaking area shall be improved by providing proper acid collection systems, proper handling and dedicated storage of lead plates.
- As a result of continuous follow-up about 30 Rolling Mills and 14 Secondary Lead Processing Units have implemented the suggestions give by CPCB which are verified jointly along with the team of MPPCB.

6.16 AIR POLLUTION CONTROL STATUS IN INDUCTION FURNACES, FERRO ALLOYS AND STEEL ROLLING MILLS.

Chhattisgarh and Madhya Pradesh are rich in iron ore and coal. The increased mining activity in this region has grown into one of the major steel industrial activities during the last decade, as a result the ancillary units like Induction furnaces, Ferro alloys and steel rolling mills have come up without proper air pollution control devices thereby causing lot of air pollution. Though some units have provided suction hoods which are connected to bag filters followed by 30m stack but due to improper operation of these control equipment fugitive emissions are generated continuously from the Induction furnaces and Ferro alloy units. Normally wet scrubber are installed in steel rolling mills and uses poor quality of fuels without consideration of air pollution control devices which in turn leads to uncontrolled emissions.

- In central zone steel rolling mill units operates (especially patta patti units) without any pollution control devices. These units generate huge quantity of acidic fumes, causing severe pollution in surrounding areas. Though, these units are in small scale sector but quantity of pollutants generated by these is significantly high. These units penches Stainless steel Flat Bars are purchased from primary manufacturers. The hot rollingnelly average production is 1000MT/ month for 24 hours operation and cold rolling mills average production per mill is 60MT/month. Hot Rolling mills are furnes of to maintain temperature of 1300^0C to 1400^0C. No air pollution control equipments provided at the furnaces to control air pollution.H_2SO_4, HNO_3, HF are used in rolling mills for pickling purpose. Lot of acid fumes when observed near the pickling units. No safety devices provided/ used by the workers except hand gloves.

- Induction furnaces are used to manufacture required quality of steel in steel industries. Almost all the large scale industries are having the induction furnaces but majority of them have not provided proper air pollution control devices. Few units have provided suction dome/hoods and bag filters to control emissions from induction furnaces and some have provided dust extraction system followed by venturi scrubbing. Fugeties emissions were seen during the visits from these plants indicating ineffective functioning of the control equipment.

- Majority of ferroalloys units located in Chhattisgarh state manufacture ferro-silicate and ferro manganese using Submerged Arc Furnaces (SAFs). Bag filters are installed to control emissions in SAFs. However, tyiling emissions was observed, indicating that the section system was not effective. Dust collected in bag filter is reused in furnace. Ferro manganese slag is used as a raw material in ferro silicate manufacturing and Ferro Silicate slag used in brick manufacturing.

6.17 ASSESSMENT OF AMBIENT AIR & WATER QUALITY IN AND AROUND COAL MINING AREAS OF JAINTIA HILLS, MEGHALAYA

Meghalaya is having very high deposits of coal, mainly in Jaintia Hills, West Khasi Hills and Garo Hills Districts. The coal deposit in the state are estimated approximately 569 million tones. There are five major coal belts in the state namely – Iorsky, Sutnga, Khlehriat, Jariang and Lakadang.

Coal mining is the major industrial activity in Jaintia Hills district and the mining activity is concentrated mainly in Wapung, Lad-rymbai and Khlehriat areas. The mining method practiced in the district/area is commonly known as **'Rat Hole'** mining. In this process, a vertical shaft of 10 to 50 sq m size to a depth of about 200 to 300 ft are cut/dug and miners reach the coal deposit and then cut the coal seam and extract the coal through the central shaft (Box cutting-rat hole) or directly start the rat hole on hill sides if the coal seam is not deep (direct Rat Hole).

The Coal deposits in the district are having very high Sulphur content **(3 to 6.5 %)** and, therefore, it results in discharging of '**Acid Mine Drainage' (AMD)**. During the mining operations, water deposited in the Mine Shaft and the small tunnels (Rat Holes) is pumped out continuously or drained out directly. The AMD from active as well as in the abandoned mines are having very low pH of 2-4 (Table-1). These mine effluents (AMD) are discharged in the surrounding area without any treatment and thereby effecting the water, soil and vegetation in the downstream.

Open dumping of the extracted coal without any treatment for acidic effluent coming out during rainy season has the same effect on environment. The acidic effluents from the dumping sites are released to natural drains without any treatment besid there are no protection of acidic leachate/effluent from entering the ground water.

The pH of the rivers water (Wah Khywi, Wah Syllih and Kmai rivers etc.) flowing through the mining areas are very low (**2.3 to 4.5 Ref table-1**) during dry season and the acidity of the water is also very high, in which survival of aquatic life is very unlikely. The pH level of water in this area is found alarming and the level of Iron is also very high in most of the samples analysed. But, the pH level in a bore well water at Khlieriat was found to be 6.5, indicating that the ground water may not be severely degraded.

Loading and unloading of coal and dumping on open land, in windy areas like Meghalaya releases loads of coal dust causing air pollution in the areas. Overburdens from mining activity are also openly dumped nearby the mines. Siltation due to open dumping of coal and over burden are also common in all low lying areas and cultivation of crops in these areas is practically not possible.

The main environmental issue from this coal mining activity in Jaintia Hills of Meghalaya is the discharge of 'Acid Mine Drainage' (AMD) from the coal mines and acidic effluent from coal dumping areas and air pollution from the extracted coal, during handling (storage and transport) and also from open dumping of over burden.

There is immediate need for treatment of AMDs and reclamation of the abandoned mines and improvement of handling system.

Box cutting Rat-hole mine

Direct Rat-hole mine

Rat hole mine with AMD

Land damaged by Over Burden

Open Dumping of coal

Open dumping of coal

Table-1. Water quality at coal mining areas in East Jaintia Hills, Meghalaya

	Wah Khywi River at Mookhlot	Coal mine at Mookhlot (Active)	Coal mine located at Hynniew Kilo (active)	Mine drainage at Hynniew Kilo	Abandoned mine at Hynniew Kilo	Abandoned rat hole mine at Sutnga Chyniar	Spring at Sutnga Chyniar	Wah Syrbang River at Moolamy-lliang	Wah Kwai River at Moolamy-lliang	Bore well at Khlieriat	Wah Syllih river at Rymbai	Mine drainage at Rimbai	Kmai River at Rymbai	Stream at Bapung
pH	2.8	2.7	2.8	3	2.5	3.2	6.6	2.9	3.3	6.5	2.8	**2.6**	2.8	6.0
Conductivity (us/cm)	1200	1700	1700	1130	3200	520.0	29.0	1100.0	540.0	390.0	1400.0	2200.0	1050.0	70.0
Turbidity (NTU)	4.8	28	29.0	14	16.4	8.0	2.0	7.0	6.6	7.0	16.0	22.0	16.0	4.5
TSS (mg/l)	10	40	45.0	25	35	15.0	5.0	15.0	15.0	15.0	25.0	40.0	35.0	10.0
Iron (mg/l)	4.4	9.52	10.0	5.28	10.8	3.87	0.28	5.2	4.8	3.8	5.1	4.6	5.6	0.64
Nitrate (mg/l)	0.97	0.659	0.8	4.1	1.66	0.5	1.07	0.682	0.782	0.287	1.28	1.32	0.73	0.55
Sulphate(mg/l)	154.0	510	508.6	152	506.8	136.0	7.48	150.0	141.1	104.9	152.0	306.0	151.9	4.754
Chloride(mg/l)	11	17.0	11	16	20.0	8.0	9.0	16.0	15.0	10.0	16.0	27.0	10.0	9.0
Total Hardness (mg/l)	300	200	300	200	240.0	120.0	40.0	140.0	120.0	100.0	260.0	320.0	200.0	40.0
Calcium (mg/l)	104	56	104.0	60	70.0	28.0	10.0	40.0	30.0	26.0	70.0	74.0	52.0	8.0
Magnesium (mg/l)	12.15	14.58	12.15	12.2	15.8	12.15	3.6	9.7	10.9	8.5	20.6	32.8	17.0	4.9
Total Phosphate (mg/l)	0.14	0.013	0.011	0.014	0.036	0.015	0.03	0.014	0.017	0.02	0.024	0.034	0.016	0.02
Acidity (mg/l)	72	116	80	40	310.0	30.0	6.0	62.0	16.0	14.0	18.0	162.0	56.0	6.4
Dissolve oxygen (mg/l)	6.4	4.6	NIL	3.2	3.0	7.4	7.0	6.0	5.4	2.8	7.0	4.4	9.6	9.2
Zinc (mg/l)	0.19	0.65	1.16	0.56	1.02	BDL	BDL	0.18	BDL	BDL	0.28	0.51	BDL	BDL
Manganese (Mn) (mg/l)	0.22	0.43	0.59	0.85	0.67	0.01	BDL	0.21	0.76	0.06	0.27	0.57	0.1	0.1

	Wah Khywi River at Mookhlot	Coal mine at Mookhlot (Active)	Coal mine located at Hynniew Kilo (active)	Mine drainage at Hynniew Kilo	Abandoned mine at Hynniew Kilo	Abandoned rat hole mine at Sutnga Chyniar	Spring at Sutnga Chyniar	Wah Syrbang River at Moolamy-lliang	Wah Kwai River at Moolamy-lliang	Bore well at Khlieriat	Wah Syllih river at Rymbai	Mine drainage at Rimbai	Kmai River at Rymbai	Stream at Bapung
Copper (mg/l)	BDL	0.01	BDL	BDL	0.14	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead (mg/l)	BDL	BDL	BDL	BDL	0.09	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium (mg/l)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (mg/l)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel (mg/l)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

6.18 IMPACT OF JHUM CULTIVATION ON AMBIENT AIR QUALITY IN NORTH EASTERN STATES

Most of the hilly areas of North Eastern region of India are covered by mixed forest. The main occupation of the people living in these areas is Jhum Cultivation. The forest are cut down and kept 2-3 months for drying and burnt. The main environmental issues in this activity are air pollution during the burning and runoff water from the land during the monsoon period.

Impact Assessment of Jhum Cultivation on environment in North Eastern States of India was initiated from 2008 by the CPCB Zonal Office, Shillong. From 2010-2011 assessment of Jhum Cultivation/burning impact on the environment of the area was conducted again with a target to find out the possible way of reducing the burning period/exposure time.

The Ambient Air quality was monitored before burning, during burning and after burning of the Jhum areas in Manipur, Mizoram, Assam and Meghalaya the monitoring resurch indicats levels of Suspended Particulate Matters (SPM) and Ambient Carbon Monoxide (Ambient CO) during the burning time.

The Ambient Air Quality in the burning areas of the four states was found degraded. The level of Respirable Suspended Particulate Matter (PM_{10}) before burning (Background) in most of the Jhum areas were lower than 100 $\mu g/m^3$, while the level during the burning period ranged between 200-300 $\mu g/m^3$. The level of Ambient Carbon Monoxide level before burning was BDL while that on burning days was as ligh as 220 mg/m^3.

Suggestion was given to Jhum Cultivators in Manipur to have time schedule for burning of Jhum Areas to reduce the time of exposure which last for one and half months and can be brought down to fifteen days.

Cut Forest drying to be burnt for Jhum cultivation

Burning of Forest land for Jhum cultivation

Burnt forest for Jhum Cultivation

Jhum cultivation with crops

6.19 MONITORING OF LARGE CEMENT PLANTS AT LUMSHNONG –MEGHALAYA

Eleven (11) large cement plants in Lumshnong and its surrounding areas, Jaintia Hills, Meghalaya were monitored. The capacities of these cement plants vary from 900 TPD to about 5500 TPD. All these cement units have captive lime stone mines with mining lease areas varying from 1.5 Ha to about 70 Ha. A few of the units are having coal based captive power plants. The list of the cerrent plants with their precluty ditails are as follows.

Sl No	Name of the unit	Year of commissioning	Production Capacity (TPD) Cement/ Clinker	Area under captive limestone mine (hectares)
1	Cement manufacturing company Limited	2004	1800	Wah Pynkon Limestone mine: 4.85 CMCL mine : 35 ha CMCL Khub 1 mine:4.96 Ha CMCL Khub II mine:4.70 Ha
2	Meghalaya Cements Limited	2006	900	Rymai Snden Mine: 4.9 Khliehjari limestone mine: 4.88 M/s Meghalaya Cements Limited: 44
3	Adhunik Cement Limited	2011	OPC : 3900 PPC : 4800	Limestone Mine block –I : 4.90 Ha Limestone Mine block –II : 4.90 Limestone Mine block –IV : 4.90

Sl No	Name of the unit	Year of commissioning	Production Capacity (TPD) Cement/ Clinker	Area under captive limestone mine (hectares)
4	Hills Cement Company Limited	2009	1000 (1st phase)	69.4 Hills Cement Company Limestone mine: 4.0 ha
5	JUD Cements Pvt Limited	2009	900	4.76
6	Green Valliey Cement Pvt Limited	2011	Clinker:2000 Cement: 2600	
7	Amrit Cement Limited	2012	Clinker: 4303.03 Cement : 4545	30
8	Star Cement Meghalaya Limited	2012	Clinker : 5300	75
9	Goldstone Cement Limited	Not yet commissioned	Clinker : 1250	41.50
10	Cosmos Cement Limited	Not yet commissioned	Clinker: 4500 Cement : 6250	160
11	Megha Technical & Engineers Pvt Limited	Not yet commissioned	Cement: 2040	1.5

The rapid growth of these large air polluting industries, together with captive mining and captive thermal power plants can impact the surrounding Environment. Emission monitoring was carried out to assess the compliance states of these pollution load discharged by these cement plants. The monitoring indicater that all the cement plants complied with the industry specific emission norm of 50 mg/Nm^3, all the industries have installed various air pollution control devices (ESPs, Bag Filter. etc) to control the source emissions at its various units uncontrolled fugitive emissions were observed in most of the cement plants, especially in fly ash handling areas.

6.20 IMPLEMENTATION OF THE 'CHARTER FOR WATER RECYCLING AND POLLUTION PREVENTION IN PULP AND PAPER INDUSTRIES IN GANGA RIVER BASIN' BY PULP & PAPER MILLS OF FIVE IDENTIFIED CLUSTERS OF UTTARAKHAND AND UTTAR PRADESH

Central Pollution Control Board (CPCB) has evolved a 'Charter for water recycling and pollution prevention in pulp & paper industry in Ganga River basin'. The Charter takes a holistic approach for pollution prevention in Pulp & Paper industries by emphasising on process technology up-gradation and adoption estellaties of best practices, besides quantum improvement in effluent treatment including tertiary treatment system to reduce fresh water requirement, improve effluent quality and optimise water recycling.

The detailed implementation programme prescribes stringent fresh water consumption norms for various categories of Pulp & Paper industries, with improved effluent quality. Agro based Pulp & Paper industries were asked to stop chemical pulping till commissioning of chemical recovery plants (CRPs). Seven common CRPs/ individual CRPs either matelled or one at vassang stays of installation under the programme. Provisions have been made for strict metering of the water use and wastewater generation, self monitoring and reporting by individual industry, third party monitoring & assessment through CPPRI & local Paper Mills Associations, besides extensive & regular monitoring by CPCB/ SPCBs.

Six Common Chemical Recovery Plants, an innovative initiative under the Charter, have been commissioned resulting in complete stoppage of black liquor discharge and significant improvement in river water quality and abatement of perpetual colour problem in river water.

There has been reduction in fresh water cinsumption for varous categories of Pulp & paper industries, viz. from 100 m3 /topaper to 60 m3 /topaper in case of agro based writing & printing category, from 75 m3 /topaper to 40 m3 /topaper in case of agro based kraft category, from 50m3 /topaper to 20 m3 /topaper in case of RCF based writing & printing category and from 35 m3 /topaper to 10 m3 /topaper in case of RCF based Kraft category, besides quantum improvement in effluent quality with BOD < 10 mg/l and SS<5 mg/l, which ultimately leads to recycling and reuse of treated effluent.

6.21 USE OF BENEFICIATED/ BLENDED COAL AND UTILIZATION OF FLY ASH IN THERMAL POWER PLANTS

Vide Notification G.S.R. 02(E), dated January 02, 2014, amendments were made in the existing Rules in respect of use of washed/ blended or beneficiated coal with ash content not exceeding 34 percent on annual average basis in Thermal Power Plants. As per the amended rules power located between 750-1000 & 500-750 shall be supplied with and shall use raw or blended or beneficiated coal with ash content not exceeding 34 percent on quarterly average basis w.e.f January 01, 2015 & 2016 respectively while power located beyond 1000 kms from pit head shall be supplied with and use raw or blended or beneficiated coal with ash content not exceeding thirty four percent on quarterly average basis with immediate effect.

It is estimated that Thirty four more plants having installed capacity of 30350 MW (in addition to existing 50 plants) will require to use beneficiated coal after the implementation of the amendment in the existing notification. About 151.2 million tons per annum additional beneficiated coal (on 100% basis)would be required for meeting the requirement after implementation of the amendments

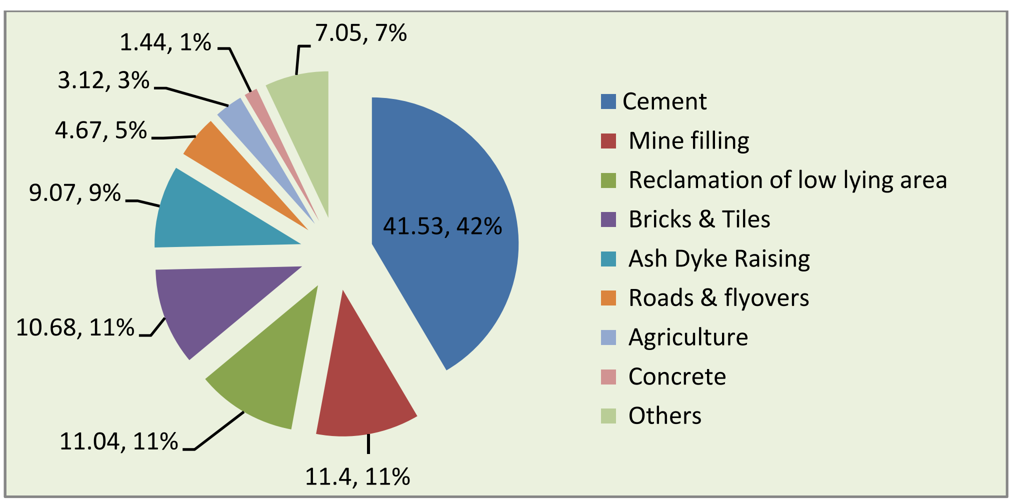
To meet the demand of washed coal, erestiy and proposed. There is a need to augment the capacity of coal washing. The present capacity of washing of coal is only about 103 million tones per annum which is envisaged to reach 263 million tonnes in next five years. There is a gap of about 88 million tones in demand and supply. About 92 million tones capacity for beneficiation of non-coking coal is under installation by Coal India Ltd. The demand of beneficiated coal would further increase w.e.f. January 01, 2015 & 2016 as per the amendments in the notification dated January02, 2014.

Utilization of flyash

During 2013-14, about 512 *(provisional)* million tones coal was consumed in power sector including captive power plants which in turn generated about 169 *(provisional)* million tones offlaysh. Out of 169 mta, about 94.2 *(provisional)* mtaflyash was utilised for various purposes. Though, power plants have submitted time bound action programmee to achieve hundred percent flyash utilization, only 39 (out of 141 plants) have achieved 100 % utilization while 46 plants achieved more than 50 % the targeted utilization.

The important areas of ash utilization and percentage of utilization in respective areas during 2013-14 *(provisional)* are indicated and shown in figure 1.

Sr. No.	Mode of utilization	Quantity of Fly Ash utilized in the mode of utilization (million Tonne)	Percentage of utilization
1	Cement	39.12	41.53
2	Mine filling	20.8	11.40
3	Reclamation of low lying area	10.4	11.04
4	Bricks & Tiles	10.06	10.68
5	Ash Dyke Raising	8.54	9.07
6	Roads & flyovers	4.4	4.67
7	Agriculture	2.94	3.12
8	Concrete	1.36	1.44
9	Others	6.64	7.05
	Total	**94.2**	



Areas of flyast utilisetion

CHAPTER VII

ENVIRONMENTAL RESEARCH

7.1 PILOT PLANT STUDY USING SLUDGE-REAGENT-PRODUCT (SRP) TECHNOLOGY

The Central Pollution Control Board (CPCB) in collaboration with Dr. S. K. Biswas (former Advisor, Rajiv Gandhi Water Mission) initiated an R & D Project “Treatment of Water and Wastewater using Sludge-Reagent-Product (SRP) Technology” to tackle the problem of large amount of sludge generated from the water works, which use alum for precipitation of colloidal particles during coagulation and flocculation process. While dealing with the waste sludge problem, CPCB came out with an innovative idea of regenerating and recycling the alum along with positive charged colloidal particles in water treatment process.

This treatment technology entitled “An Integrated Plant for Treatment of Raw Water Using Discarded Sludge to Produce Drinking Water” has been patented vide Indian Patent No. 215808.

Based on the laboratory scale studies a Memorandums of understanding (MoU) was executed between CPCB and Delhi Jal Board for Construction and Operation of Pilot Water Treatment Plant (OSMLD capacity) based on SRP technology at Bhagirathi Water Treatment Plant, Gokulpuri, Yamuna Vihar Delhi.

SRP Technology based Pilot Water Treatment Plant

This Pilot Project is fully funded by Central Pollution Control Board. The pilot plant is working successfully for more than one year i.e. from December 2012 onward. The drinking water quality of SRP-Technology based Pilot-Plant has been Analysed by Delhi Jal Board and CPCB and found at par with the water quality, generated from conventional treatment process

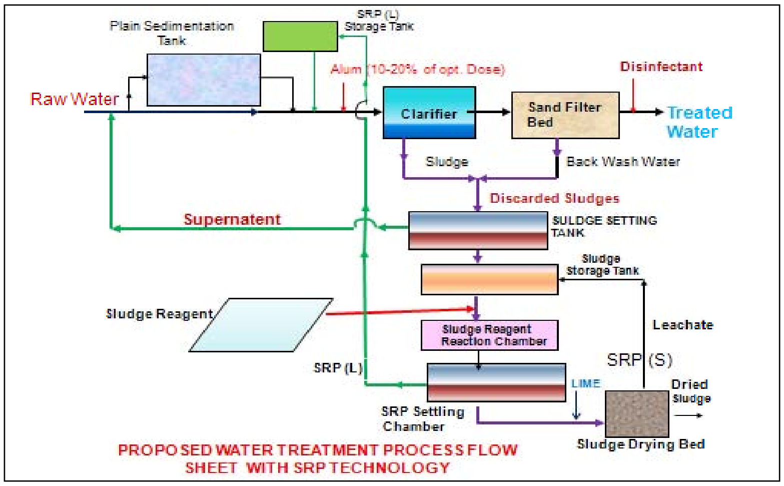


Figure 7.1 : Water Treatment Process Flow Sheet with SRP Technology

Sludge Reagent Product (SRP)

The discarded sludge obtained from coagulation of water treatment system was treated chemically and the product obtained was named as 'Sludge Reagent Product' (SRP), was used successfully as coagulant in lieu of the fresh alum used in the water work. The process involves following steps:

1. Collection of Sludge from Clarifloculator and sand filter backwash.

   Transferred sludge into the Sludge–Thickener-Tank and retained it for 45 Minutes
2. Transferred (Recovered) supernatant water into the Raw water in-take point.
3. Transferred thicken sludge into the Sludge-Storage-Tank.
4. Transferred Fixed Volume of sludge and SRP- Reagent into the SRP- Reaction –Chamber and mix it for 15 minutes.
5. Transferred mixture into the SRP-Settling chambers and settled it for 30 minutes.

Figure 7.2 : SRP Production Process in Pilot Plant

6. Transferred supernatant (i.e SRP) into the SRP-Storage-Tank for further use in Water Treatment Process as recovered alum.
7. The settled sludge which is acidic in nature is transferred into the Lime-Mixing-Tank followed by Sludge-Drying-Bed.

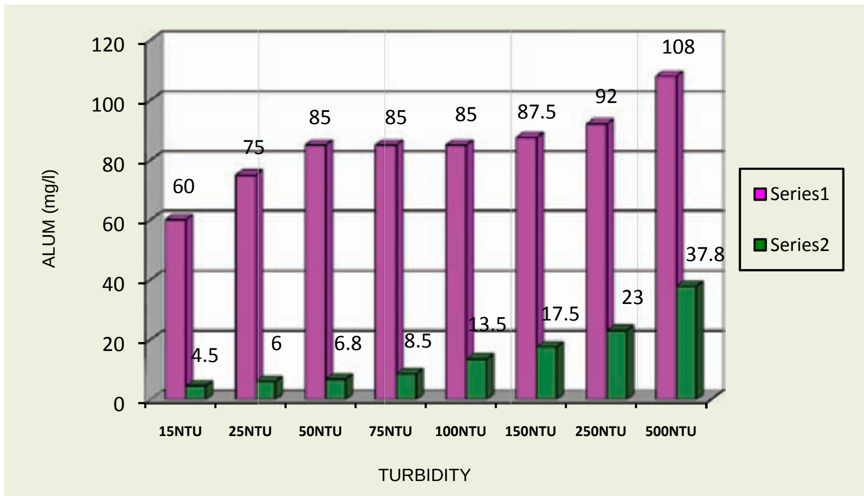


Figure 7.3 : Alum Requirement for Treatment of raw water at different NTU in Conventional Vs SRP technology

The fresh alum requirement in SRP technology varied from 7 to 30 % in comparison to Conventional technology. In other word 93 to 70% of alum requirement is fulfilled by the recovered alum i.e. SRP.

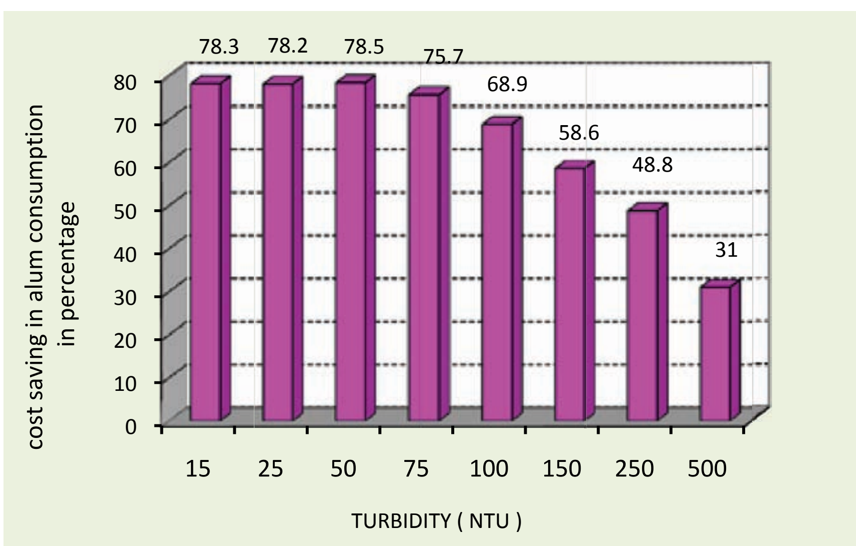


Figure 7.4 : Cost-effectiveness of SRP Technology in Treating Yamuna River Water at Different Turbidity

The cost saving by eliminating the use of fresh alum ranged from 70 to 78% with comparison to conventional treatment technology. The limitation of SRP technology is that raw-water treatment with turbidity more than 500 NTU is not cost effective.

Advantages of SRP Technology

- Reduction in alum consumption 80 – 90% and reduction in volume of sludge substantially.
- 100% water recovery in comparison to conventional process where 15-20% of water is lost along with sludge.
- Zero wastewater discharge achieved.
- Reduction in treatment cost i.e. 40-60%
- Reduce pressure on the limited resources of raw material necessary for production of alum.
- Protection of Natural-Water-Bodies from alum contaminated sludge pollution.
- The process is simple and does not involve use of additional equipment for implementation.

Expected Savings of about Rs 65 crore per year on adoption of this renovated Technology in Drinking Water Treatment processes.

7.2 MEASUREMENT OF HAZARDOUS ORGANIC COMPOUNDS DIOXIN (PCDDs) AND FURAN (PCDFs) IN ENVIRONMENTAL SAMPLES

Polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzo-furans (PCDFs) are environmental contaminants usually present in diverse environmental matrices. Out of the 75 theoretically possible PCDD congeners and 135 PCDF congeners, 7 PCDD congeners and 10 PCDF congeners are having considerable toxicity. These congeners are monitored as per internationally practiced convention (WHO-TEF) in environmental matrices, which may vary from sub ppt level and may reach up to ppm level. Under the purview of project, the following sub-activities have been executed:

- **Monitoring of Dioxin – Furan in Stationary Source Emissions**

The monitoring of Dioxin – Furan in stationary source emission at Treatment Storage and Disposal Facilities (TSDFs) Incinerator and Municipal Waste Incineration to Energy Generation (Waste to Energy) have been undertaken.

Figure 7.5 : Dioxin / Furan Source Emissions Monitoring

National Ambient Air Dioxin Monitoring Program

Ambient Air Dioxin – Duran monitoring program has been continued by Central Pollution Control Board at ten additionally identified Critically Polluted Areas (CPAs) in the country in association with CPCB Zonal Offices at Bangalore, Kolkata and Vadodara.

S. No.	Monitoring Responsibility HQs / Zonal Offices	State	Identified Critically Polluted Area for Monitoring
1.	National Reference Trace Organics Laboratory, HQs Delhi	Uttar Pradesh	Kanpur
			Noida
		Haryana	Faridabad
2.	CPCB Zonal Office – Vadodara	Gujarat	Ahmedabad
		Maharashtra	Dombivili
			Auranbagad
3.	CPCB Zonal Office – Bengaluru	Tamilnadu	Coimbatore
			Manali
		Karnataka	Bhadrawati
4.	CPCB Zonal Office - Kolkata	Jharkhand	Dhanbad

The vapour phase and particulate phase Dioxin & Furan ambient air sampling was performed using Polyurethane Foam High Volume Sampler (PUF-HVS) at identified locations within the Critically Polluted Areas (CPAs) on quarterly basis.

During year 2013-2014, two quarterly Vapour phase and particulate phase samplings have been completed at identified critically polluted areas as detailed in table No. The collected vapour phase and particulate phase samples were subjected to extraction of dioxin-furan from the sampling media and removal of interferening organic compounds. The sample extracts after clean-up were analysed by High Resolution Gas Chromatograph with High Resolution Mass Spectrometer (HRGC-HRMS) for Dioxin-Furan 17 congeners.

Extract Cleanup

Extract Concentration

Figure 7.6 : Dioxin / Furan samples Pre-treatment

Figure 7.7 : High Resolution Chromatograph – High Resolution Mass Spectrometer for Dioxin / Furan Analysis

7.3 VOLATILE ORGANIC COMPOUNDS (VOCs) MEASUREMENT IN DRINKING / SURFACE WATER SAMPLES BY PURGE AND TRAP GC-MS

Volatile Organic Compounds (VOCs) are carbon-containing compounds that readily evaporate at normal air temperature. Fuel oils, gasoline, industrial solvents, paints, and dyes are the major sources of VOCs. US-EPA lists 68 most common VOCs for environment assessment from the known sources. These 68 VOCs cover a wide range of chemical compounds that have different chemical and physical properties and different levels of toxicity. Chlorinated VOCs are associated with commercial and industrial use and include dozens of chemicals that are typically very mobile, persistent, and toxic in the environment. Non-chlorinated VOCs are associated with gasoline, fuel oils, and industrial solvents. These non-chlorinated chemicals are persistent, volatile, but less toxic than the chlorinated solvents. VOCs are very mobile and these may be dissolved and washed out with run off water reaching surface water resources and may also leach into the ground water.

National Reference Trace Organics Laboratory (NRTOL) of Central Pollution Control Board (CPCB) had undertaken Project "Monitoring Volatile Organic Compounds (VOCs) in ground water and surface water of critically polluted areas (CPAs) of the country' during financial year 2013 – 2014. Three rounds of monitoring of ground water and surface water were undertaken in selected CPAs i.e. Ankleshwar, Vapi (Gujarat), Singrauli (U.P.), Bhiwadi (Raj), and Ludhiana (Punjab). The collected water samples were analyzed for 43 VOCs adopting Purge & Trap pre-concentration followed by analysis using GC-MS following USEPA Method 524.2. The analysis results indicate that VOC contaminations was prevalent in 13.5% to 81.3% water samples. The concentration of Dichloromethane and Chlorobenzene was maximum at Critically Polluted Area, Ludhiana (Punjab) and Critically Polluted Area, Vapi (Gujarat).

7.4 MONITORING OF PESTICIDE RESIDUES AT NATIONAL LEVEL - SPONSORED PROJECT BY MINISTRY OF AGRICULTURE, NEW DELHI

Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, New Delhi and nodal department i.e. Project Coordinating Cell, All India Network Project (AINP) on Pesticide Residues, Indian Agricultural Research Institute New Delhi sponsored a project "Monitoring of Pesticide Residue at National Level" to Central Pollution Control Board, Delhi during October 2006. The objective of the study was to evaluate the levels of pesticides in ground water in National Capital Territory Delhi upto March, 2009. During 2009-2010, the Monitoring of Pesticide Residue in Surface Waters and agricultural soils in National Capital Region Delhi was undertaken. The Monitoring of Pesticide Residue is being continued in surface waters since year 2012-13 on monthly basis in National Capital Region i.e. Uttar Pradesh (Ghaziaad, Gautam Budh Nagar & Baghpat), Haryana (Sonepat, Faridabad & Ballabhgarh) and NCT - Delhi (Alipur Block, Kanjhawala Block & Nizamuddin Bridge).

The following groups of Pesticides are being monitored on regular basis:

Pesticide group	Pesticides monitored (33 Nos.)
Organochlorine Pesticides: (14 Nos.)	α-HCH, β-HCH, γ-HCH, δ-HCH, Endosulfan-I, Endosulfan-II, Endosulfan sulfate, Dicofol, *p,p'*-DDE, *p,p'*-DDD, *p,p'*-DDT, Aldrin, Dieldrin, Heptachlor

Pesticide group	Pesticides monitored (33 Nos.)
Organophosphorous pesticides: (9 Nos.)	Chlorpyriphos, Dimethoate, Ethion, Malathion, Methylparathion, Phorate, Phosphamidon, Quinolphos, Profenophos
Synthetic Pyrethroids: (6 Nos.)	α-Cypermethrin, Deltamethrin, Fenpropethrin, Fenvalerate, λ-Cyhalothrin, β-Cyfluthrin
Herbicides: (4 Nos.)	Pendimethalin, Alachlor, Butachlor, Fluchloralin

During 2013-14, 820 surface water samples collected were analysed for various pesticides and monthly reports submitted to project Coordination Cell. The study during year 2013-2014 indicated that only three samples had detectable pesticides residue beyond reporting limit (>0.5 ppb) out of Total 820 water samples, (Fig. 7.8) while in remaining surface water samples (817 Nos.), the pesticides contamination was either absent or below the reporting limit (0.5 ppb).

Department of Agriculture and Corporation has extended the Administrative Approval for continuation of project at National Reference Trace Organic Laboratory of Central Pollution Control Board for the next financial year 2014-2015 i.e. April 2014 to March 2015.

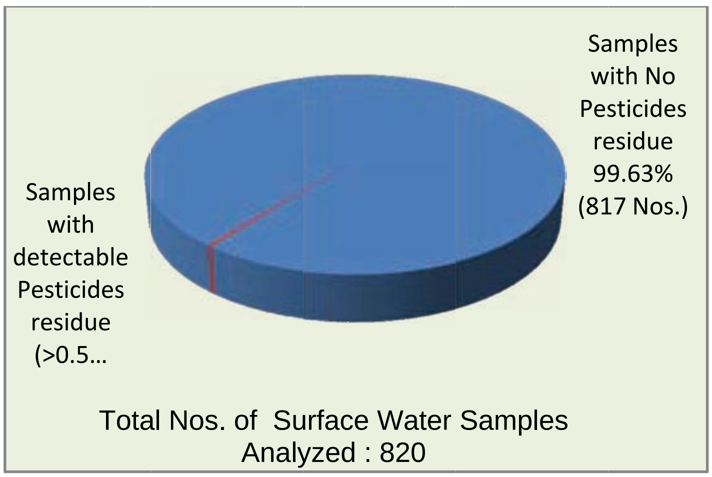


Figure 7.8 : Summary of Pesticides Analysis in surface water samples

Development and Standardization of Methodology for Trace Organics Parameters (Chlorobenzene) as Per-Notification under the Environment (Protection) Act, 1986

Chlorobenzenes are some of the most frequently encountered compounds in aqueous systems among Persistent Organic Pollutants. Chlorobenzenes are used mainly as intermediates in the synthesis of pesticides and other chemicals, space deodorants and as etc. moth repellent, component of dielectric fluids etc. These compounds can enter the environment via natural and anthropogenic sources. Several chlorobenzene compounds, once present in the environment, can be biologically accumulated, and are recognized as carcinogens and extremely hazardous to health. The toxicity of chlorobenzenes increases with the degree of chlorination of the benzene ring. The excessive exposure of chlorobenzenes may affect the human health through central nervous system, hematological disorders including anemia, irritation of the upper respiratory tract, irritation of eyes and hardening of the skin.

Chlorobenzene compounds are listed as priority pollutants by the United States Environmental Protection Agency (USEPA). The chlorobenzenes are critical environmental pollutant they may act as precursors for the formation of polychlorinated dibenzodioxins/ polychlorinated dibenzofurans and can lead to taste and odor problems in drinking water & fishes; their residues persist in organically rich anaerobic sediments, soils and ground water in incineration processes.

High sensitivity detection is required for the analysis of chlorobenzenes at low levels, especially in aqueous samples. High Performance Liquid Chromatography (HPLC) with Ultra-Violet (UV) detector may be the method of choice for such analysis because it provides both high sensitivity and specificity. During financial year 2013-14, National Reference Trace Organics Laboratory of Central Pollution Control Board, Delhi has initiated the project for standardization of methodology for determination of Chlorobanzenes as per EPA notification using reversed-phase HPLC with Ultra-Violet (UV) Diode Array Detector adopting following analytical parameters:

Analytical column : Reverse Phase, C18, 25cm x 4.6 mm, 5 µm
Guardcolumn : Eclipse XDB-C8, 4.6 x 12.5 mm, 5 µm
Injection : 20µl (with calibrated loop)
Mobile phase : Acetonitrile : Water
Solvent program : Gradient

Time	Acetonitrile (%)	Water (%)
0.01	65	35
30	80	20
40	65	35

Flow rate : 1.00 ml/min
Detector : UV-DAD at 205 nm

Average limit of detection (LOD) and limit of quantification (LOQ) of priority chlorobenzenes have been determined using the methodology and derived values are reported below:

Detection (LOD) and Quantification (LOQ) limit of Priorty Chlorobenzenes

S. No.	Chlorobenzene	LOD, µg/l	LOQ, µg/l
1.	Chlorobenzene	0.11	0.35
2.	1,4- Dichlorobenzene	0.02	0.07
3.	1,3-Dichlorobenzene	0.01	0.03
4.	1.2.3-Trichlorobenzene	0.01	0.05
5.	1,2,4-Trichlorobenzene	0.01	0.03
6.	1,2,4,5-Tetrachlorobenzene	0.01	0.03

S. No.	Chlorobenzene	LOD, µg/l	LOQ, µg/l
7.	1,2,3,5-Tetrachlorobenzene	0.01	0.04
8.	Pentachlorobenzene	0.02	0.07
9.	Hexachlorobenzene	0.04	0.12

Figure 7.9 : Cholorobenzenes by High Performance Liquid Chromatograph (HPLC)

7.5 CO-PROCESSING OF WASTE

Co-processing refers to the substitution of primary fuel and raw material by waste; and recovering energy and material from waste. Waste materials used for co-processing are referred to as alternative fuels and raw materials (AFR).

CPCB prepared the Guidelines on co-processing in cement/Power/Steel Industry (Part I: Cement) in February 2010. A protocol was finalized in November, 2010 for monitoring of emission, effluents and residues during the co-processing of waste in cement, power plants & iron & steel sector. Wastes like ETP sludge, Paint sludge, Refinery sludge, Tyre Chips, Plastic Waste, TDI Tar Waste, Spent Solvent, Blended Liquid Waste are being co-processed in Cement Kiln.

Trial run of waste has been performed in three phases viz. pre co-processing, co-processing and post co-processing. Based on various trial runs conducted permission has been granted to 18 cement plants for co-processing of various wastes in cement kiln under Rule 11 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 the year. The quantity of waste co-processed during year 2012-13 is as below:

Year	Approx. Quantity of Hazardous Waste Co-processed (Tons)	Approx. Quantity of Non-Hazardous waste co-processed (Tons)	Approx. total Quantity of waste co-processed (Tons)
2012-13	40,020	2,33,434	2,73,454

The problems of limited capacity of incinerators & secure landfills, high cost of disposal along with restrictions in interstate movement of wastes can be effectively addressed by co-processing of wastes in cement kiln and the technique is having following advantages:

- Reduced emissions of greenhouse gases in order to slow global warming and demonstrate a positive impact on integrated environmental indicators, such as the ecological footprint,
- Conversion of waste into energy as a raw mix component
- Reduced burden on TSDF, Reduction in Energy Cost
- Conservation of fossil fuel resources and Reduced dependence on primary resource markets, Conservation of natural (non-renewable) resources of energy and materials,
- Immobilization of toxic and heavy metals
- Reduction of environmental impacts of the extraction (mining or quarrying), transporting, and processing of raw materials,
- Destruction of waste completely eliminating potential future liabilities.

7.5.1 Indo-Norway Bilateral Co-operation Project on "Recovery of alternative fuels and raw materials and treatment of organic hazardous wastes through co-processing in resource and energy intensive industry"

Conventionally, the hazardous waste is required to be disposed off through incineration or secured land fill depending upon the calorific value of hazardous waste. The co-processing of waste in cement kiln is a new concept which has got advantages such as reduction in green house gas emission, reduced burden on TSDF, recovery of energy / raw material, conservation of fossil fuel & raw material. Keeping in view the expertise of SINTEF, Norway in co-processing a bilateral project was undertaken by Central Pollution Control Board.

About 7.66 million tonnes of hazardous waste is generated in the country, out of which 3.39 MT is landfillable, 3.61 MT is recyclable and 0.65 MT is incinerable. The incineration capacity of 14 common incinerators located in 7 States altogether is about 0.2 MTPA, leaving a deficit of 0.45 MTPA. This gap is likely to be widened leaving in future due to more industrialization and can only be addressed by Co-processing the waste in cement kiln.

The Memorandum of Understanding between SINTEF, Norway and Central Pollution Control Board (CPCB), India on "Recovery of alternative fuels and raw materials and treatment of organic hazardous wastes through co-processing in resource and energy intensive industry in India" was signed on 12.8.2010 and subsequently approved by Ministry of Environment and Forests, Govt. of India on 14.12.2010.

The objective of the programme is to increase the treatment capacity for organic hazardous and industrial waste significantly through co-processing in resource and energy intensive industry in India. In order to achieve the goal, a provision has been made in the MOU to conduct two workshops on “Co-processing of wastes in Cement, TPP and Iron & Steel Industries” every year. Further, to enhance the technical expertise on the subject of co-processing, provision has been made to import training of 12 officials from SPCBs, CPCB and MoEF abroad every year. SINTEF, Norway has to provide technical support and guidance to CPCB for implementation of co-processing of wastes in resource and energy intensive industries. The Following activities were taken up during 2013-2014:

Workshop Co-Incineration of Waste in Various Industrial Sectors Central Zone

The CPCB is promoting the concept of co-processing in industrial sectors like Thermal Power Plants, Cement and Steel for energy and resource conservation. One day National workshop on ‘Co-incineration of Hazardous waste in various industrial sectors in Central Zone was jointly organized by CPCB and SINTEF Norway on November 18, 2013. The warkshy was waymaild by H.E. Amberes of Norwy Mr. Eivind, S Hommr More than 140 participants from various industrial sectors and regulatory bodies attended the workshop. Number of papers, case studies on co-processing/ incineration of hazardous waste in cement plants were presented by the experts, representative of cement industries and regulatory authorities. As a result of regular motivation so far 13,51,471MT hazardous and other wastes (13,16,496 MT in Rajasthan, 32,775MT in Madhya Pradesh and 2,200MT in Chhattisgarh) have been co-processed/co-incinerated in Central Zone.

- A Workshop on Co-processing of waste in Cement Industries, Thermal Power Plants and Iron & Steel Industries in Eastern Region’ was orgnised on 17th January, 2014 at Bhubaneswar. About 79 industry representatives, besides 15 SPCBs officials from UPCBs, MoEF & CPCB Head Office and Zonal Office, Kolkata attended the workshop.

Mr. R.C. Saxena, ZO, CPCB, Kolkata addresing the workshop

Dr. Christian J. Engelsen, Senior Scientist, SINTEF delivering speech

Study tour to Norway was organised for 9 officials of CPCB/SPCBs during November 9-17, 2013.

One day workshop on “Co-processing in the Cement, Steel and Power Industry” was organised jointly by SINTEF, Norway and CPCB at Bhubaneswar on January 17, 2014.

Various technical papers have been published/ acepted in international journals / conferences.

7.5.2 R & D Studies on "Monitoring during Regular Co-processing of Waste in Cement kiln"

A research and development study (of one year duration) was taken up by Central Pollition Control Board with an objective to assess the compliance of emission, Ambient Air Quality (AAQ), characterization of the waste, raw materials & clinker and quality of cement and leachability of heavy metals from clinker in various cement plants. The characterization of waste was carried out quarterly. The leachability tests were conducted for heavy metals in the clinker samples, which were obtained prior to co-processing and during co-processing. The results indicate that the leachability range obtained during the co-processing was at par with that during the pre co-processing period. Hence, no effect on leachability due to co-processing was apparent.

The compressive strength of cement data compiled on monthly basis during the study period indicates no deviation in the compressive strength due to co-processing. The clinker semples analysed for various other parameters like SiO_2, Al_2O_3, Fe_2O_3, CaO, Mg, SO_3 etc. did not indicate any change in concentration of these parameters due to co-processing. Ambient Air Quality was monitored for PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, O_3, NH_3, C_6H_6, Benzo(a) Pyrene, Pb, Ni, As, twice a week for one year. The AAQ was within the National Ambient Air Quality (NAAQ) standards. The emission monitoring was carried out for PM, CO, TOC, NOx, HCl, SO_2, HF, total dioxins and furans, Cd + Tl + their compounds, Hg and its compounds, Sb + As + Pb + Co + Cr + Cu + Mn + Ni + V + their compounds on fortnightly basis for one year. It was observed that PM emission during co-processing was less than the emission standards prescribed by the SPCB. For other pollutants i.e. CO, TOC, NOx, HCl, SO_2, HF, total dioxins and furans, Cd + Tl + their compounds, Hg and its compounds, Sb + As + Pb + Co + Cr + Cu + Mn + Ni + V + their compounds, the emission values during co-processing did not exceed the base line emission values i.e. during pre co-processing period. The studies concluded that there was no adverse effect on the quality of cement, stack emissions and ambient air quality due to co-processing of waste in cement kiln and co-processing of waste is an environmentally sound technology for waste disposal.

7.6 NOISE MONITORING IN AND AROUND NATIONAL PARKS & WILDLIFE SANCTUARIES

National Parks and the wildlife sanctuaries are categorized under silence zone. The Ministry of Environment and Forests (MoEF), Government of India, has notified noise standards for silence zone under the Noise Pollution (regulation and control) Rules, 2000 and its amendments.

In order to assess the compliance status of rules and to determine the effects of noise disturbances, in and around the national parks & wildlife sanctuaries Central Pollution Control Board (CPCB) has taken up a project on "Noise Monitoring in and Around National Parks & Wildlife Sanctuaries of India". Under the project, noise monitoring was undertaken at Wildlife Sanctuaries/National Parks of Kerala between January 18-26, 2014, with an objective to assess the compliance status of standerds notified under the Noise Pollution (Regulation and Control) Rules, 2000. Noise monitoring was condected at six wildlife sanctuaries viz. Idukki Wildlife Sanctuary, Periyar (East) Tiger Reserve and Periyar (West) Tiger Reserve, Eravikulum Wildlife Sanctuary, Thatekad Bird Sanctuary and Chinnar Wildlife Sanctuary. The noise level recorded at these wild life sanctuaries is presented below:

Noise lavel at wild life Sanctuaries at Kerala and Compliance Status

S. No.	Sanctuary	Noise Lavel		Compliance with Noise Rules, 2000*	Remarks
		dB(A) (Min.-Max.)	Leq. in dB(A)		
1.	Idukki Wildlife Sanctuary	37.1-68.5	51.6	Complied	Maximum noise level 68.5 dB(A) was due to the sound of leaves.
2.	Periyar (East) Tiger Reserve	74.8-81.3	76.2	Not complying at boating area but complied inside	Maximum noise level of 81.3 dB(A) was due to boat engine noise
3.	Periyar (West) Tiger Reserve	34.0-59.3	41.3	Complied	Maximum noise level 59.3 dB(A) was due to the sound of leaves.
4.	Eravikulum Wildlife Sanctuary (At Entry Gate)	38.0-79.3	59.9	Noise Norms Violated at entry gate but complied inside	Maximum noise level of 79.3 dB(A) was due to monument of vehicles carrying tourists
	Eravikulum Wildlife Sanctuary (Inside the park during public movement)	33.8-52.2	38.2		
5.	Chinnar Wildlife Sanctuary	41.1-69.0	52.1	complied	Maximum noise level 69.0 dB(A) was due to monument of vehicles carrying tourists
6.	Thatekad Bird Sanctuary	36.1-53.0	40.3	Complied	

Noise standard in silence zone : 50dBA (Day time Leq.)

7.7 IN-SITU SEWAGE TREATMENT

Bioremediation techniques are often applied for curbing pollution in the event of oil sleek, hazardous contamination site and also seen in boosting the STP performance, lake conservation, Groundwater reclamation, odor suppression, etc. In these processes, selected species of microbial consortia are used for treating the water contaminants especially BOD /COD. There is a huge gap in between Sewage generation and treatment facilities in the country. To bridge the gap, Central Pollution Control Board has formulated the concept of In-situ treatment of sewage using bio remediation in open drains for abatement of pollution in recipient water bodies and conducted pilot studies in Ramnagar-Domora Drain, Bharatpur (Rajasthan) and AB Road Drain, Indore (Madhya Pradesh).

The study revealed that In-situ Bioremediation can reduce pollution load upto 50% in terms of BOD, COD and TSS. The technology is cheaper than conventional treatment, which doesn't involve any skilled manpower, heavy machineries, electricity and other recurring cost. Two more such Bioremediation projects are undergoing in Budha Nala, Ludhiana (Punjab) and Bakarganj Nala, Patna (Bihar) under NGRBA/NRCD programme of MoEF.

Green Bridge Technology at BudhaNala, Ludhiana

7.8 DEVELOPMENT OF METHODOLOGY FOR ASSESSMENT OF CO_2 ABSORPTION THROUGH GREEN BELT EMISSION FROM INDUSTRIAL PROCESS AND ITS CARBON BUDGETING IN SELECTED INDUSTRIAL SECTORs

The cement industries are significant contributors to the imbalance in the ambient air quality and reported to produce 5% of total Green House Gases (GHG) in the country. As per the conditions for Environmental Clearance by MoEF, industries have to compulsorily develop green belt in 30% of the total project area to sequester Carbon dioxide, so as to mitigate air pollution.

The project was undertaken to assess green belt area requirement for sequestration of carbon dioxide emitted from the selected cement industry in Karnataka and to identify the species of plants for effective carbon sequestration. In the project, database on plant species (fast growing plants, plants native to the ecological zone) that could be effectively raised in the green belt of industrial area, acts as bench mark for assessing long term benefits and manage the ecosystem are proposed to be identified.

7.9 OPTIMISATION OF CHROME TANNING OPERATIONS

R & D activities aimed at Optimisation of Chrome Tanning operations through Chemical and Process benchmarking was undertaken on pilot basis with tanning process infrastructure support extended by the Tanneries at, Jajmau, Kanpur.

The R & D Activities mainly focussed on :

a. Optimize absorption of chromium in tanning process through Process and Chemical interventions.

b. Restricted Operations from De-liming to Chrome tanning stage comprising different process stages including washing before de-liming, pickling, basification and chrome tanning.

c. Process and Chemical optimization in all the operations undertaken by observing following steps:

(i) Execution of Conventional process with no chemical / process intervention

(ii) Process wherein, conventional de-liming agents (ammonia salts) are substituted and other chemical interventions are incorporated but without improvisation in tanning drum and their configuration

(iii) Improvisation in tanning drum and their configuration along with chemical intervention.

The physics co-chemical parameters included are pH, COD, TDS, alkalinity, chloride and total Chromium in process-specific wastewater the analyses of which was conducted at CPCB zonal office Lucknow laboratory, while characterization of processed hides was conducted by the tannery. Three phases of experiments have been completed during the year and chromium uptake of over 80% has been achieved. Results validation & reproducibility is in prosess.

7.10 ASSESSMENT OF VOLATILE ORGANIC COMPOUNDS (VOCs) IN IDENTIFIED INDUSTRIAL ESTATES OF WEST ZONE

Volatile Organic Compounds (VOCs) monitoring was undertaken in five Chemical Industrial Areas in West Zone i.e. four in Gujarat (Vatva, Ankleshwar, Panoli and Vapi) and one in Maharashtra (Patalganga) for creating baseline data which will help prioriting of potential VOCs, development of standards and subsequent enforcement. VOCs monitoring was conducted in ambient air, surface water, inlets & outlets of CETPs and at selected chemical industries for fugitive emissions and raw wastewater quality during February 2014. The monitored Industrial areas analysis results for VOCs in ambient air, ambient water and CETPs are presented below:

Volatile Organic Compounds (VOCs) in Ambient Air :

Industrial Areas	Site-1	Site -2	Site -3	Site -4	Site -5	Site -6
1	2	3	4	5	6	7
Volatile Organic Compounds						
Vatva, Gujarat	97.2	116.4	43.7	18.6	77.4	26.7
Ankleshwar, Gujarat	152.6	261.4	95.6	76.3	--	--
Panoli, Gujarat	45.3	15.1	16.2	38.8	47.2	--

Vapi, Gujarat	45.8	53.1	97.5	72.6	42.4	21.2
Patalganga, Maharashtra	50	5311.9	3988.5	106.6	158	--

Note: All parameters are in µg/m³

Volatile Organic Compounds (VOCs) in Surface Water:

S. No	Locations	Total VOCs (in mg/L)
1	Kharicut Canal, near Vinjol Bridge, Vatva, Gujarat	268.8
2	ChhapraKhadi, Chhapra Village Road (near Golden Bridge), Ankleshwar, Gujarat	453.7
3	AmlaKhadi , NH-8, Ankleshwar, Gujarat	197.9
4	River Damanganga, at Jari causeway, Vapi-Daman	89.6
5	Bhil Khadi, NH-8, Balitha, Vapi, Gujarat	91.3
6	Patalganga River, Patalganga, after discharge point of CETP, Raigad Dist. Maharashtra	115.0

Volatile Organic Compounds (VOCs) in Infhent & Elthnent of CETPs:

S. No	CETPs	Total VOCs in mg/L	
		Inlet	Outlet
1	CETP, Vatva, Gujarat	--	215.6
2	CETP, Ankleshwar, Gujarat	866	816.4
3	CETP, Panoli, Gujarat	5796.0	9464.7
4	FETP, Ankleshwar, Gujarat	4449.7	1261.1
5	CETP, Vapi, Gujarat	710.6	162.1
6	CETP, Patalganga, Maharashtra	4086	93.9

7.11 PERFORMANCE EVALUATION OF Reverse Osmosis and Multiple Effect Evaporators, INSTALLED AT CHEMICAL INDUSTRIES IN GUJARAT

Gujarat state has high industrial development particularly in chemical sector. The chemical industrial processes obviously generate wastewater which needs to be treated properly so as to meet the prescribed standards. The treatment of wastewater generated by chemical industries with conventional treatment methods is very difficult. Due to strictness of regulatory authorities, necessity of reuse of wastewater, increase in awareness of the industries, availability of technologies, many industries particularly in critically polluted areas have installed Reverse Osmosis (RO) and Multiple Effect Evaporators (MEE). The wastewater generated is treatment subjected to treatment using RO or MEE (different stages) or RO and MEE depending upon characteristics of wastewater.

In Ankleshwar & Panoli Industrial areas, 66 MEEs have been installed by 55 industries and 04 MEEs in four industries are under installation/commissioning stage. 38 industries have installed 44 ROs. Common MEEs have been set up at Naroda, Vatva and Ankleshwar Industrial areas for small scale industries generating wastewater with high TDS & COD. Four different category of industries (pharmaceuticals, pesticide, dyes & dyes intermediate) and a common MEE facility located in Critically Polluted Areas Ankleshwar & Panoli Industrial Areas were monitored for their performance evaluation.

It was observed that the treated wastewater/permeate/condensate is being reused in the process/plants. About 8 to 10 MLD of permeate from RO and condensate from MEE is now being reused as per the information provided by Gujarat Pollution Control Board. The concentrate from MEEs after drying/concentrating through ATFD/Centrifuge/Belt Filter is sold as by product or sent to TSDF for disposal.

7.12 Trace Metal characterization of waste water and sludge generated from CETP's using Inductively Coupled Plasma- Optical Emission Spectrometer (ICP-OES).

The anthropogenic activities are influencing the heavy metal loading of the environment and of concern since several trace metals are toxic in nature. The main sources of the Trace metals in the environment are geochemical and industrialization. The waste water generated from various CETP's after treatment process is discharged into rivers, streams, land, marine water and coastal areas and this treated water as well as sludge generated contains various toxic Metals. The production, processing and consumption of various metals and Metallic species during various manufacturing processes are not only hazardous but may also have an adverse environmental effect because metals are non biodegradable and persist in the environment.

In order to assess the quality of waste water and sludge generated from CETP's the trace metals have been analyzed regularly by ICP-OES for qualitative estimation. The detection of trace metals are accomplished by various methods such as colorimetric, polarographic, atomic absorption spectrophotometric & ICPO techniques but trace metals analysis using ICP-OES is relatively simple, accurate, versatile and free from interferences. Waste water and sludge samples from inlet and outlet of CETPs Narayana, Mayapuri and Jhilmil were collected and analyzed by ICP-OES for metals such as As, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Sb, Se, V & Zn etc. The analytical results (Table 7.6) indicates presence of trace metals such as Cr, Cu, Fe, Mn in samples of Narayana, Mayapuri and Jhilmil CETP`s waste water (inlet and outlet) while As, Cd, Co, Se and V were Below Detection Limit. The sludge samples collected from all the three CETPs contain metals like Cr, Cu, Fe, Mn, Ni, Pb, V and values given below:

Metal Concentration in influent and effluent of CETPs

S. No	CETP	As mg/l	Cd mg/l	Co mg/l	Cr mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Ni mg/l	Pb mg/l	Sb mg/l	Se mg/l	V mg/l	Zn mg/l
1.	Narayana Inlet	BDL	BDL	BDL	0.60	0.90	11.8	0.20	0.42	0.12	BDL	BDL	BDL	1.70
2.	Narayana Outlet	BDL	BDL	BDL	BDL	0.07	2.06	0.17	BDL	BDL	BDL	BDL	BDL	BDL
3.	Mayapuri Inlet	BDL	BDL	BDL	0.78	2.76	29.4	0.57	0.46	0.28	BDL	BDL	BDL	5.49

4.	Mayapuri Outlet	BDL	BDL	BDL	0.18	0.60	5.65	0.24	BDL	0.12	BDL	BDL	BDL	1.00
5.	Jhilmiil Inlet	BDL	BDL	BDL	15.8	21.6	13.9	0.74	6.19	1.39	0.12	BDL	BDL	9.61
6.	JhJhilmiil Outlet	BDL	BDL	BDL	0.17	0.17	1.25	0.33	BDL	BDL	BDL	BDL	BDL	BDL

Metal Concentration in CETP`s Sludge

S. No	CETP	As mg/g	Cd mg/g	Co mg/g	Cr mg/g	Cu mg/g	Fe mg/g	Mn mg/g	Ni mg/g	Pb mg/g	Sb mg/g	Se mg/g	V mg/g	Zn mg/g
1.	Narayana (Sludge)	BDL	BDL	.009	1.50	3.10	35.20	0.128	0.646	0.110	BDL	BDL	0.108	3.700
2.	Mayapuri (Sludge)	BDL	0.04	BDL	1.80	3.14	46.60	0.507	0.425	0.440	BDL	BDL	0.019	3.800
3.	Jhilmiil (Sludge)	BDL	BDL	.007	32.90	31.60	102.o	0.576	9.100	1.800	0.091	BDL	0.019	14.00

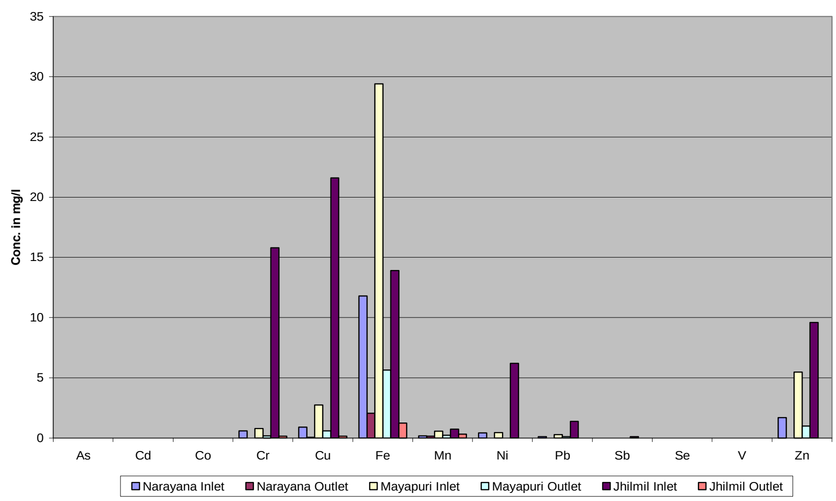


Figure 7.10 : Trace Metals in influent and effluent CETPs

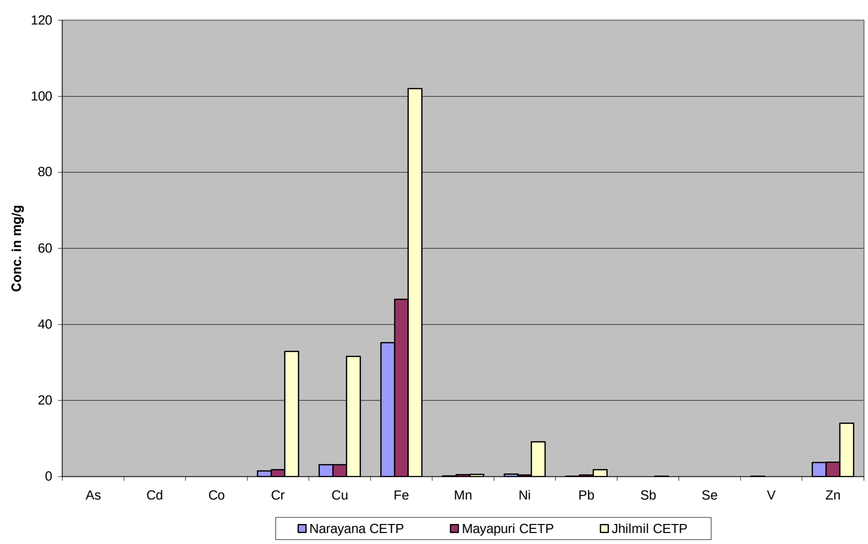


Figure 7.11 : Trace Metals in CETPs sludge

7.13 INTER-LABORATORY PROFICIENCY TESTING (PT) PARTICIPATION FOR ANALYSIS OF PHYSICO-CHEMICAL AND TRACE ORGANICS PARAMETERS INCLUDING DIOXIN & FURAN

Quality system includes quality assurance policies and all quality control processes to ensure the quality of analytical data produced by the laboratory and to demonstrate the competence of the laboratory. Quality assurance is the definite programme for laboratory operation that specifies the measures required to produce reliable data of known precision and accuracy. The accuracy of analytical results plays an important role in correctness of decisions or action. If analytical errors in results are higher, the manpower, material and money spent by the laboratory to generate analytical results would be futile and further lead to wrong decisions and improper actions.

Analytical Quality Control (AQC) is one of the main component of Quality Assurance (QA) System, wherein the Quality of analytical data generated at a laboratory is controlled through minimizing analytical errors for achieving target analytical accuracy. To maintain analytical data quality, the laboratories have to undertake Internal Proficiency Testing / Quality Control (within the laboratory) as well as participate in Inter Laboratory Comparison (ILC) / Proficiency Testing (PT) Programme (conducted preferably by International PT provider / External agency).

The satisfactory results in PT Participation ensure that the quality of analytical data generated by the laboratory are satisfactory & reliable and thereby boost the confidence of the analysts. The successful ILC / PT participation provides direct evidence that the required accuracy of analytical results has been achieved and quality is maintained by respective laboratory.

During 2013-2014, the Central Pollution Control Boards Central Laboratory-HQs and-its five Zonal Office Laboratories participated in the following International PT programmes:

- M/s Environmental Resource Associates (ERA), Table Mountain Parkway, Golden, CO 80403, USA (Accredited with American Association for Laboratory Accreditation, A_2LA)
- **United Nations Environment Programme (UNEP) GEMS/Water** - PE Study No. 08 - Coordinated by Global Proficiency, Hamilton, New Zealand 3241.

The Proficiency Testing (PT) samples forwarded by PT providers were received at Central Laboratory HQs and Zonal Office Laboratories of Central Pollution Control Board during November / December, 2013. The PT samples were analyzed adopting routine analytical procedure at respective laboratories and the analyzed data reported to PT Coordinating Agencies at USA and New Zealand. The PT providers after statistically processing the reported data from various participating laboratories located in various regions of world, provided PT reports in January / February, 2014, which constitute PT results of respective laboratories in terms of 'Z' Score given in the table.

The PT proficiency of the laboratory is universally evaluated by PT providers based on the Z Score secured by the laboratory for respective parameters. The Z score between ± 00.00 to 2.00 are recognized as Good Results, while Z Score between ± 2.00 to 3.00 are recognized as Opportunity and Z score above ± 3.00 are Unsatisfactory and Matter of Concern. The PT results beyond ±2.00 Z score indicate analytical performance of respective parameters requires Root Cause analysis and Corrective Action. Root Cause analysis and Corrective Action are being undertaken by respective laboratories for such parameters.

Performance of Central Pollution Control Board's HQ Laboratory, in Proficiency Testing / Inter Laboratory Calibration

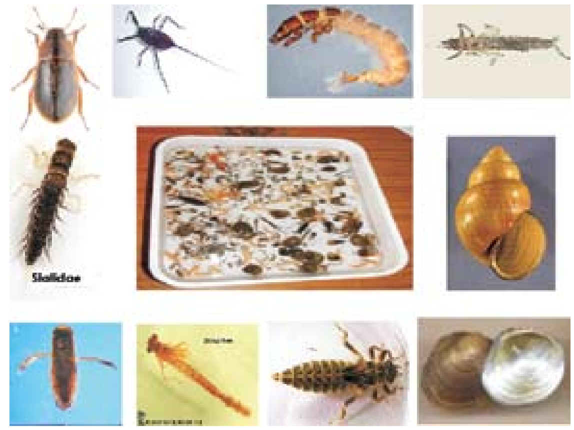
S. No.	EQAS/ PT providers (or) ILC/ coordinating laboratory	Details of Test		*Z* Score/ En Value / SDI
		PT No.	Parameters	
Air Laboratory				
1	M/s ERA Mountain Parkway Golden, CO 80403 USA Accreditated with A_2LA (American Association of Laboratory Accreditation)	AE026 Nov 2013	Arsenic (AE Metals on Filter Paper)	-3.73
			Cadmium (AE Metals on Filter Paper)	1.11
			Chromium (AE Metals on Filter Paper)	-1.30
			Copper (AE Metals on Filter Paper)	-1.62
			Lead (AE Metals on Filter Paper)	-0.394
			Manganese (AE Metals on Filter Paper)	-1.4
			Nickel (AE Metals on Filter Paper)	0.383
			Zink (AE Metals on Filter Paper)	4.38
			NOx (AE Nitrogen Oxides in Impinger Solution)	-1.11
			Sulfur dioxide (AE Sulfur dioxide in Impinger Solution)	-1.38
			Particulate matter (AE Particulate Matter on Filter Paper)	0.685
	Bio-Science Laboratory			
1.	M/s ERA Mountain Parkway Golden, CO 80403 USA	WS-207 Nov 2013	Total Plate Count	1.12
			E-coli (MPN)	-1.16
			Total Coliform	1.43
			Faecal Coliform	0.939

S. No.	EQAS/ PT providers (or) ILC/ coordinating laboratory	Details of Test		Z Score/ En Value / SDI	
		PT No.	Parameters		
2.	UNEP/GEMS Water (PE) Study No 8 Organized by GEMS-Water	PE08 Microbial Dec 2013	Microbiological Parameters	QC	PE
			Potable – MPN E. coli MPN/100ml	-0.29	0.07
			Potable - MPN E. coli MPN/100ml	-0.29	0.07
			Potable - MPN E. coli MPN/100ml	-0.29	0.07
			Potable – MPN Enterococci MPN/100 ml	0.65	-0.62
			Potable - MPN Enterococci MPN/100 ml	0.65	-0.62
			Potable - MPN Enterococci MPN/100 ml	0.65	-0.62
			Potable – MPN Faecal Coliform MPN/100ml	0.00	0.72
			Potable - MPN Faecal Coliform MPN/100ml	0.00	0.72
			Potable - MPN Faecal Coliform MPN/100ml	0.00	0.72
			Potable – MPN Faecal Streptococci MPN/100ml	-0.14	0.22
			Potable - MPN Faecal Streptococci MPN/100ml	-0.14	0.22
			Potable - MPN Faecal Streptococci MPN/100ml	-0.14	0.22
			Potable – MPN Total Coliform MPN/100ml	0.00	0.14
			Potable - MPN Total Coliform MPN/100ml	0.00	0.14
			Potable - MPN Total Coliform MPN/100ml	0.00	0.14
	Instrumentation Laboratory				
1.	M/s ERA Mountain Parkway Golden, CO 80403 USA	WP-225 Nov 2013	Mercury	0.456	

S. No.	EQAS/ PT providers (or) ILC/ coordinating laboratory	Details of Test		Z Score/ En Value / SDI	
		PT No.	Parameters		
2	UNEP/GEMS Water (PE) Study No 8 Organized by GEMS-Water	PE-08 Chem December 2013	Metal Parameters	QC	PE
			Cadmium µg/L	-1.55	0.32
			Chromium Total µg/L	-5.13	-2.68
			Copper µg/L	-1.89	-2.21
			Iron µg/L	7.27	5.41
			Lead µg/L	-1.27	4.96
			Manganese µg/L	-1.65	-0.30
			Mercury µg/L	2.60	0.15
			Nickel µg/L	-1.64	-1.62
	National Reference Trace Organics Laboratory				
1	M/s ERA Mountain Parkway Golden CO 80403 USA Accredited with A 2 LA (American Association of Laboratory Accreditation)	WP-225 Nov 2013	Organo-Chlorine Pesticides (OCP)		
			4,4'-DDE	-3.26	
			4,4'-DDT	-1.09	
			Aldrin	-1.23	
			alpha-BHC	0.0727	
			beta-BHC	1.01	
			delta-BHC	0.464	
			Dieldrin	-0.799	
			gamma-BHC (Lindane)	0.0129	
			Organo-Phosphorous Pesticides (OPP)		
			Chlorpyriphos	-0.458	
			Dimethoate	0.43	
			Ethion	-0.881	
			Malathion	1.39	
			Methyl Parathion	1.97	
			Polychlorinated Biphenyls (PCBs)		
			Aroclor 1242	1.22	
Water Laboratory					

S. No.	EQAS/ PT providers (or) ILC/ coordinating laboratory	Details of Test		Z Score/ En Value / SDI	
		PT No.	Parameters		
1	M/s ERA 16341, Table Mountain Parkway Golden, CO 80403 United States of America Accredited with A_2LA (American Association of Laboratory Accreditation)	WP-225 Nov 2013	Boron	2.12	
			Calcium	0.466	
			Calcium Hardness as CaCO3	0.508	
			Magnesium	-3.27	
			Total Hardness as CaCO3	-1.87	
			Total Suspended Solids	-2.19	
			Hexavalent Chromium	-0.772	
2.	GEMS, UNEP	PE-08 Chem Dec 2013	Chemical Parameters	QC	PE
			Alkalinity(total) as $CaCO_3$ mg/L	1.20	0.84
			Ammonia Nitrogen as N mg/L	0.28	0.96
			Biochemical Oxygen Demand (BOD) mg/L	0.25	-0.41
			Calcium mg/L	0.20	1.15
			Chemical Oxygen Demand (COD) mg/L	-2.16	-0.32
			Chloride mg/L	0.79	1.51
			Conductivity µmhos/cm	-0.44	0.42
			Fluoride mg/L	0.59	-0.46
			Magnesium mg/L	-0.22	-1.47
			pH – Standard pH units	-3.11	-1.70
			Sulfate mg/L	-0.55	-1.20
			Total Dissolved Solids, Minerals mg/L	-0.64	-0.86
			Total Dissolved Solids, Solids mg/L	0.59	0.68
			Total Hardness as $CaCO_3$ mg/L	0.36	0.02
			Total Kjeldahl Nitrogen (TKN) mg/L	-0.65	1.05
			Total Organic Carbon (TOC) mg/L	0.03	0.61
			Total Phosphorus as P (TP) mg/L	0.48	-1.12
			Total Solids mg/L	-1.28	0.63
			Total Suspended Solids mg/L	0.57	0.25
			Zinc µg/L	4.73	4.26

5.1.6 : Inter laboratory comparison for Bio-monitoring of water quality



Physicochemical parameters of water bodies always indicate time specific quality of water. The impact of various pollutants on the ecology of water body is reflected through biological parameters. The study of biological parameters (Bio-monitoring) always depicts long term impact of pollutants in terms of water quality criteria and class of water. Bio-monitoring is one of the most effective methods of determining water quality classes through identification of benthic macro invertebrates belonging to classification groups Mollusca, Annelida, Platyhelminthes, Nemathelminthes and Arthropoda- (Crustacea and Insecta).

The water quality of various rivers is identified based on number of identitied benthic invertebretes encountered at particular location in the river. In case of changes in the water quality, there is abrupt change in the benthic invertebrate families of habitating a particular stretch.

7.14 RECOGNITION OF LABORATORIES UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

Central Pollution Control Board, Delhi has been delegated powers by Government of India vide Gazette Notification No. SO 145 (E) dated February 21, 1991 for recognition of environmental laboratories of Govt. / Semi Govt. organization Public Sector Undertaking and Educational Institutions under section 12(1)(b) & 13 to carry out the functions entrusted to the Environmental laboratories under the Environment (Protection) Act, 1986.

Ministry of Environment & Forests constituted the Expert Committee at Central Pollution Control Board for the purpose. The Central Pollution Control Board organized seven (7) meetings of Expert Committee for laboratory recognition during 2013-2014 as below for assessment, review and recommendation of cases of private / government sector laboratories for recognition under the Environment (Protection) Act, 1986.

- 32nd Meeting of Expert Committee - 12.04.2013
- 33rd Meeting of Expert Committee - 27.05.2013
- 34th Meeting of Expert Committee - 05.08.2013
- Emergency Meeting of Expert Committee - 03.09.2013
- 35th Meeting of Expert Committee - 23.10.2013

- 36th Meeting of Expert Committee - 29.11.2013
- 37th Meeting of Expert Committee - 04.02.2014

Private Sector Laboratories Reference from MOEF Applications Evaluation

Central Pollution Control Board, Central Laboratory evaluated the applications of following private laboratories forwarded by MoEF for comments for consideration of new renewal of recognition under the Environment (Protection) Act, 1986 during 2013 – 2014.

(a) New Recognition Applications

- M/s Environmental & Industrial Research Laboratory, Tumkur, Karnataka
- M/s Spectro Integrated Labs Pvt. Ltd., Thrissur-680013, Kerala
- M/s Prakriti Consultants Services, Lucknow, U. P.
- M/s TUV SUD South Asia Pvt. Ltd., New Delhi
- RCA Laboratories, (A division of Dr. Amin Controllers Pvt. Ltd.), Mumbai
- M/s Bhagavati Ana Labs Pvt. Ltd., Hyderabad, Andhra Pradesh
- M/s Siddhi Consultants, Ankleshwar, Gujarat
- M/s Trans Thane Creek Waste Management Association Laboratory, Navi Mumbai, Maharashtra
- M/s Fare Labs Pvt. Ltd., Gurgaon-122022, Haryana
- M/s Envomin Consultant Pvt. Ltd., Plot No. 3054/9625, Saptasati Vihar, Pandra, Bhubaneswar-751 010, Odisha
- M/s Environmental Laboratory, District Solan, Himachal Pradesh
- M/s Navega Enviro Engineers & Consultants, Madhapur, Hyderabad, Andhra Pradesh
- M/s Kiwis Eco Laboratories Pvt. Ltd., Rangareddy District, Andhra Pradesh
- M/s Savant Envitech Pvt. Ltd., Hyderabad- 500072, Andhra Pradesh
- M/s Edward Food Research & Analysis Centre Limited (EFRAC), Distt:North 24 PGS, Kolkata-700121
- M/s CEG Test House & Research Centre Pvt. Ltd., Jaipur-302017
- M/s ABC Techno Labs India Private Limited, Ambattur, Chennai-600 058, Tamil Nadu

(b) Renewal of Recognition Applications:

- M/s Mitra S. K. Private Limited (Behala Laboratory), Kolkata - 700034
- M/s J. M. Envirolab Pvt. Ltd., Gurgaon-122 001, Haryana
- M/s SGS India Pvt. Ltd. Kolkata – 700104, West Bengal
- M/s Envirodesigns Eco Labs Kochi- 682025, Kerala
- M/s Bhagavati Ana Labs Ltd., Sanathnagar, Hyderabad, Andhra Pradesh

- M/s Enviro Analyst and Engineers Pvt. Ltd., Dist. Thane, Maharashtra
- M/s SGS India Private Ltd., Multi Laboratory, Chennai- 600058, Tamil Nadu
- M/s Pragathi Labs & Consultants Pvt. Ltd., Secunderabad, Andhra Pradesh
- M/s Sesa Environment Laboratory, Sesa Goa Ltd., Goa- 403727
- M/s Sargam Laboratory Pvt. Ltd., Guindy, Chennai
- M/s Standard Analytical Laboratory (ND) Pvt. Ltd., Delhi
- M/s Scientific Research Laboratory, Santoshpur, Kolkata
- M/s Akanksha Analytical & Research Lab, Pune, Maharashtra
- M/s SGS India Private Ltd., Multi Laboratory, Chennai, Tamil Nadu
- M/s Mahabal Enviro Engineers Pvt. Ltd., Nagpur
- M/s Vison Labs., Malakpet, Hyderabad-500036, Andhra Pradesh

7.15 JOINT INSPECTIONS OF PRIVATE AND GOVERNMENT LABORATORIES FOR CONSIDERATION OF NEW/ RENEWAL OF RECOGNTION UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

Central Pollution Control Board participated in joint inspection of private laboratories along with Ministry of Environment & Forest (MoEF) and respective State Pollution Control Boards for consideration of recognition of private environmental laboratories under the Environment (Protection) Act, 1986. Central Pollution Control Board-H.O. also coordinated & participated in joint inspection of government sector laboratories along with State Pollution Control Board/ CPCB Zonal Offices for consideration of their recognition under the Environment (Protection) Act, 1986 during the year.

7.16. ANALYTICAL QUALITY CONTROL PROGRAM FOR CENTRAL AND STATE POLLUTION CONTROL BOARDS, POLLUTION CONTROL COMMITTEES AND FOR LABORATORIES RECOGNISED UNDER THE ENVIRONMENT (PROTECTION) ACT.

Central Pollution Control Board (CPCB) has to maintain vast water quality monitoring network with the aim to evaluate the status of water quality of various water sources. The National level monitoring is undertaken at 2500 water quality monitoring sites under GEMS, MINARS, GAP and YAP Programmes comprising rivers, lakes, wells, and ground waters spread over 27 States and 6 Union Territories through various State Pollution Control Boards (SPCB). Comparability of data within the collaborative programme becomes the key challenge to the water testing laboratories. The quality of data must be of the desired quality for policy formulation by the decision makers. To obtain relevant and reliable data, the analytical process has to proceed under a well established quality assurance system with external proficiency test as an inherent component. To ensure the reliability of the data, “Analytical Quality Control (AQC)” was initiated with 20 laboratories during year 1991. In 2013-14, the number of SPCB/PCC laboratories participating in this exercise reached to 212 of SPCB/ PCC. The growth of AQC programme is given in figure 7.12. As on 28th Feb 2014, 30 rounds of exercises have been conducted and performance reports released. There are 10 physico-chemical parameters and 6 heavy metal parameters covered under the 29th & 30th AQC exercise (Table 7.9). The performance of the laboratories in the 29th Exercise for physico-chemical parameters is presented in Fig. 7.13

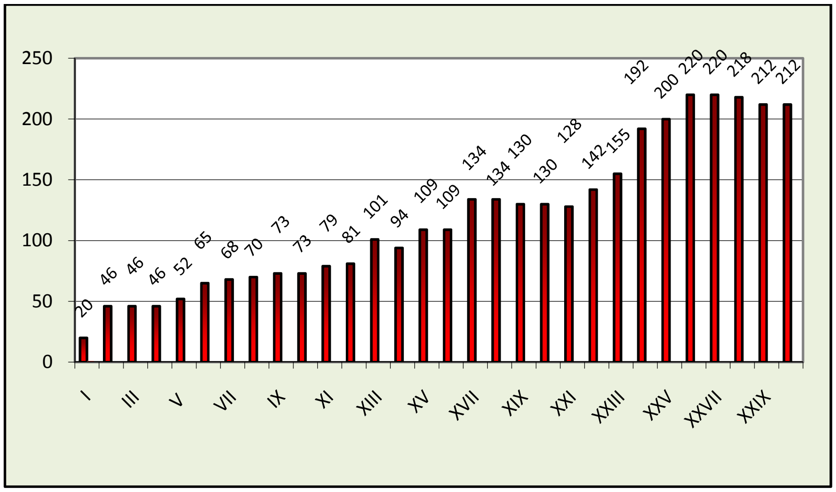


Figure 7.12 : Growth of AQC/ Water Programme (1991-2014)

Two synthetic samples labeled as A & B each of 1 litre volume were prepared in the laboratory by adopting standard procedures and distributed to all participating laboratories through Courier service to avoid any transport delay. Samples were also analyzed in CPCB laboratory for arriving at "Reference value" for comparison and to estimate the acceptable limits of the reported values.

List of Parameters Covered under AQC / Water Programme (29th & 30th) Exercise during 2013

S. No.	Parameter	S. No.	Parameter
1.	Total Dissolved Solid (TDS)	11.	Iron(Fe)
2.	Fixed Dissolved Solids (FDS)	12.	Cadmium (Cd)
3.	Total Kjeldahl Nitrogen (TKN)	13.	Copper (Cu)
4.	Ammonical-N	14.	Manganese (Mn)
5.	Sodium	15.	Nickel (Ni)
6.	Potassium	16.	Lead (Pb)
7.	Phosphate-P		
8.	Chemical Oxygen Demand (COD)		
9.	Biochemical Oxygen Demand (BOD)		
10.	pH		

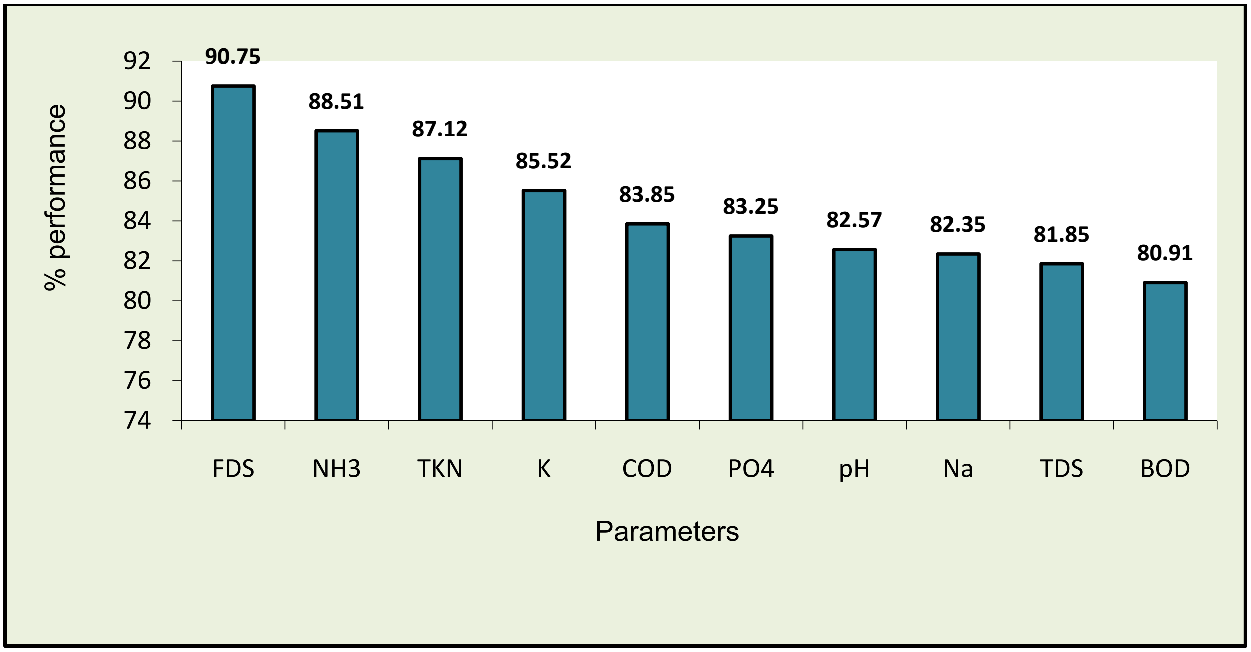


Figure 7.13 : Performance Evaluation of Laboratories of SPCB/PCC/ approved under E/(P) Act. in 29th AQC Programme Conducted During 2013

The overall findings in the performance of AQC exercises reveal the fact that Internal AQC system at all the laboratory needs strengthening. The analytical capability of these laboratories could be improved by adopting following major steps.

- Adopting good quality assurance system
- Strengthening of the Internal AQC System
- Periodic calibration of instruments
- Using high quality chemicals and providing adequate quantity of glassware
- Providing good quality distilled water
- Improving the laboratory work atmosphere
- Providing analytical training to laboratory analysts.
- Conducting Regional Workshop at various regions
- Participaton in Inter-laboratory AQC exercises by all laboratories of Pollution Control Boards and Committees.

7.16 LABORATORY DEVELOPMENT

Development of the laboratory at ZO-Bengaluru

To undertake field investigations and preparation of reports on water quality monitoring, air quality monitoring, industrial inspection and many other related activities, CPCB has established laboratories with proper analytical facilities.

- The laboratory at CPCB ZO Bengaluru is upgraded and strenthened to meet the statutory requirements of monitoring & analysis works. Efforts are underway for obtaining Accreditation of laboratory as per ISO & NABL. The major achievements during this year includes;

- The laboratory participated in two international Proficiency Testing programmes and two national Proficiency Testing programmes and achieved 95% and 99% accuracy respectively.
- All major instruments were entered into regular Annual Maintenance Contract to ensure their regular working.
- Development of facility for Calibration of Ambient / Air / Emission Monitoring Instruments and Equipment (Ring Test Facility)

The required space has been furnished for establishing Ring Test facility. Gas handling pipelines and glass pipelines with 12 ports and static volumetric dilution system have been installted, oil free mechanical vacuum pump (5 to 21m^3/hr) has to be purchased for making the ring test facilities operational.

Accreditation/Recognition of zonal office – Bangalore laboratary

NABL accreditation is a pre-requisite for recognition of the Laboratory as environmental lab under the Environment (Protection) Act, 1986. The development of necessary documentation is under progress. The awareness programme for staff completed while Calibration of instruments and Glassware, Measurement of uncertainty etc., have been vigorousty taken up. The recognition of laboratory under ISO 9001:2008 and OHSAS 18001:2007 are also under progress. The accreditation of laboratory will streamline the procedures/activities and add credibility as environmental lab.

Development of laboratory at zonal office - Bhopal

- The Zonal Office, Bhopal laboratory is equipped with AAS, UV spectrophotometer, mercury analyzer Gas Chromatograph (GC) etc. Regular calibration and up keep of the equepment is ensured for round the clock operation of laboratory and generation of quality analyticaly data.
- The laboratory has been participating in National and International Proficiency Testing programmes and scored 95% performance in International AQC conducted by ERA-USA an American organization and scored 83% performance in PT Programme conducted by UNEP GEMS.

Development of Zonal Office Laboratory, Lucknow

- The laboratory regularly undertakes processing and analysis of environmental samples for various parameters.
- The Laboratory of CPCB zonal office , Lucknow is an NABL Accredited testing facility in accordance to International Standard ISO/IEC 17025: 2005. During the year, desk top audit of the laboratory has been conducted by NABL and internal Audit has also been conducted by the internal auditors duly authorized by the NABL. The non-conformities raised during internal audit have been addressed and corrective action taken.

- The reliability of the data generated by the laboratory is regularly ensured through various quality control exercises which include execution of Internal AQC Programme, participation in national and international proficiency testing programmes, regular calibration of equipment/instruments etc. The performance of the laboratory in proficiency testing programmes during the year is as followes;
  - Participated and achieved 81.8% performance in Water Testing Programme conducted by M/s ERA, A Waters Company in United States of America.
  - Participated and achieved 86.8% in AQC Exercise conducted by UNEP – GEMS. The corrective action for the concern parameters have been taken.
  - Participated and achieved 100% performance in XXX AQC Metal Exercise conducted by CPCB, Delhi.
  - Participated in Inter-Laboratory Comparison (ILC) programme for chemical parameters conducted by Central Ground Water Board, Lucknow.

The laboratory is regularly adopting new analytical methods, procuring latest instrument/equipment and adopting standard analytical.

Development of Laboratory at zonal office - Vadodara

The laboratory of Central Pollution Control Board zonal office – Vadodara is equipped with the sophisticated instruments and capable to analyze various environmental parameters such as physico-chemical, parameters microbiological, parameters, pesticides & Heavy metals in source samples, fugotive emission and ambient air samples. During the year the laboratory has been further strenghthend and upgraded by installation of Ozone generator/Permeation system, Multi Calibration system, Flue Gas analysers, Laminar Flow, Mechanical Shaker, Digital Colony Counter, Noise level meters, vacuum Pump, Ambient Air Quality Analysers etc. The laboratory has received and analyzed 285 Nos. of water and wastewater samples for various physico-chemical parameters and 487 Nos. of sources & Ambient air samples for analysis during the year.

The Laboratory participated in the international proficiency testing programme by ERA, USA. The performance was 100% for air and 90% for water parameters/samples. Also participated in proficiency testing progamme conducted by UNEP-GEMS and analysis of PT and PE water samples provided by GEMS, The performance of the laboratory was found 90% for water samples.

Implementation of quality systems ISO 17025, OH & SMS and ISO 9001 in CPCB laboratories

To fulfill the requirement for authorization under EP (1986) Act all the laboratories of CPCB are in in the process of obtaining certifications under IS 9001 or IS 18001 and accreditations under ISO 17025. In this matter the management of CPCB have identified technical manager, quality manager and Management Representative. The CPCB also identified nodal officers for implementation of these programs in respective HQs Zonal Office laboratories. A two-day internal auditor's programs as per IS 18001 was also organized. The quality standards being adopted in CPCB laboratories are as under:

S. No.	Laboratory	Quality Systems Adoption
1	Central Laboratory consisting of Air Laboratory-I, Bio-science Laboratory, Instrumentation Laboratory, Trace Organics Laboratory, Water & waste water laboratory	IS 17025 OH & SMS IS: 18001 Recognition under E (P) act 1986
2	Zonal Office Lucknow	OH&SMS IS: 18001 & IS 17025
3	Zonal Office Kolkata	OH&SMS IS: 18001 & IS 17025
4	Zonal Office Bhopal	OH&SMS IS: 18001 & IS 9001
5	Zonal Office Bengaluru	OH&SMS IS: 18001 & IS 9001
6	Zonal Office Vadodara	OH&SMS IS: 18001 & IS 9001
7	Zonal Office Shillong	OH&SMS IS: 18001 & IS 9001

Activities at Central Pollution Control Board HQs laboratories related to Accreditation as per ISO/IEC 17025 : 2005 (NABL Accreditaon)

- Internal audit of CPCB Central Laboratory conducted during October 2013.
- Management Review meeting organized on 30th October 2013 and again on 10th march 2014.
- Quality Manual 2014 prepared and issued in March 2014 to Central Laboratory and others.
- 17 sample receiving format and 19 analysis report format issued.
- Standard Operating Procedures (SOPs) and work instructions prepared by respective laboratories and issued as control document to all laboratories for all parameters.
- Application for renewal for NABL accreditation under ISO: 17025 forwarded.
- Information related to NABL accreditation of Central Laboratory HQs has been uploaded on CPCB Website

Publications of research papers by Central Laboratory CPCB HQs

- Environmental and human health risk assessment of benzo(a)pyrene levels in agricultural soils from the National Capital Region, Delhi, India. *Human and Ecol Risk Assess: An Int Journal*, 2013,19 (1): 118-125.
- Distribution of dichlorodiphenyltrichloroethane and hexachlorocyclohexane in urban soils and risk assessment. *Journal of Xenobiotics*, 2013, 3:1-8.

- Probable health risk assessment of polycyclic aromatic hydrocarbons and polychlorinated biphenyls in urban soils from a tropical city of India. *Journal of Environ Sci Health, Part A: Toxic/Hazard Subst Environ Eng*, 2013, 48:10, 1253-1263.
- Preliminary Analysis of Polycyclic Aromatic Hydrocarbons in Air Particles (PM_{10}) in Amritsar, India: Sources, Apportionment, and Possible Risk Implications to Humans. *Arch Environ Contam Toxicol*, 2013, 65:382–395.
- Ecotoxicological Risk Assessment of Polychlorinated Biphenyls (PCBs) in Bank Sediments from along the Yamuna River in Delhi, India. *Human Ecol Risk Assess: An Int Journal*, 2013, 19:6, 1477-1487.
- Validation of HPLC Method for Determination of Priority Polycyclic Aromatic Hydrocarbons (PAHs) in Waste Water and Sediments. *Advances in Applied Science Research*, 2014, 5(1):201-209.
- "Study of Ambient Noise Pollution during Deepawali festival at different locations in India" has been prepared and forwarded to NGT journal.
- A Paper "Ambient Air Polycyclic Aromatic Hydrocarbon In Agra City, India" in the national Indian Journal of Air Pollution Control, Vol.XIII, No.1&2, March & Sept., 2013, page no.34-42,
- Published one paper in Rajbhasa Hindi entitled "Agra Shahar ki Pariveshiy Vayu Gunvatta Prabodhan: 2002-2012-ek adhyayan" in the national magazine of Nagar Rajbhaksha Karyanvayan Samiti, Agra (NARAKAS), No.9, 2012-13, page no.59-62.
- One paper in Rajbhasa Hindi entitled "Agra Shahar ki Pariveshiy Vayu Gunvatta Prabodhan: 2002-2013-ek adhyayan" submitted in the national magazine of Nagar Rajbhaksha Karyanvayan Samiti, Agra (NARAKAS)
- One paper "Ground Water Quality of Agra City, Uttar Pradesh" submitted in the 'Environmental Pollution Control Journal' (ISSN 0972-1541).
- One paper "Occurrence of Different Water Soluble Ions in Rain water at Agra City", submitted for review to HO.

CHAPTER VIII

ENVIRONMENTAL TRAINING

Major Activities during 2013-14

Need for Training

- Training is required for increasing the knowledge base and skills of officials at each level and helps to broaden the horizons of human intellect resulting in overall personality development of the officials.
- It helps in increasing the productivity of the officials which strengthes the organization in achieving its long term goal.
- A well structured training programme helps in creating a continuous learning culture within the organization and helps in building positive perception and feeling about the organization.
- Training aids in organizational development i.e. organization gets more effective in decision making and problem solving.
- To develop the knowledge and skills in the field of health, safety & environmental education, research & development and also that of training institutes.

Thus, Training has to be an integral part of the organisation and is a continuous endeavour for enhancement of skills and awareness about new developments that helps in the growth of the organisation.

Major Activities

- Three training programmes were organised through training institutes i.e. CENC-Patna, ESCI-Hyderabad and PCRI-Haridwar during the year 2013-14 in the following areas:
  - Bio Medical Waste Management
  - Design, Operation & Maintenance of STPs/CETPs and CBMWTF
  - Lake Eutrophication, Remediation and Restoration
- Approximately sixty officials from CentralPollution Control Board, State Pollution Control Boards/Committees benefited from the training.
- Twenty five CPCB officials were nominated for training programmes organized by other organizations.
- Eighteen CPCB officials particepated in international training programmes/ workshop/seminars etc. during 2013-14 sponsored by other organizations.

- Around eighty school children were imparted Vocational Educational training programme during 2014, in coordination with Aravali Foundation for Education with the support of Dept. of Environment, Delhi Govt.
- As a yearly routine process, college students were trained in the field of industrial pollution control as their specialized subjects during their winter and summer vacation.

Organization of Refresher Courses on Source Emission Monitoring

CPCB organized 'Refresher Courses on Source Emission Monitoring' at its Zonal Offices at Bhopal & Kolkata during March 2014 for benefit of respective SPCBs/PCCs while more refresher courses are planned at remaining zonal offices.

CHAPTER IX

ENVIRONMENTAL AWARENESS AND PUBLIC PARTICIPATION

9.1 List of publications printed during the year 2013-14

1. Adoption of cleaner practices in SME clusters : Textile (wet) Processing
2. Adoption of cleaner practices in SME clusters : Tanneries
3. Adoption of cleaner practices in SME clusters : Used & Waste Oil Management
4. Pulp and paper industries in Ganga River Basin, water recycling and pollution prevention
5. Performance evaluation of sewage treatment plant under NRCD
6. Assessment of vehicular pollution problems due to devotees / tourists at religious / tourist places & development of vehicular pollution control and ambient air quality management plan & Kumbh Mela 2010 (Peak & Lean seasons : Haridwar & Massourie)
7. Guidelines for measurement of ambient air pollutants – Part I
8. Guidelines for measurement of ambient air pollutants – Part II
9. Status of water quality in India 2011
10. Guidelines on methodologies for source emission monitoring
11. Newsletter on biofuel
12. Newsletter on adsorbable organic halides
13. शहरी कचरा – सोना उगले
14. लेखों का संकलन
15. पर्यावरण प्रबंधन में पर्यटन का योगदान

9.2 Mass Awareness Activities in Zonal Offices:

ZO - Bhopal

World Environment Day (WED) is celebrated every year on 5th June all over the world to stimulate awareness as well as to enhance public attention and action on the issues related to environment. On this occasion a series of awareness programmes Zonal Office, Bhopal organised from 01 June to 23 June, 2013. Zonal Office, Bhopal started one month programme on WED-2013 which envisaged plantation, mass awareness regarding ill effect of plastic, talk shows, free vehicle monitoring camp and environmental quiz for the school children for increasing awareness on environmental protection. All the WED programme were based on the theme "Think, Eat and Save" given by UNEP.

Other Mass Awareness activities

- Awareness programmes including science exhibition, demonstration of monitoring instruments and quiz competition were organized by M.P. Council of Science and Technology for dissemination of information on various environmental issues.
- To educate school childrens on ill effects of fire crackers an awareness cum demo programme were organized at Kamla Nehru School and Model School T.T. Nagar.

- To increase awareness level and to educate common man about water pollution and the harmful effects caused by idol immersion on the water quality, the Bhopal Zonal Office jointly organized workshop with MPPCB. Lectures were delivered at Bhopal, Gwalior and Ganj Basoda on the above issue.
- To make aware and educate, local urban bodies, professors, students and local public, Zonal Office Bhopal participated in various workshops organised by other organisations and the officers delivered lectures on management of Plastic waste, Biomedical waste and Municipal Solid waste.

Celebration of Hindi Saptah :

The jurisdiction of Zonal Office, Bhopal covers states of Madhya Pradesh, Chhattisgarh and Rajasthan which are under "Ka" Kshetra. In compliance of the Rajbhasha Rules most of the correspondence and file work is being done in Hindi. Zonal Office, Bhopal is notified under Rule 10(4) of Rajbhasha Act 1976. Sincere efforts are being made for continuous implementation of Rajbhasha Rules in office. As per the Rajbhasha rules quarterly meeting and workshop were organised in association with local office of Department of Official Language. Several events and competition were organised during 13 to 20 September, 2013 in celebration of Hindi Saptah. Details of such programmes are given below:

Date	Activity
13.09.2013	Shrutilekh competition.
16.09.2013	Rajbhasha rules competition & Unicode Hindi typing competition.
20.09.2013	Cultural programme and prize distribution.

Interaction Meet on "Municipal Solid Waste Management"

In compliance of Hon'ble NGT order dated 04.02.2014 an interaction meet on "**Municipal Solid Waste Management**" was organized by Central Pollution Control Board, Zonal Office, Bhopal on 10th March 2014, along with the

representatives of State Pollution Control Boards (SPCBs) & senior officers of Urban Administration Development Departments (UADDs) of states of Madhya Pradesh, Rajasthan and Chhattisgarh. Interaction meet was attended by officials of SPCBs,

UADD & NGOs. The objective of interaction meet was to discuss the various issues and practical problems being faced by ULBs in management of MSW and also to invite suggestions for effective implementation of rules and improvement in existing practices of MSW management.

During interaction meet representatives of State pollution Control Boards and Urban Local bodies discussed about the factors responsible for non- compliance of provisions of MSW rules and also placed their suggestions for effective management of MSW. The outcome of the meeting comprises suggestions pertaining to technical capacity building of ULBs, requirement of infrastructure development and institutional arrangements etc. The minutes have been circulated to all concerning departments for necessary action.

ZO - Lucknow

World Environment Day, 2013 was celebrated in CPCB's Zonal Office, Lucknow. The activities included 1) Plantation, 2) Interaction among staff members to create awareness, and 3) Display of educative Banner. Hindi week was organised during 13.09.2013 to 19.09.2013, during which competitions on essay writing, poem writing etc. were conducted among staff.

Hindi Workshop on office procedure was organized at Zonal Office, Lucknow on 20.12.2013 and attended by the officials of CPCB, UPPCB, Survey of India and Bureau of Indian Standard.


World Environmental Day Celebration


Eco-Ganesha festival Celebration


Awareness programme for post graduate students


Hindi Diwas Celebration


Eco-friendly Deepawali Celebration

ZO - Bengaluru

- Organized mass awareness programme in High School, Colleges and Public places including evaluation of Environmental Awareness among students community. World Environment Day was observed on June 5, 2013 at Zonal Office, Bengaluru to promote awareness on the importance of Sustainable Consumption. "Think, Eat, Save, and Reduce Your Footprint" was the theme of WED, 2013 which was emphasized throughout the programme.
- An awareness campaign was initiated to promote the use of clay Ganesha idols during celebration of Ganesha festival to maintain ecological sustainment. Clay Ganesha idol was distributed in several educational institutions on September 6, 2013. Smt.H.D. Varalakshmi and Smt. Mahima.T slaired their experence with teaching faculty and students on the environmental impacts of immersion of Ganesha Idols after Ganesh Chaturthi and on measures to resolve the same. Teaching faculty and students pledged to follow the same.
- To promote the use of Rajbhasha Hindi at CPCB Zonal Office, Bengaluru, Hindi Diwas was celebrated on October 31, 2013. During the occasion,Hindi noting and drafting, debate and poetry recitation competitions were conducted.

Quarterly progress reports on status of implementation of Hindi are regularly sent to department of official language, Bengaluru and Town official language implementation Committee, Bengaluru. A new Hindi word is written everyday on the notice board to familiarise officials about Hindi language.

- Around 80 Post- Graduate Students and ten teaching faculty from Palakkad, Kerala visited ZO Bengaluru to have a glimpse of the activities of CPCB and its role in abatement and control of polution in state of Kerala.
- The staff were encouraged to celebrate eco-friendly Deepavali festival without bursting of crackers. As a traditional practice during festival, drawing rangolis was also taken up to promote the theme.

Participants in the workshop

ZO - Kolkata

The CPCB enlisted NGO, Prantik Jana Vikash Samity, West Bengal conducted one day "Awareness program on 'Environmental Crises : Consequences & Impacts for Third World' on 30th November, 2013. The programme was sponsored by CPCB. The NGO submitted a comprehensive report on the proceedings and attendees to the said program. The programme was held at the Bidhannagar Government College. The workshop was attended by about 78 persons and the deliberations made were in line with the set objectives of the proposed workshop. The speakers were known environmentalists having vast knowledge and experience in their respective field.

- ZO Kolkata had arranged a meeting at West Bengal Pollution Control Board to discuss `Status of Compliance and Environmental issues related to Sponge Iron Plants' on 05th April, 2013. Member Secretary CPCB and other officials from SPCBs/PCCs of the region and representatives from big sponge iron plants attended the meeting.

- One NGRBA meeting was organized by Zonal Office, Kolkata on 20th December, 2013. Concerned officers from Bihar, Jharkhand and West Bengal State Pollution Control Boards and CPCB, Head Office, Delhi attended the meeting.
- A Brain Storming Session on `Quality and Authenticity of Environmental Data' for MoEF along with Second Steering Committee meeting of Experts on GAINS Model was organised on 14th March, 2014 at Kolkata. The programme was attended by senior officials of MoEF, NEERI, TIFAC, CPCB and West Bengal Pollution Control Board.
- A 2-Day Training programme on `Source Monitoring' for harmonization of monitoring protocol was orgnised during 27-28th March, 2014. The programme was attended by 45 officials from CPCB ZO Kolkata, Orissa SPCB, West Bengal State Pollution Control Board and Jharkhand State Pollution Control Board.

Training Programme for School Teachers on Environmental Aspects

One-day training programme on environmental issues for school teachers was organized on February 01, 2014. The training programme was attended by 24 teachers from various schools. The interactive session covered presentations, video, demonstration besides distribution of reference material prepared in-house by Zonal Office.

Awareness among Students about Environmental Laboratory

A visit to Zonal Office Laboratory was arranged in the month of April, 2013 for students of Bright Day School and Nalanda International School as part of environmental awareness programme.

World Environment Day Celebration

- West Zone Office celebrated World Environment Day jointly with Maharaja Sayjirao University of Vadodara by organising seminar & discussions. The programme was attended by experts, students and environmental activists.

Awareness programme for school students in Zonal Office

project office Agra

- World Environment Day-2013 was celebrated by Agra office in Agra city on 5th June 2013 with distribution of pamphlets, stickers at various locations including Tajmahal, Etmad-ud-daulah, Rambagh, Dholpur House and other places.

Implementation of Rajbhasa Hindi:

- Progress of implementation of various actions for promotion of Rajbhasha was reviewed regularly.
- “Rajbhasa Hindi Pakhawada” was celebrated during 14th Sep. to 30th Sep. 2013 at Agra Office. Essay, Noting writing, Sambhashan Competition were organized during the Hindi Pakhawada.
- Hindi Workshop was organized in office on 8th March 2013.
- Annual Report-2013-14 of Rajbhasa Hindi has been submitted to NARAKAS, Agra and Head Office & Zonal Office Lucknow.
- 05 no. of Hindi books were purchased during the year for library.
- Regular participation in the meeting organized by NARAKAS, Agra for issues related to promotion of Rajbhasha.

- For the maximum use of Rajbhasha Hindi in office work, CPCB, Agra office has been awarded with 'VISHESH' certificate among all central Govt. offices in Agra for the year-2013-14.

Right to Information Act, 2005

- ❖ The Right to Information Act, 2005 came in force for implementation vide Gazette of India Notification No.25 dated June 21, 2005, New Delhi.
- ❖ As per clause 2(h) of the RTI Act 2005, CPCB is covered as "Public Authority".
- ❖ CPCB has appointed 34 CPIOs and 1 Appellate Authority for dealing with the requests received from Information Seekers.
- ❖ A Manual has been compiled and uploaded on the CPCB's website as per clause 4(1)(b) of the RTI Act, 2005.
- ❖ Applications received under RTI from the Public, NGOs, VIPs and VVIPs are disposed and follow up maintained on the pending matters.
- ❖ Status of the applications received under RTI during 2013-14 are as follows:

Quarter	Applications	Appeals	Transferred
Apr - June	102	3	19
July-Sept	85	7	15
Oct-Dec	104	6	19
Jan-Mar	127	4	31
TOTAL	418	20	84

Activities of NGO Cell (2013 - 2014)

An NGO Cell was set up in CPCB in the year 1992 to coordinate the following tasks:

- Enlist environmental NGOs, with CPCB, involved in activities related to pollution control.;
- Establish NGO network in consultation with State Pollution Control Boards/ Zonal Offices;
- Provide training to the NGOs and equip them with facilities, like water testing kits, analytical instruments, books, literature etc. in order to enhance their capabilities in the field of pollution control; and
- Organise mass awareness programmes and pollution control activities through NGOs.

During 2013-2014, additional 11 NGOs were enlisted with CPCB subject to concurrence of concerned CPCB Zonal Offices apart from 756NGOs already enlisted during the previous years. A rebate @ 50% is extended for the purchase of CPCB publications, to NGOs enlisted with CPCB and several NGOs have availed this facility during 2013-2014.

Financial Assistance of Rs. 10,000/- each was provided to 5 NGO's for organizing Mass Awareness Programme on abatement of pollution during the year 2013 - 2014.

CHAPTER X

ENVIRONMENTAL STANDARDS INCLUDING SCHEDULE FOR THEIR ENFORCEMENT

Clean Technology and Development of Environmental Standards for Limestone Mining

A study has been undertaken on “Description of clean technology and development of environmental standards for limestone mining” in association with Central Institute of Mining & Fuel Research, Dhanbad. The main objective of this study is to develop the National Environmental Standards, suggest cleaner technologies and to specify Guidelines/Code of Practice for Pollution Prevention & Control. The study has been completed and Final report is submitted.

Major recommendations of the study are as follows.

1. Drilling operation need to be conducted as per the recommendations of the manufacturer using sharp drill bits, applying sufficient thrust on the drill bit etc. Dust generated during drilling operation need to be controlled at source by providing suitably designed dust extractor for dry drilling (where there is a scarcity of water), otherwise wet drilling should be practiced.
2. Scientific blast design using non-electric initiation systems and use of electronic detonators should be encouraged. Secondary blasting to blast boulders can be avoided by using hydraulic rock breakers so that noise and dust generation can be avoided.
3. Surface continuous miner and ripping/dozing machines where ever feasible shall be used, replacing drilling and blasting to reduce noise levels and dust emissions.
4. In order to ensure optimum utilization of mining equipment, selection of equipment should be based on low cost and high productivity considering the future production targets.
5. As haul road is potential source of fugitive dust emission dust consolidation on mine haul roads shall be done by spraying water along with chemical binders/ wetting agents through water sprinklers at frequent interval in order to reduce water consumption and to improve retention and re-absorption capacity of water. In case of trucks plying on the public roads, the trucks shall be properly covered, leak proof and ply at safe speed.
6. Scientific study of working in higher bench heights, higher overall slope angles considering geo-mining parameters is recommended.
7. Simultaneous back filling operations with the waste material generated should be encouraged.

8. Adequate dust suppression and/or dust extraction facilities need be provided at crushing plant and cement plant.
9. Waste dumps shall be properly dressed, benched, sloped at low angle with terracing and bamboo barricades in the slopes, making retaining walls/stone barriers at the toe of the dumps, gully plugging etc. to prevent the soil erosion during monsoon, besides establishing vegetation on dump top as well as its slope surface. In difficult cases, hydro seedling technique or use of geo-textiles mat embedded with seeds shall be adopted.
10. Proper mine closures plans needs to be implemented by the mine authorities. It should be made mandatory for mine owners to furnish financial and performance bonds for ensuring proper mine closure with rehabilitation of the site.
11. At the final stage of an open cast limestone mine, a water body of say, less than 30 meter depth to should be created which would be a community asset in providing irrigation water and recharge of ground water in the region, besides water harvesting practices.

The draft standards has been proposed after discussion with the industry representatives, industry associations, State Pollution Control Boards and other statutory bodies associated with the limestone mining. The proposed standards are put up for consideration of the Peer & Core Committee.

Development of Noise Standard for off-road vehicles and construction equipments

CPCB has initiated awarded a project in association with to Automotive Research Association of India (ARAI), Pune to develop noise standard for 8 nos. off road vehicle and construction equipments (tracked dozers, tracked loaders, tracked excavator-loaders, wheeled dozers. wheeled loaders, wheeled excavator – loaders, combustion engine driven counter balanced lift trucks and mobile cranes). The study has been completed As per findings, most of the suppliers are of foreign origin. The equipments supplied abroad are complying with European Commission (EC) norms. But most of the equipment supplied by India ar not meeting the EC norms. The standard will be proposed once the study data is compiled.

Revision of emission norms for DGset and Genset driven by Petrol & Kerosene

Emission norms for Petrol driven Generator sets have been revised vide GSR 335(E), dated 7th August 2013. The revised emission norms are stringent compared to previous norms.

Emission norms for Genset Diesel engines have been revised vide GSR 771 (E) dated 11th December 2013. Major changes in these norms are :

- BIS certification requirement for under 19 kW engines has been omitted in the norms as the existing norms are for naturally aspirated engines.
- The testing shall be done as per D2 – 5 mode cycle of ISO: 8178- Part 4. Smoke shall not exceed prescribed value throughout the operating load points of the test cycle. It is believed to be very stringent.

Development of Noise and Emission standard for LPG and CNG driven Gensets

Noise and emission norms for LPG and CNG driven Gensets have been finalised and are under notification at MoEF. These norms are introductory standards. These are at par with revised emission norms of Petrol and diesel driven Generator sets. These may be reviewed after availability of three years of COP data.

Guidelines for loading, unloading and transportation of flyash and bottom ash generated by thermal power stations

As per the conventional practices, ash is disposed in slurry form to the ash ponds and the overflow from the ash pond after adequate settling is discharged in nearby water bodies. This mode of ash disposal not only causes air and water pollution but also requires large land area. The Hon'ble Supreme Court of India in its Order dated August 13, 2013 and September 24, 2013, in the matter of **Damodar Valley Corporation &Ors Vs BKB Transport (P) Ltd.& Company, SLA No. 30381of 2011**, directed CPCB to frame guidelines for loading, unloading, utilization and nuisance free transportation of all types of flyash, including flyash, bottom ash etc. generated by thermal power stations at the earliest. Accordingly guidelines were prepared to:

- Maximise dry collection of fly ash and bottom ash:
- Prevent fugitive emission during loading, unloading, storage & transportation (including code of practices for general maintenance of roads, vehicles and conditioning of flyash).

Effluent and Emission standards for Dyes and Dye Intermediate

The Environmental Standards for Dye and Dye Intermediate Industries got approved by the expert committee of MoEF for notification under the Environment (Protection) Act, 1986. These standards are under process of notification.

Table 10.1: Effluent standards (maximum allowable values in mg/l except for pH and Colour)

Sl. No.	Parameter	River discharge	Marine Discharge	Discharge on Land for irrigation
1	pH	6 to 8.5	5.5 – 9.0	5.5 – 9.0
2	Colour	400		
3	TSS	100	-	200
4	Oil & Grease	10.0	20.0	10.0

5	Phenolic compounds as $C_6H_5O_4$	1.0	5.0	...
6	Ammonical nitrogen as N	50	50	...
7	BOD	30	100	100
8	COD	250	250	...
9	Cr+6	0.1	1.0	...
10	Total Cr	2.0	2.0	...
11	Hg	0.01	0.01	...
12	Cu	2.0	3.0	...
13	Zn	5.0	15.0	...
14	Ni	3.0	5.0	...
15	Cd	0.2	2.0	...
16	Pb	0.1	2.0	...
17	Mn	2.0	2.0	...
18	Cl	1000	....	....
19	Sulphate	1000	.....	.....
20	Bio-assay	90% survival in 96 h	90% survival in 96 h	90% survival in 96 h
21	Temperature	Shall not exceed 5^0C above the receiving water temperature	Shall not exceed 5^0C above the receiving water temperature	...

Table 10.2: Emission Standards (From Process Vent)

Sl. No.	Gas	Standards mg/Nm^3
1	SOx	200
2	HCl	35
3	NH_3	30
4	Cl_2	15

Standards for Fertiliser Industry

The standards approved by Peer and Core Committee were discussed in the 164th board meeting held on January 21, 2014. The new standards aim at harmonization of earlier standards. The standards got approved by the Board and forwarded to MoEF for discussions in expert committee meeting and are as follows:

Effluent:

Sl. No.	Parameter	Standard Not to exceed
1.	Wastewater Generation Naphtha, Natural Gas & Mixed Feedstock (Naphtha+Natural Gas) Based	4.0 m^3/MT of Urea

Sl. No.	Parameter	Standard not to exceed (in mg/l except pH)
Straight Nitrogenous Fertilizer Plant/Complex Fertilizer plants and/or NP/NPK		
1.	pH	6.5-8.5
2.	Ammonical nitrogen as N	50.0
3.	Free Ammonia as N	4.0
4.	Nitrate nitrogen as N	10.0[1]
5.	Total Kjeldhal nitrogen (TKN) as N	75
6.	Dissolved Phosphate as P	5.0[2]
7.	Fluoride as F	10[2]
8.	Suspended solids	100
9.	Oil & grease	10

Notes:

1. *The limit of nitrate nitrogen (NO_3-N) would be 20 mg/l for those nitrogenous fertilizer plants, which are manufacturing Calcium Ammonium Nitrate (CAN), Ammonium Nitrate and complex fertilizer plants manufacturing ANP.*
2. *Applicable only for complex Fertilizer Plants.*

Sl. No.	Parameter	Standard not to exceed (in mg/l except pH)	International standards
Straight Phosphatic Fertilizer Plant			NA
1.	pH	6.5-8.5	NA
2.	Dissolved Phosphate as P	5.0	NA
3.	Fluoride as F	10	NA
4.	Suspended solids	100.0	NA
5.	Oil & grease	10.0	NA

Emission:

Sl. No.	Parameter	standard not to exceed mg/ NM^3		International standards		
				EU		WHO
				New	Ext.	
1.1	**Straight Nitrogenous**					
Ammonia Plant: - Reformer						
1.	Oxides of Nitrogen (as NO_2)	400 at 3% O_2		150	300	300
Urea Plant – Prilling Tower						
1.	Particulate Matter (PM)	150 (pre 1982 units)	50 (post 1982 units)	50	100-150	50

1.2	**Nitric Acid plant**					
1.	Oxides of Nitrogen as NO_2	400		300	800	300
1.3	**Phosphatic Fertilizer Plants – Phosphoric Acid Plants/ Rock grinding & acidulation SSP plants**					
1.	Particulate Matter (PM)	125		50	150	50
2.	Total Fluoride as F	20	30 (Phosphoric acid plant) 5 (SSP)	5		5
1.4	**Sulphuric Acid Plant: Emission Standards for Sulphuric acid plants as notified vide G.S.R. 344(E) dated May 07, 2008 shall be applicable.**					
1.5	**Ammonium Nitrate / Calcium Ammonium Nitrate/ NPK plant**					
1.	Particulate Matter (PM)	150		50		50
2.	Ammonia as NH_3 [1]	300 (existing)	150 (new/ expansion)	50		50
3.	Total Fluoride as F [2]	20				

1. *Grace time for 1 years period may be given to units to meet the norms.*
2. *Fluoride applicable only for NPK plant*

Preparation of Comprehensive Industry Document, Development of Emission and Effluent Standards for Single Super Phosphate Plants:

In-house project initiated for Development of Emission and Effluent Standards for Single Super Phosphate Plants. Data is being collected through questionaire and dry visits. Compilation of data, as received is in process.

Preparation of Comprehensive Industry Document (COIND) on Paint Industry

Paints constitute a mixture solvents, binders, pigments and additives. The raw materials used in the manufacturing of paint are organic chemicals, solvents, heavy metal based pigments or complex resins which results in air emissions (VOC & dust), wastewater and solid waste/sludge (containing heavy metals & toxic organic chemicals). COIND on Paint Industry was prepared in 1990-1991 for development of effluent standards. Since then sector has undergone fundamental changes in terms of raw materials consumption, technological up-gradation, and demand growth potential, with an average rate of 13% over the last five years. There was a need to revise the existing effluent standards and to develop emission standards. This study was undertaken in association with NPC, New Delhi in April 2009. The study duration was 3 years. The study has been completed.

The proposed standards were put up in the peer & core meeting held on March 4, 2014. Effluent standards, Standards for VOCs & air emission were proposed which are given below:

(1) Effluent Standards:

A. For water based paint industry:

The entire vessel wash water shall be recycled back in the process only.

B. For resin & solvent based paint industry:

The industry shall incinerate the effluent in the incinerator and emission limit of Common Hazardous Waste Incinerator notified under GSR - 481(E) dated June 26,2008 under the Environment (Protection) Rules, 1986 shall be applicable.

OR

In case the effluent is discharged, it shall meet the following norms:

Parameter in and Solvent based unit	Standards (in mg/l except pH & Bioassay)
pH	6.0-8.5
TSS	100
BOD 3 days at 27°C	30
Phenolics as C_6H_5OH	1.0
Oil and Grease	10
Bio-Assay Test	90% survival in 100% effluent in 96 hrs
Optional Parameters	
Lead as Pb	0.1
Total Chromium	2.0
Copper as Cu	2.0
Nickel as Ni	2.0
Zinc as Zn	5.0
Total Heavy metals	<7.0
Arsenic as As	0.2
Cobalt as Co	0.2

(2) Standard for air emissions:

(i) For Particulate Matter:

Limiting Concentration for Particulate Matter emission shall be 50 mg/ Nm^3 for all process vents attached to pre-mixers and mixers. The emissions shall be routed through common vent.

(ii) For Volatile Organic Compounds (VOCs):

Solvent Consumption (tons/annum)	Total Emission Limit (% of solvent consumed)
Less than 1,000	5
More than 1,000	3

The following guidelines shall be adopted to reduce the solvent emissions.

- Covering of all open top vessels and tanks used to mix resin & solvent to disperse pigment & extender pigment.
- Adopting submerged filling for transferring VOC containing materials.

For Solvent based paint industry the efficiency of system controlling emission of Volatile Organic Compounds shall not be less than 85%.

Preparation of Comprehensive Industry Document and the Status of Pesticide Industry

Comprehensive Industrial Document (COIND) for Pesticide Industry was prepared in 1985-86 and revised during 1988-89. Further, status of pesticide Industry was prepared in the year 1993-94. In these documents, aspects of air pollution and solid waste were not covered. Later, source emission standards for inorganic parameters like HCl, Cl_2, H_2S, P_2O_5, NH_3, HBr & PM and CH_3Cl (organic) were notified during year 2006 and also incinerator emission standards were notified in 2008 for pesticide industry. Since then the sector has undergone changes in terms of raw material consumption, technological up-gradation, demand growth potential, and diverse product range. There is a need to re-look into the additional pollutants generated from pesticide industries other than the notified parameters and develop VOC emission standards. The existing document therefore needs to be upgraded to include new and developing technologies and their efficacy to treat various pollutants, also to include status of pesticide industries.

Therefore, a project on "Preparation of Comprehensive Industrial Document (COINDS) on Pesticide industry" has been awarded to M/s Development Consultants Ltd. (DCL), Kolkata in November, 2013. The duration of the study is 2 years. Study of the units is in process.

Environmental Standard of Manmade Fiber Industry

Revision of emission standards for carbon disulphide (CS_2) and hydrogen sulphide (H_2S) is solicited by Association of Manmade Fibre Industry for new and expansion projects due to non-availability of desirable cost effective technologies to meet the existing emission norms for CS_2 and H_2S. This studay addresses the revision and up gradation of the existing Comprehensive Industry Document (COIND), first prepared in 1979-80 for liquid effluents in Manmade Fibre Industry. The objectives of study also include to review existing effluent standards for Rayon and Nylon Industry. The study has been completed and proposed standards were put up in the Peer & Core meeting held on March 4, 2014.

(A) Effluent Standards

Parameter	Synthetic and Semi synthetic
pH	6.0-8.5
Suspended solids	100 mg/l
BOD 27^{0}C 3 days	30 mg/l
Zinc	1.0 mg/l
% Na (Viscose Staple fibre and Viscose Filament Yarn units)	60

Note: *Limits for Total dissolved solids in effluent shall be prescribed by the concerned Pollution Control Board/Pollution Control Committee depending upon the recipient water body*

(B) Wastewater Generation

Industry	Wastewater generation (m3/ton of fiber/yarn)
Viscose Filament Yarn	150
Viscose Staple Fibre	75
Nylon, Polyester and Acrylic	10

(C) Source Emission

Pollutant	**VSF Plants** Proposed Emission Standard (kg/MT of VSF)
CS_2	95
H_2S	30
	VFY Plants Proposed Emission Standard (kg/MT of VFY)
CS_2	200
H_2S	20
	(Rayon, Polyester and Nylon fabric dipping Plants)
NH_3	0.3 kg NH_3/MT of dipped fabric
	Acrylic Fiber Plants
Total VOC including Dimethyl formamide and Acrylonitrile	50 mg/Nm^3

(D) Fugitive emission (Viscose Staple fibre and Viscose filament yarn plants)

CS_2 -10 ppm

H_2S-10 ppm

(E) Existing standard for CS_2 and H_2S in ambient air shall prevail.

Development of Emission Standards & Preparation of Comprehensive Document (COINDS) for Pharmaceutical sector

COIND for Pharmaceutical sector was first prepared covering liquid effluents in the year 1988-89. Some efforts were made to prepare a report to deal with emission aspects of this industry sector initially through NEERI in the year 1995 and later by an individual expert but the studies remained incomplete. Since then the sector has undergone changes in terms of raw material consumption, technological up-gradation, demand growth potential, and diverse product range. Also there is a need to relook into the critical pollutants generated from pharmaceutical industries other than the conventional pollutants. The existing document therefore needs to be upgraded to include new and developing technologies and their efficacy to treat various pollutants, also to include status of Pharmaceutical industries.

The revision of COIND is required to include the status of pharmaceutical industries with production details of different types of bulk drugs with therapeutic use, number of units and their locations, type of pharmaceuticals and process adopted, raw materials used and effluent generation from different streams, segregation & its treatment presently adopted by industrial units, mode of disposal of wastewater, reduction & recycling of effluent, Best treatment technologies available, by- product recovery / utilization, solvent recovery, type and source of emissions from processes, BAT for control of emission, Cost of Treatment both for waste water as well as emission etc.

Therefore, the project on "Development of Emission Standards & Preparation of Comprehensive Document (COIND)" has been undertaken in association with to M/s Ramky Pvt. Ltd., New Delhi in October, 2013. The duration of the project is 2 years. Dry study of the units is in process.

Development of Comprehensive Industry Document (COINDS) for Automobile Manufacturing Industries

This study has been undertaken in association with to TERI. The objectives of this study includes Inventorisation of automobile manufacturing industries, process details of automobile manufacturing industry covering all categories of vehicles, identification of different sources of pollution for the automobile manufacturing industry, characterization of liquid effluent, gaseous emissions and hazardous wastes storage and disposal methods, resource recycling and waste minimization practice, identification of technologies appropriate for the control of water pollution, air pollution and fugitive emissions under Indian conditions and development of environmental standards for the automobile industry. The draft final report is under finalisation.

Inventorization of Railway sidings and Guidelines for their Environmental Management.

The study on Inventorization of Railway sidings and development of guidelines for their environmental management has been taken up by CPCB subsequent to a large number of public complaints related to railway sidings. This study has been awarded to RITES Limited, Gurgaon. The Objectives of the study involves Inventory of all major railway siding (Railway yards, ports, mines etc.), and development of guidelines for Environmental Management of Railway sidings. The draft final report is under finalisation.

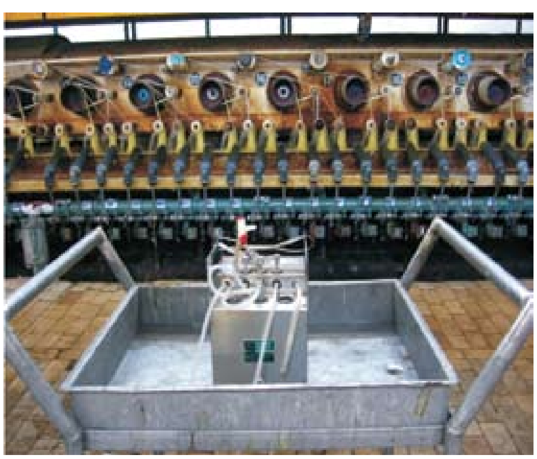
Revision of COINDS on Tanneries

The Comprehensive Industry Document (COIND) on tanneries was brought out by CPCB in 1991-92 and effluent standards for tanneries at S. No. 16 and 57 in Schedule I of the E (P) Rules 1986 were notified on 18.1.1988 and 5.5.1992, respectively.

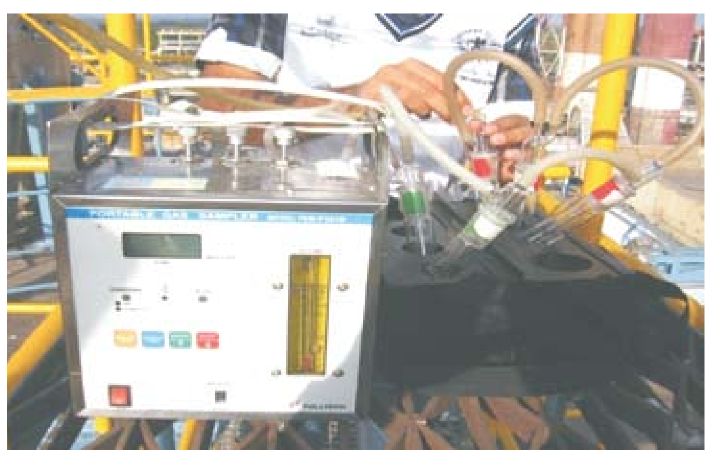
The leather tanneries' standard had become old hence it was necessary to review the standards. CPCB entrusted the study for revision of Comprehensive Industry Document (COIND) on tanneries and revision of standards for tanneries to Central Leather Research Institute (CLRI). The study covered following tasks:

- Enumeration of tanneries in India - Tannery clusters in Punjab, UP, TN and WB were visited by CLRI Scientists and data regarding processing capacity, type of process were collected.
- State-wise distribution of tanneries and over all classification of tanneries in India based on type of process and processing capacities were collected.
- In-depth analysis of sectional streams, characteristics of composite wastewater and, pollution load generated from processing Raw to Wet blue, Wet blue to Finish, EI to Finish.
- Performance evaluation of pretreatment systems in individual tanneries and CETPs were carried out by collecting wastewater samples from individual tanneries connected to CETPs.
- Studying the following aspects – point of discharge, present disposals standards, latest treatment technologies available for treatment of effluent, and present pretreatment methods adopted in individual tanneries connected to CETPs.

CLRI's proposal for revision of environmental standards for tanneries based on above study was placed in the 28th Meeting of the Peer & Core Committee of the Central Board held on March 4, 2014. However, in view of no significant difference in the proposed effluent standards for tanneries from the existing standards it has been considered to instead develop a charter for abatement and control of pollution from tannery sector which will incorporate various environmental issues related to tanneries.



CS_2 and H_2S Monitoring in spinning Mill



CS_2 and H_2S Monitoring

Revision of Emission Standards and COINDS for Brick Kilns

The Comprehensive Industry Document (COIND) on brick kilns was brought out by CPCB in 1996 and emission standards for Bull's trench brick kilns at S. No. 74 in Schedule I of the E (P) Rules 1986 were notified on 2.4.1996. The Bulls' trench brick kilns standard had become old hence it was necessary to review the standards. CPCB entrusted the study for revision of emission standards for brick kilns revision of Comprehensive Industry Document (COIND) on brick kilns to Punjab State Council for Science & Technology (PSCST). The study covered following tasks:

- Review of relevant National/ International experience.
- Preparation of inventory in brick kilns.
- In depth study of 50 brick kilns including emission monitoring of brick kilns.
- Development of emission standards and stack height regulation for brick kilns.
- Development of guidelines for siting, better working and housekeeping.

The above study was completed during the year and the emission standards and guidelines for brick kilns suggested by PSCST were presented before the stakeholders and experts in a Consultation Workshop held on 13th August 2013. The comments received were considered and a proposal for revision of environmental standards for Bulls Trench kilns and Hoffmann kilns was prepared and placed in the 28th Meeting of the Peer & Core Committee of the Central Board held on March 4, 2014, which has been approved by the Committee.

Revision of Effluent Standards for Common Effluent Treatment Plants

The effluent standards for common effluent treatment plants (CETPs) at S. No. 55 A (primary) & B (final) in Schedule I of the E (P) Rules 1986 were notified on 27.2.1991. The CETP standard had become old hence it was necessary to review the standards. Central Pollution Control Board (CPCB) undertook the revision of the existing effluent standards for CETPs.

A draft proposal for CETP effluent standards was prepared by CPCB and circulated to stakeholders for consultation. The comments received were considered and a modified proposal for revision of effluent standards for CETPs was prepared and placed in the 28th Meeting of the Peer & Core Committee of the Central Board held on March 4, 2014, which has been approved by the Committee.

Development of Environmental Guidelines Improved Design and for Clamp Kilns

There were no environmental guidelines available to regulate clamp kiln hence it was necessary to develop environmental guidelines for clamp kilns. CPCB entrusted a study for evaluation and improvement of clamp brick kilns design to The Energy and Research Institute (TERI). The study covered following tasks:

- Preparation of inventory of clamp brick kilns in the country.
- Monitoring of stack/fugitive emissions and ambient air of select clamps brick kilns.
- Development of cost-effective modification in existing design & firing practices and its demonstration.
- Prepare specimen standard drawings for various production ranges/types for clamps and detailed specifications for recommended design/type of clamps.
- Development of emission standards for different type of clamp kilns and recommended emission factor.
- Development of pollution abatement options and guidelines for siting criteria, good practices & better housekeeping.

The above study was completed and the environmental guidelines and improved design for clamp kilns suggested by TERI were presented before the stakeholders and experts in a Consultation Workshop held on 13th August 2013. The comments received were considered and a proposal for environmental guidelines and improved design for clamp kilns was prepared and placed in the 28th Meeting of the Peer & Core Committee of the Central Board held on March 4, 2014, which has been approved by the Committee.

Comprehensive Industry Document (COIND) for Plywood Industries

Plywood is made from thin sheets of wood veneer, called plies or veneers. The plies are bonded under heat and pressure with strong adhesives, usually phenol formaldehyde resin, making plywood a type of composite material.

Log Conditioning

The primary emissions from the manufacture of plywood include particulate matter (PM) and PM_{10} (PM less than 10 micrometers) from log debarking, plywood trimming, sanding and from heating systems. Organic compounds including formaldehyde and other hazardous air pollutants (HAPs), from gluing and hot pressing are also produced. Fuel combustion for heating system generates carbon monoxide (CO), carbon dioxide (CO_2), sulfur dioxide (SO_2), and nitrogen oxide (NOx) emissions. The hot pressing operation is a source of significant VOCs emissions. The quantity and composition of emissions from this operation are expected to vary with wood species and resin components. In boilers coal or waste wood is normally used as fuel which emits PM and other gaseous emissions.

Glue Spreading

Hot Pressing

Keeping in view of pollution potential, Central Pollution Control Board (CPCB), undertook a study for Development of Comprehensive Industry Document (COINDS) and Environmental standards for Plywood Industry.

The project had been completed earlier and the findings of the study were deliberated in the 28th Peer & Core Committee to finalize the Environmental standards/ guidelines. It was decided that boiler standards notified in schedule-I, shall apply to the boilers used in plywood industry also, however, the minimum stack height of 30 m shall be provided by all categories of boilers in plywood units. With regard to effluent standards it was decided that general standards notified under Schedule VI, Part A in respect of parameters pH, Suspended Solids, COD, Phenol for inland surface water shall apply to the plywood units also.

Development of Environmental Guidelines for Poultry Farms:

Poultry farming is the raising of domesticated birds such as chickens, turkeys, ducks, and geese, for the purpose of farming meat or eggs for food. India is the fourth largest egg producer in the world next to China, USA and Japan.

Cage Layer House

Environmentally Controlled Broiler grower house

The leading states in poultry population in the country are Andhra Pradesh, Tamil Nadu, Karnataka , West Bengal, Maharashtra and Haryana. Poultry farming in India over the last four-and-half decades has witnessed a spectacular growth. Large farms are concentrated in urban and semi-urban localities because of easy access to inputs, expertise, communications and market availability.

The poultry production cycle consist of breeding, hatching, production of egg/meat and disposal of spent hens/broilers after each cycle of production and includes operations like poultry housing, feeding, watering and health care.

The incident of residential areas close to the farm boundaries has resulted in complaints about odour, flies, dust and noise from poultry farms. The environmental issues in poultry production primarily include odour, management of solid wastes (manure, dead birds, egg shells etc.), waste water, air emissions and pathogen contamination. Concentrating large number of birds at one place also results in large volumes of poultry manure in small areas.

Keeping in view the pollution potential from Poultry Farms, the Central Pollution Control Board undertook a study in association with the Environment Protection Training Institute (EPTRI), Hyderabad for developing Environmental Guidelines for Poultry Farms.

The findings of the study were deliberated in the 27th Peer & Core Committee to finalize the Environmental Guidelines for Poultry Farms. Peer & Core Committee recommended to obtain comments/views from the Association/stakeholders. Minutes of the peer & core committee were circulated to the stakeholders/Associations, comments/views received were considered and Guidelines were finalized. Siting Criteria for New Poultry Farms are as follows:

The Poultry farm should not be located within:
500 m from residential zone
200 m from major water course like River, Lake and Canals
500 m from any major drinking water reservoir on catchment side
100 m from any drinking water source like wells, summer storage tanks, other tanks
500 m from nearby poultry, dairy or another livestock enterprises or industry
150-200 m from National Highway (NH) 100 m from State Highway (SH) 10-15 m from rural roads/internal roads/village pagdandis
The poultry sheds should not be located within
10 m from farm boundary

The above siting criteria/Guidelines for poultry farms have been confirmed in the 28th meeting of the Peer & Core Committee.

Development of Comprehensive Industry Document (COIND) and Environmental Standards for Steel Re-Rolling Mills Of India

There are around 2100 registered re-rolling mills in India; out of which approximately 1200 Re-rolling Mills are presently working. Major clusters of this category of Units in India are in Punjab, West Bengal, Gujarat, Maharashtra, Madhya Pradesh and Rajasthan.

The Re-rolling mills, in general, are seen operating without Scientific design of Furnaces and Burners, Irregular Feeding, Improper Firing and Worst Operating Practices leading to an impact on the surrounding environment. Besides general problems of polluted air emission from stack and effluent/ waste water discharges to the nearby Nallas/ Drains, fugitive emission from the Units are a major point of concern.

Generally, in the Re-rolling Mill, only three types of solid wastes are generated: mill scale, coal ash, and coal tar.

To develop energy efficient and environmentally friendly technologies in the re-rolling mills of India, MECON was entrusted to develop the Guidelines and Standards.

MECON had done the in depth study with the following objectives:

- Classification of environmental problems (cluster/isolation) of re-rolling mills located in different geographical areas;
- Recommendation of modification needed in existing design & firing practices to control of air pollution and suggesting suitable air pollution control systems including remedial measures for prevention of fugitive emissions.
- Suggestions of suitable clean technology options, if any, for re-rolling mills for better pollution control and energy conservation;
- Guidelines/Formulation of Minimal National Environmental Standards (MINAS) for effluent, emissions and noise for the re-rolling mills which is techno-economically feasible keeping in view the National Environmental Policy-2006.

After detailed study, following points have been suggested by MECON in regard to Clean Technologies for Re-Rolling Mill

- ➢ Control of air/fuel ratio in furnace
- ➢ Use of temperature controller and indicators at various zones

- Waste Heat Recovery from Furnace Flue Gases and Minimising Wall Losses
- Use of Ceramic Fibre and Ceramic Coatings in Furnace chamber
- Control of Furnace Draft and Furnace Pressure
- Zero water discharges facility and Utilization of the solid waste
- Crop Length optimization and Universal Spindles
- Anti Friction Roller Bearings
- Lubrication Technology and Slit rolling technology
- Endless Wielding Rolling.

Proposed standards are:-

Stack Particulate Matter (PM): 150 mg/Nm^3 (Coal based Units)
75 mg/Nm^3 (Furnace Oil/Gas based Units)

Work Zone Respirable Suspended Particulate Matter (RSPM) should not exceed 2000 µg/m^3 at a distance of 10 m (approx.) from the sources.

Waste water discharge should conform to

pH - Between 5.5 to 9.0

Total Suspended Solids (TSS) - 100 mg/l

Oil and Grease (O&G) - 10 mg/l

Corporate Responsibility for Environmental Protection (CREP)

The 164th Board meeting approved to re-constitute the Task Forces for each of the 17 category of highly polluting industries to regularly review the progress of implementation of pollution control measures implemented in each category of industry and suggests action to be taken.

Preparation of office order for reconstitution of task Force for all the 17 category of industries is under process.

Installation of continuous emission and effluent monitoring system

The Central Pollution Control Board (CPCB) has directed all State Regulatory bodies i.e. State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) under section 18 (1) b of the Water Act, 1974 and the Air Act, 1981 to ensure that all the highly polluting industries shall install and operate continuous effluent and emission monitoring system and shall connect SPCBs/CPCB server by March 31, 2015. The direction include that all the highly polluting 17 categories of industry and those water polluting industries identified under the Ganga basin through SPCBs to submit bank guarantee of 25 % of the cost of online monitoring systems (emission and effluent whichever applicable) for ensuring timely installation of online monitoring systems, so that industries will develop discipline and commit for self regulatory mechanism. The systems which will give high quality scientific results of effluents and emission quality continuously on real time basis and could be brought into public domain after through validation. As on date there are 120 continuous emission monitoring stations are connected to CPCB server by 70 industries.

CHAPTER XI

PROSECUTIONS LAUNCHED, CONVICTION SECURED AND DIRECTIONS GIVEN FOR CLOSURE OF POLLUTING INDUSTRIES

11.1 ENVIRONMENT SURVEILLANCE SCHEME (ESS)

Under ESS activities, highly polluting industrial units falling under 17 categories of industries are selected through especially developed software for surprise inspection / monitoring to check the compliance of consent conditions, stipulated standards, CREP, etc. ESS inspections are conducted through six Zonal Offices of CPCB located at Bangalore, Bhopal, Lucknow, Kolkata, Vadodara, Lucknow, Bhopal, Shillong and Kolkata. The database of industries from which the units are selected for inspections, consists of the region-wise industries in these six zones.

Zonewise regions selected for ESS inspections during the year 2013-14 are presented in Table 11.1

Table 11.1: Zonewise Regions For Surprise Inspections Under ESS 2013-14

Month / Year	Zonal Office					
	Bangalore	Bhopal	Lucknow	Kolkata	Shillong	Vadodara
APRIL, 2013	S-54 (T.N.)	Jodhpur (Rajasthan)	Saharanpur (U.P.)	Balasore (Orissa) Ranigunge (WB)	Agartala (Tripura)	Tarapur (Maharashtra)
MAY, 2013	S-07 (A.P)	Udaipur (Rajasthan)	Allahabad (U.P.)	Bhagalpur (Bihar) Kolkata (WB)	Umransho (Assam)	Lote Parshuram (Maharashtra) Thane (Maharashtra)
JUNE, 2013	S-10- (A.P.)	Jaipur (Rajasthan)	Gurgaon (Haryana)	Sambhalpur (WB) Ranchi (Jharkhand)	Agartala (Tripura)	Kalyan (Maharashtra) Bhavnagar (Gujarat)
JULY, 2013	S-31 (Karnataka)	Udaipur (Rajasthan)	Nawanshehar / Jalandhar (Punjab)	Nadia (W.B.) Jamshedpur (Jharkhand)	Dhaligaon (Assam)	Ankleshwar (Gujarat) Jamnagar (Gujarat)
AUG., 2013	S-33 (Kerala)	Indore (M.P.)	Dharuhera (Haryana)	Haldia (W.B.) Kalyani (W.B.)	Tizit (Nagaland)	Ankleshwar (Gujarat) Aurangabad (Maharashtra)

Month / Year	Zonal Office					
	Bangalore	Bhopal	Lucknow	Kolkata	Shillong	Vadodara
SEPT., 2013	S-39 (Pondicherry)	Jaipur (Rajasthan)	Auraiya (U.P.)	Jhargram (WB) Palamu (Jharkhand)	Damas (Meghalaya)	Jalgaon (Maharashtra) Bhavnagar (Gujarat)
OCT., 2013	S-36 (Kerala)	Raigarh (Chattisgarh)	Gorakhpur (U.P)	Haldia (WB) Burnpur (W.B.)	Bokajan (Assam)	Ahmednagar (Maharashtra) Aurangabad (Maharashtra)
NOV., 2013	S-24 (Karnataka)	Raipur (Chattisgarh)	Saharanpur (U.P.)	Bishnupur (W.B) Diamond Harbour (W.B)	Jagiroad (Assam)	Navi Mumbai (Maharashtra) Bhavnagar (Gujarat)
DEC., 2013	S-51 (Tamil Nadu)	Raipur (Chattisgarh)	Lucknow (U.P.)	Uttarpara (W.B.) Durgapur 1 (WB)	Numaligarh (Assam)	Vapi (Gujarat) Ahmedabad (Gujarat)
JAN., 2014	S-08 (A.P.)	Bhopal (M.P)	Sirmaur (H.P.)	Jhargram (W.B.) Jajpur (Orissa)	Byrnihat (Meghalaya)	Nagpur (Maharashtra) Panvel (Maharashtra)

Note:

- *2 industries per region per month are inspected in 3 ZOs (Kolkata, Vadodara & Shillong) and 4 industries per region per month are inspected in 3 ZOs (Lucknow, Bhopal & Bangalore)*
- *Overall 201 industries were inspected during 2013-14.*
- *Statewise number of industries inspected during the year 2013-14 is presented in Table 11.2.*

Table 11.2: State-wise ESS Inspections During 2013-14

Sl. No.	State	No. of Inspections
1.	Andhra Pradesh	12
2.	Assam	8
3.	Bihar	1
4.	Chhattisgarh	12
5.	Gujarat	16
6.	Haryana	8
7.	Himachal Pradesh	4
8.	Jharkhand	5
9.	Karnataka	4
10.	Kerala	6
11.	Madhya Pradesh	6
12.	Maharashtra	22
13.	Meghalaya	3
14.	Nagaland	1

Sl. No.	State	No. of Inspections
15.	Orissa	7
16.	Puducherry	4
17.	Punjab	4
18.	Rajasthan	20
19.	Tamil Nadu	8
20.	Tripura	4
21.	Uttar Pradesh	21
22.	West Bengal	25
Total		**201**

The Sector wise number of industries inspected during 2013-14 is given in Table 11.3

Table 11.3: Sectorwise Number of Industries in Which ESS Inspection Were Undertaken During 2013-14

Sl. No.	Sector	No. of inspections
1.	Automobile	1
2.	Beverage	2
3.	Cement	24
4.	Chlor Alkali	2
5.	Chemical	3
6.	Coke Oven	1
7.	Copper	2
8.	Distillery	18
9.	Dry Cell Battery	1
10.	Dye & Dye Intermediates	6
11.	Fertilizer	10
12.	Heavy Engineering	2
13.	Iron & Steel	19
14.	Lead Acid Battery	1
15.	Metal Finishing	2
16.	Oil Refinery/ Oil-Gas Drilling	2
17.	Pesticide	6
18.	Petrochemicals	7
19.	Pharmaceuticals	29
20.	Pulp & Paper	19
21.	Plywood	1
22.	Sugar	18
23.	Tannery	5
24.	Textile	4
25.	Thermal Power Plants (including Captive Power Plants)	15
26.	Zinc	1
Total		**201**

Based on the inspection reports, Directions/ Advices are issued to the concerned SPCBs/PCCs or industries based on severity of violations either under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974/ Air (Prevention and Control of Pollution) Act, 1981 or under Section 5 of Environment (Protection) Act, 1986 for corrective measures.

The summary of the action taken against defaulting industries by CPCB during 2013-14 is presented in Table 1.1.4.

Table 11.4: Summary Of Action Taken Against Defaulting Industries During 2013-14

Year	No. of directions issued to the units under Section 5 of EPA			No. of directions issued to the SPCBs/PCCs for units under section 18(1)(b) of the Water/ Air Acts		
	No. of Directions for compliance	No. of directions for Closure	Total	No. of Directions for compliance	No. of directions for Closure	Total
2013-14	150	15	165	11	1	12

Note- *The above details include directions/notices issued in case of inspections carried out under NGRBA activities also.*

The State-wise details of the directions issued during 2010-11 to 2013-14 under Section 18(1)(b) and Section 5 of E(P) Act 1986, are presented in Table 11.5.

Table 11.5 : The State-wise details of the Directions issued during 2010-14

State	2010-11		2011-12		2012-13		2013-14		Total (2010-14)		
	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Sub-total
Andhra Pradesh	3	2	3	3	2	2	0	1	8	8	**16**
Arunachal Pradesh	0	0	0	0	0	0	0	0	0	0	**0**
Assam	4	2	5	0	5	0	2	1	16	3	**19**
Bihar	0	0	2	0	2	1	2	0	6	1	**7**
Chhattisgarh	12	0	4	0	5	2	4	0	25	2	**27**
DD & DNH	0	0	1	0	1	0	1	0	3	0	**3**
Gujarat	3	1	3	3	33	2	24	1	63	7	**70**
Haryana	0	1	1	1	2	0	2	0	5	2	**7**
Himachal Pradesh	0	0	2	0	2	0	1	0	5	0	**5**
Jharkhand	0	0	3	4	3	0	1	0	7	4	**11**
Karnataka	1	1	1	2	1	2	2	1	5	6	**11**
Kerala	0	1	1	1	1	1	2	0	4	3	**7**
Madhya Pradesh	4	0	4	5	2	1	0	1	10	7	**17**
Maharashtra	10	8	9	9	4	3	7	0	30	20	**50**
Meghalaya	0	0	0	0	1	0	0	0	1	0	**1**
Nagaland	0	0	0	0	0	0	1	0	1	0	**1**
Orissa	0	2	3	1	5	2	4	0	12	5	**17**
Pondicherry	0	0	0	0	1	0	1	0	2	0	**2**
Punjab	2	1	3	1	2	0	1	0	8	2	**10**
Rajasthan	2	2	3	3	3	2	0	3	8	10	**18**

State	2010-11		2011-12		2012-13		2013-14		Total (2010-14)		
	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Section 5 of E(P) Act	Section 18(1)(b)	Sub-total
Sikkim	0	0	0	0	0	0	0	0	0	0	**0**
Tamilnadu	2	4	12	8	1	6	8	1	23	19	**42**
Uttar Pradesh	27	2	30	8	146	8	85	1	288	19	**307**
Uttarakhand	4	4	3	1	19	2	14	1	40	8	**48**
West Bengal	5	2	4	4	3	0	3	0	15	6	**21**
Common Direction issued to all SPCBs / PCCS including one issued to 20 SPCBs/PCCs	0	0	0	0	0	4	0	1	0	5	**5**
Total	**79**	**33**	**97**	**54**	**244**	**38**	**165**	**12**	**585**	**137**	**722**

11.2 STATUS OF INDUSTRIES FALLING UNDER 17 CATEGORIES OF HIGHLY POLLUTING INDUSTRIES

Seventeen categories of highly polluting industries were identified by Ministry of Environment & Forests, Govt. of India and covered under the Central Action Plan. A 15-point programme, for priority action, was formulated by the Ministry of Environment and Forests (MoEF). The compliance status of the industrial units covered under the programme. The programme is regularly monitored by the Central Pollution Control Board. The status of these highly polluting industries is regularly obtained from respective State Pollution Control Boards / Pollution Control Committees and updated. The Sector-wise and the State-wise status of these industries as on 31st March, 2014 are presented in Table 11.6 & 11.7 respectively:

Table 11.6: Sector-Wise Summary Status Of 17 Categories of Highly Polluting Industries (March 31, 2014)

Sl. No	Sector	Complying	Non Complying	Closed	Total
1.	Aluminium	6	1	3	10
2.	Cement	251	51	21	323
3.	Chlor Alkali	26	2	2	30
4.	Copper	4	1	1	6
5.	Distillery	227	49	45	321
6.	Dye & DI	123	4	11	138
7.	Fertilizers	77	5	17	99
8.	Iron & Steel	144	88	17	249
9.	Oil Refinery	20	3	0	23
10.	Pesticide	77	4	13	94
11.	Petrochemical	32	5	3	40
12.	Pharmaceutical	544	52	66	662
13.	Power Plant	216	89	8	313
14.	Pulp & Paper	183	26	36	245
15.	Sugar	332	178	87	597
16.	Tannery	60	12	37	109
17.	Zinc	6	1	0	7
Total		**2328**	**571**	**367**	**3266**

Table 11.7: State-Wise Summary Status of 17 Categories of Highly Polluting Industries (March 31, 2014)

Sl. No.	State	Complying	Non Complying	Closed	Total
1.	A.P.	359	74	39	472
2.	Arunachal Pradesh	2	0	0	2
3.	Assam	36	12	1	49
4.	Bihar	16	4	0	20
5.	Chattisgarh	71	6	1	78
6.	Chandigarh	0	0	0	0
7.	Daman & Diu	1	1	1	3
8.	Delhi	2	0	0	2

Sl. No.	State	Complying	Non Complying	Closed	Total
9.	Goa	13	2	0	15
10.	Gujarat	302	7	8	317
11.	Haryana	119	6	16	141
12.	H.P.	14	0	3	17
13.	Jharkhand	103	48	22	173
14.	J& K	7	0	3	10
15.	Karnataka	175	30	26	231
16.	Kerala	21	11	19	51
17.	Lakshadeep	0	0	0	0
18.	Madhya Pradesh	65	16	2	83
19.	Maharashtra	317	145	58	520
20.	Meghalaya	4	12	1	17
21.	Mizoram	1	0	0	1
22.	Nagaland	0	0	0	0
23.	Orissa	37	17	11	65
24.	Puducherry	5	2	0	7
25.	Punjab	57	12	18	87
26.	Rajasthan	69	31	18	118
27.	Sikkim	3	1	0	4
28.	Tamil Nadu	165	19	5	189
29.	Tripura	10	1	6	17
30.	U.P.	278	36	89	403
31.	Uttarakhand	33	4	6	43
32.	West Bengal	43	74	14	131
Total		**2328**	**571**	**367**	**3266**

11.3. INDUSTRIAL POLLUTION CONTROL ALONG THE RIVERS AND LAKES

Ministry of Environment & Forests in association with Central Pollution Control Board initiated a programme to identify and inventorise polluting industries located along the rivers in the country for priority actions in the year 1993-94, for control of industrial discharges in to rivers. Subsequently, the National River Conservation Authority (NRCA) in its meeting held on July 12, 1997 under the Chairmanship of the Hon'ble Prime Minister decided that the polluting industries, which are discharging their effluents into the rivers and lakes should be directed to install the requisite effluent treatment systems within three months, failing which closure notices should be issued. Accordingly, Chairman, Central Pollution Control Board at the instance of MoEF, issued directions under Section 18(1) (b) of The Water (Prevention & Control of Pollution) Act, 1974, to all the SPCBs/PCCs on July 14, 1997, requiring them to inventorize the list of GPIs(Grossly Polluting Industries) and take necessary action against the defaulting industries. GPIs were defind as industries discharging effluents into a water course and a) handling hazardous substances, or b) effluent having BOD load of 100 Kg per day or more, or c) a combination of (a) and (b).

The programme is being regularly monitored with feedback from State Pollution Control Boards / Pollution Control Committees. Direct actions against the defaulter industries are also being taken by Central Pollution Control Board, as and when needed. The State–wise compliance status of grossly polluting industries in various States and Union Territories summarized in Table 11.8

Table 11.8 State wise Status of Grossly Polluting Industries discharging their effluents in Rivers and Lakes (As on March 31, 2014)

Sl. No.	State	Nos. of Industries	Complying	Non Complying	Closed	Information not available
1.	Andhra Pradesh	16	9	7	0	0
2.	Bihar	22	16	1	5	
3.	Assam	9	4	5	0	0
4.	Chandigarh	0	0	0	0	0
5.	Daman & Diu	3	0	0	0	3
6.	Goa	2	2	0	0	0
7.	Gujarat	3	2	1	0	0
8.	Haryana	109	98	9	2	0
9.	Himachal Pradesh	6	6	0	0	0
10.	Jharkhand	5	4	1	0	0
11.	Karnataka	10	8	0	2	0
12.	Kerala	2	2	0	0	0
13.	Madhya Pradesh	1	0	1	0	0
14.	Maharashtra	2	1	0	1	0
15.	Mizoram	0	0	0	0	0
16.	Nagaland	0	0	0	0	0
17.	Orissa	20	6	8	5	1
18.	Puducherry	0	0	0	0	0
19.	Punjab	7	4	2	0	1
20.	Sikkim	1	0	1	0	0
21.	Tamil Nadu	1	1	0	0	0
22.	Tripura	0	0	0	0	0
23.	Uttar Pradesh	594	410	65	119	0
24.	Uttarakhand	50	25	18	6	1
25.	West Bengal	31	24	2	5	0
Total		**894**	**622**	**121**	**145**	**6**

Note: *Information on status of operation of Effluent Treatment Plant in Grossly Polluting Industries not provided by eight SPCBs/PCC namely Delhi, Rajasthan, Arunachal Pradesh, Jammu & Kashmir, Meghalaya, Manipur, Lakshadweep and Andaman & Nicobar Islands.*

11.4 ABATEMENT OF POLLUTION IN 43 CRITICALLY POLLUTED AREAS

Environmental pollution due to increasing industrialization and urbanization has reached to the alarming levels. Indiscriminate disposal of different categories of wastes into the environment at many places have resulted in serious damage to the natural resources (soil, water and air), flora & fauna, and health of human beings.

The Central Pollution Control Board (CPCB) initiated a programme to identify severally polluted -areas for initiating concerted action and monitoring at the national level to improve the environmental conditions in these areas. Based on the available information such as air and water quality data, assessment of CPCB during surveys, monitoring & inspections, public complaints, complaints under VIP references, parliament questions and visual environmental conditions, a list of the potentially polluted areas were prepared by CPCB and State Pollution Control Boards (SPCBs). The issue was discussed in depth in the **29th** Conference of Chairmen and Member Secretaries of SPCBs/ PCCs held in May 1989 and accordingly, ten Critically Polluted Areas (CPAs) were identified to evolve a comprehensive time bound programme for each of the problem areas with objective of improvement of overall environmental quality. Subsequently 14 more significantly polluted areas were added and as result, the total number of indentified CPAs had become 24.

Since the inception of the programme, CPCB has formulated Action Plans to mitigate the environmental pollution problems for each of the CPAs and implementation of action plans along with the environmental status are being reviewed from time to time. These Action Plans were also revised from time to time by adding some new action points, whenever required.

During 2009-10, Central Pollution Control Board (CPCB) in collaboration with Indian Institute of Technology (IIT), Delhi had carried out comprehensive environmental assessment of 88 prominent industrial clusters based on Comprehensive Environmental Pollution Index (CEPI) criteria. Out of identified 88 prominent industrial clusters, 43 industrial clusters in 16 States having CEPI score of 70 and above are identified as Critically Polluted Industrial Clusters. Further, 32 industrial clusters with CEPI scores between 60 & 70 are categorized as severely polluted areas.

11.4.1 Action Plan for CPA

11.4.1.1 Preparation of Remedial Action Plans

As per the direction of MoEF, remedial Action Plans for the identified 43 critically polluted areas were prepared by concerned SPCBs/PCCs based on the Terms of Reference (ToR) and Model frame of Action Plan prepared by the Central Pollution Control Board. These draft Action Plans were initially reviewed by Steering Committee comprising national level experts and subsequently by an In-house committee of Central Pollution Control Board. Till date, Action Plans of 42 industrial clusters have already been finalized in light of the suggestions of national-level Steering Committee and In-house committee of CPCB.

11.4.1.2 Monitoring of Implementation of Action Plans

- For strict implementation of Action Plans prepared by respective State Pollution Control Boards, the Central Pollution Control Board has requested SPCBs to constitute local committees for field visit / review and verification of implementation of Action Plans and to submit progress on bi-monthly basis to Central Pollution Control Board.
- Accordingly the State Pollution Control Boards have constituted local committees for implementation of Action Plans in 35 CPAs i.e. Navi Mumbai, Chandrapur, Dombivali, Aurangabad, Tarapur, Panipat, Faridabad, Haldia, Asansole, Howrah, Greater Kochi, Vishakhapatnam, Patancheru-Bolaram, Dhanbad, Ludhiana, Mandi-Gobindgarh, IbValley, Jharsugda, Angul Talcher, Manglore, Bhadravati, Vapi, Ankleshwar, Ahmedabad, Vatva, Bhavnagar, Junagarh, Indore, Korba, Ghaziabad, Noida, Kanpur, Agra, Varanasi-Mirzapur and Singrauli comprising various stakeholders, local representatives & government departments.
- In the States of Tamilnadu, Rajasthan and Delhi, no such local committees are constituted and in these areas, the SPCBs are self monitoring the progress of implementation of action plans.

11.4.1.3 Current status of the Action Plans of 43 Critically Polluted Areas

Total No. of identified Critically Polluted Areas	43
Industrial Clusters for which Action Plans have been finalized	42
Industrial Clusters from where final Action Plans are yet to be finalized *(Delhi-Najafgarh drain basin)*	01
Industrial Clusters from where moratorium lifted till September, 2013	28
Industrial Clusters from where moratorium is still in-force	15

11.4.1.4 Monitoring and Status of Moratorium in Critically Polluted Areas

- Ministry of Environment & Forests, Government of India had imposed temporary moratorium on consideration of new projects /expansion of existing projects for environmental clearance to be located in Critically Polluted Areas, vide Office Memorandum, dated 13.01.2010
- Initially, MoEF had adopted a policy of lifting of moratorium conditionally on submission of verified progress reports from concerning State pollution Control Boards in line of initiation/implementation of ground work towards implementation of Action Plans. On the basis of this policy, moratorium has been lifted from 26 CPAs, vide their O.M., dated 26.10.2010, 15.02.2011, 31.03.11, 23.05.2011 & 05.07.11 respectively

- Environmental quality monitoring is being carried out by CPCB periodically through environmental laboratories recognized under the E(P) Act, 1986 and CEPI is being assessed based on the recorded monitoring data in the 43 CPAs. Entire monitoring work is being done in co-ordination with concerned SPCBs. The evaluated CEPI reflects the environmental quality of the 43 CPAs and also serves as a yardstick to assess the progress achieved in the implementation of action plans. So far, three rounds of monitoring have been undertaken by CPCB (2009, 2011, 2013) based on which CEPI has been evaluated.
- Based on the CEPI scores, MoEF vide O.M. dated 17th September, 2013 has lifted moratorium in those 10 CPAs where CEPI scores are below 80 and has shown a decreasing trend as compared to the CEPI score assessed by CPCB in 2011.
- Simultaneously, MoEF vide another O.M. dated 17th September, 2013 has re-imposed moratorium in those 8 CPAs where CEPI values are either still above 80 or are above 70 alongwith increasing trend as compared to CEPI values assessed earlier by CPCB in 2011. Thus, the trend in the CEPI value (reflecting the environmental quality) has been the deciding factor in the lifting /re-imposing of moratorium in the 43 CPAs.
- The updated status of moratorium and CEPI scores of the CPAs are presented in the following table :

Sl. No.	Industrial Cluster / Area	2009	2011	2013
PART-A : 28 CPAs where moratorium has been lifted :				
	CPAs where CEPI score is decreasing as compared to 2011:			
1	Agra (Uttar Pradesh)	76.48	88.36	68.71
2	Ahmedabad (Gujarat)	75.28	78.09	69.54
3	Angul Talcher (Orissa)	82.09	89.74	72.86
4	Asansole (West Bengal)	70.20	70.96	56.01
5	Aurangabad (Maharashtra)	77.44	83.10	68.87
6	Bhadravathi (Karnataka)	72.33	62.64	45.27
7	Bhavnagar (Gujarat)	70.99	69.73	62.79
8	Bhiwadi (Rajasthan)	82.91	77.73	70.63
9	Coimbatore (Tamil Nadu)	72.38	54.16	53.14
10	Cuddalore (Tamil Nadu)	77.45	78.41	70.12
11	Dhanbad (Jharkhand)	78.63	80.17	71.78
12	Dombivalli (Maharashtra)	78.41	85.21	72.29
13	Faridabad (Haryana)	77.07	74.42	73.55
14	Greater Kochi (Kerala)	75.08	57.39	57.94
15	Haldia (West Bengal)	75.43	79.71	61.58
16	Howrah (West Bengal)	74.84	76.88	61.11
17	Ib Valley (Orissa)	74.00	65.68	59.73
18	Junagarh (Gujarat)	70.82	67.85	52.75

Sl. No.	Industrial Cluster / Area	2009	2011	2013
19	Kanpur (Uttar Pradesh)	78.09	88.82	72.31
20	Korba (Chhattisgarh)	83.00	82.84	69.11
21	Manali (Tamil Nadu)	76.32	88.88	77.26
22	Mandi Gobindgarh (Punjab)	75.08	79.06	77.98
23	Mangalore (Karnataka)	73.68	73.86	67.62
24	Navi Mumbai (Maharashtra)	73.77	78.51	72.87
25	Noida (Uttar Pradesh)	78.9	80.72	78.69
26	Tarapur (Maharashtra)	72.01	85.24	73.30
27	Varanasi-Mirzapur (Uttar Pradesh)	73.79	73.66	56.91
28	Vishakhapatnam (Andhra Pradesh)	70.82	57.39	52.31
PART-B: 15 CPAs where moratorium is currently in place				
	CPAs where CEPI score is above 80 due to which moratorium was continued			
1	Ankleshwar (Gujarat)	88.50	85.75	80.93
2	Chandrapur (Maharashtra)	83.88	83.82	81.90
3	Pali (Rajasthan)	73.73	85.26	82.71
4	Vatva (Gujarat)	74.77	87.46	83.44
5	Vellore (North Arcot) (Tamil Nadu)	81.79	84.73	79.67
	CPAs where CEPI score is above 80 due to which moratorium was re-imposed			
6	Ghaziabad (Uttar Pradesh)	87.37	79.71	84.13
7	Panipat (Haryana)	71.91	85.07	81.27
8	Singrauli (Uttar Pradesh & Madya Pradesh)	81.73	83.35	83.24
9	Vapi (Gujarat)	88.09	90.75	85.31
	CPAs where CEPI score is increasing as compared to 2011 due to which moratorium was re-imposed			
10	Indore (Madhya Pradesh)	71.26	78.67	78.75
11	Jharsuguda (Orissa)	73.34	67.48	73.31
12	Ludhiana (Punjab)	81.66	73.23	75.72
13	Patancheru Bollaram (Andhra Pradesh)	70.07	74.58	76.05
	CPAs where CEPI score has not shown significant improvement as compared to 2011 due to which moratorium was continued			
14	Jodhpur (Rajasthan)	75.19	78.20	78.00
15	Nazafgarh Drain Basin (Delhi)	79.54	67.07	73.42

11.4.4 Environmental Quality Monitoring in Critically Polluted Areas

11.4.4.1 Environmental Quality Monitoring in 10 CPAs

- The entire exercise of monitoring in CPAs & re-assessment of CEPI scores is being repeated on priority in those CPAs where the moratorium is re-imposed as per details given below :

- 08 CPAs where moratorium is re-imposed (Vapi, Patancheru – Bollaram, Jharsuguda, Ludhiana, Panipat, Ghaziabad, Singrauli and Indore)
- 02 CPAs where moratorium was already in-force. These are Ankleshwar and Vatva.

11.4.4.2 MoEF Directives for Environmental Quality Monitoring in CPAs

- MoEF has directed CPCB to conduct environmental quality monitoring through third party in all the CPAs on biennial basis and based on the recorded monitoring data, CEPI assessment will be carried out and the trend analysis of CEPI would be communicated to MoEF for taking appropriate decision on lifting/re-imposing moratorium in the respective CPAs.
- MoEF vide O. M. dated 17th September, 2013 also directed that CPCB would submit a status report on CEPI based on the third party monitoring to be undertaken by concerned SPCB on annual basis.
- MoEF vide O. M. dated 17th September, 2013 directed that if at any time it comes to the notice of CPCB that action plan in any CPA is not being implemented properly or the CEPI index in CPA is showing an increasing trend, the factual position will be brought to the notice of MoEF and MoEF would take an appropriate view in the matter which may include re-imposition of moratorium.

11.4.5 Software for Assessment of CEPI in Industrial Clusters

The assessment of CEPI is a dynamic process and based on the annual average data bank CEPI may be calculated regularly so that the impact and effect of enforcement could be evaluated in terms of improvement in environmental quality of selected industrial clusters. Therefore, a software is being developed by Central Pollution Control Board through M/s DOEACC Society (NIELIT) , Chandigarh for web-based online calculation of CEPI, which would be shared with SPCBs / public. The software would enable the concerned SPCBs / PCCs / common people to recalculate the CEPI for their area on regular basis to ensure better enforcement and compliance. The software would further help the SPCBs / PCC in keeping a constant vigil on environmental status of existing and new industrial areas on the basis of CEPI thereby, preventing their degradation. A training programme on the demo-software was organized at CPCB, Delhi during Jan. 23-24, 2012 which was attended by the officers from various SPCBs and Zonal offices of CPCB. The software has been already developed and Security Audit of which is under progress.

11.4.6 Recommendations of the Working Group constituted for addressing various issues related to CPAs

In pursuance to the decisions of the 56th Conference of Chairmen and Member Secretaries of CPCB and SPCBs/PCCs, a 'Working Group' comprising officials of the SPCBs of Gujarat, Maharashtra, Tamilnadu & Uttar Pradesh as members and

CPCB as Member Convener was constituted. A report has been prepared by CPCB addressing various issues related to CPAs and the same will be circulated among the concerned SPCBs/PCCs of 43 Critically Polluted Areas. Some of the important recommendations of the Working Group are as follows-

11.4.6.1 Implementation of Action Plans in 43 Critically Polluted Areas

i. For effective monitoring of implementation of Action Plans, constitution of 'Local Stakeholders Committees' comprising of all the local stakeholders and technical experts and convening of the meetings on bi-monthly basis, are suggested. Such Committee need to be headed by Chief Secretary of concerned State for effective implementation of Action Plans. Accordingly the State Pollution Control Boards have constituted local committees to assess the implementation of Action Plans in 35 CPAs. The industrial clusters where local committees are not constituted, the SPCBs are again requested to constitute such committees and monitor the progress of the implementation of action plans.
ii. The State Board should be a responsible implementing agency and should co-ordinate with other government agencies / stakeholders for effective implementation of action plans within the stipulated time frame.
iii. State Government should allocate adequate funds for implementation of Action Plan and strengthening of SPCBs.
iv. The Action Plan should be incorporated in the State Environmental Policy.

11.4.6.2 Guidelines for Monitoring Mechanism

i. Sampling and Analysis work should be conducted through E(P)A/NABL recognized/approved environmental labs/agencies.
ii. The Executing Agency shall collect samples of Ambient Air, surface water and ground water from atleast 4 locations of each area at a frequency of three samples per year.
iii. Bio-assay test should also be conducted on selected samples as per requirement to determine the toxicity.
iv. The Executing agency shall carry out the monitoring, sampling and analysis works as per the notified standard methods and as per the norms.
v. The Executing Agency shall ensure that all the instruments / equipments / glass-wares etc. to be utilized in monitoring work and analysis of samples, are properly calibrated.
vi. The sampling points shall be finalized in consultation with State Pollution Control Board & the same shall be fixed on the co-ordinates of latitude and longitude using GPS instruments.
vii. The sampling locations in the critically polluted areas should be selected in such a way so that it fulfills the criteria of representative sampling w.r.t meteorological and environmental conditions of the area.

viii. The Executing agency shall submit the complete monitoring, sampling and analysis reports including summary of the parameters exceeding the prescribed standards / norms for each of CPAs to concerning SPCB.

11.4.6.3 Special recommendations on CPAs

i. Monitoring for CETP, FETP, STP and river / drains will be carried out for 2-3 days.

ii. Flow based composite samples and daily grab samples shall be collected at CETP/ETP/FETP outlet over a period of 2-3 days (round the clock) & STP for 1 day and based on the results of composite and grab samples, a factor will be established for slot-wise pollution load. These pollution load factors will be useful to estimate the total pollution load in case of limited period monitoring in future.

iii. The concerned SPCBs will issue directions to industries (having flow > 100 m^3/day) /CETP & STP operators for installation of flow measuring devices at inlet and outlet of ETP/ STP/ CETP/ FETP within next 6 months and also for maintaining records of electricity meter reading.

iv. Installation of online 'Continuous Source/ Ambient Air Quality Monitoring Stations' should also be ensured and the data acquired so be displayed on website of State Board for transparency in law-enforcement.

v. Atleast 2 CAAQMS need to be installed, one each in the windward and leeward direction in each of the Critically Polluted Areas where at present, no CAAQMS is available.

vi. The ambient air quality monitoring network (CAAQMS) in CPAs established by 17 Category of highly polluting industries, will be redesigned by shifting/ relocating of few stations to cover the entire city/area. This will reduce duplicity in monitoring and ensure optimum utilization of the available monitoring facilities and resources.

vii. Manual monitoring will also be conducted atleast once in a month on 24 hourly basis.

viii. Source apportionment study should be initiated in CPAs.

ix. Ground Water Quality Monitoring should be carried out at existing locations (i.e. bore-wells, tube wells, deep hand pumps etc) and as per national monitoring protocol. Monitoring of heavy metals, VOCs and Pesticides should also be undertaken in addition to regular parameters.

x. The large water polluting units of 17 Categories of industries, Textile/ Dying units and Dairies discharging more than 100KLD of waste water should install online water quality monitoring systems.

xi. Municipal Sewage and MSW are the main sources of water pollution. As the Urban Local Bodies are generally non- complying, directions under Section

5 of Environment (Protection) Act or a letter from MoEF should be sent to the concerned State Government/ Authorities for proper management of these wastes in time bound manner. It will help in activating the Urban Local Bodies for action.

11.4.6.4 Preparation of Action Plans for Severely Polluted Areas

During the earlier assessment of CEPI in 2010, 32 areas with CEPI score between 60-70 were declared as Severely Polluted. Following steps shall be taken in the identified severely polluted industrial clusters:

1. Remedial Action Plans shall be prepared by the concerned State Boards for the severely polluted industrial clusters falling under their jurisdiction. Framework of model Action Plan shall be followed in the preparation of Action Plan. The State Boards / PCC shall implement the Action Plans in co-ordination with local stakeholders.
2. Environmental Quality Monitoring shall be carried out in the identified industrial clusters by the respective SPCBs.
3. Comprehensive Environmental Assessment of identified industrial clusters shall be carried out based on CEPI criteria using the latest monitoring data.
4. The implementation of Action Plans shall be monitored by a local level committee comprising of technical experts of State Board and local stakeholders under the chairmanship of Chief Secretary of the State.

The above exercise will prove as a preventive measure for the severely polluted industrial clusters from turning into the category of critically polluted clusters.

11.4.6.5 Strategy for Comprehensive environmental status of industrial clusters which were missed out / not considered during the first CEPI study

During the earlier assessment of industrial clusters based on CEPI criteria, many of the industrial clusters which are polluted but missed out inadvertently. Following steps should be taken up in such missed out industrial clusters:

1. The State Boards / PCCs shall identify those industrial clusters for which comprehensive environmental assessment needs to be carried out.
2. Environmental Quality Monitoring shall be carried out in the identified industrial clusters in accordance with the guidelines suggested by Working Group.
3. Comprehensive Environmental Assessment of identified industrial clusters shall be carried out based on CEPI criteria using the latest monitoring data.
4. Remedial Action Plans shall be prepared by the concerned State Boards for the critically polluted industrial clusters as identified based on the study as detailed in point nos. 1 to 3 above. Framework of model Action Plan shall be followed in the preparation of Action Plan.

The above exercise will be helpful in taking corrective measures in the industrial clusters which will be identified as critically polluted. At the same time, the exercise will be a preventive measure for industrial clusters from further deterioration of environmental quality.

11.4.6.6 Moratorium in Critically Polluted Areas

- Initially, MoEF has adopted a policy of lifting of moratorium conditionally on submission of verified progress reports from concerning State pollution Control Boards in line of initiation/implementation of works on Action Plans. The Working Group recommended that if the CEPI score of industrial clusters are not reduced even after implementation of long-term action plans, then the *MoEF should think about re-imposition of moratorium in CPAs.*
- *MoEF should extend moratorium in those areas where the concerned SPCBs are yet to submit the progress report on implementation of the Action Plans. Similar policy needs to be adopted for those CPA which is yet to submit the final action plans.*

11.4.6.7 Regarding Health Impact Assessment

- The agencies like local medical colleges / ICMR / NIOH / District Hospitals should be recognized for the purpose of health studies.
- Financial assistance for carrying out the health studies should be met by applying Polluter pays principle.
- The concerned SPCBs should co-ordinate with State Health Departments / Industry associations / Individual industries etc. in the execution of the studies.
- State Health Departments should be directed to constitute a local committee comprising of experts of various organizations like Department of Family & Welfare, Occupational Health Safety Department, Disaster Management, SPCBs, representatives of local industrial association, etc. for the above purpose.
- NGOs having capacity to conduct health studies should be identified and promoted for collection of basic data related to impact of pollutants on public health in the vicinity of the CPA.
- Each polluting industry (Large & Medium) shall ensure regular health check up of their workers and their residential colonies on annual basis and these data should be submitted to respective State Pollution Control Boards.

11.4.6.8 Regarding Third Party Audit

i. Sector-specific formats should be developed in 17 categories of industries.

ii. The format should include energy consumption, cleaner production technology, measurement of energy consumption in pollution control systems, effluent flow measurement, qualification of manpower employed for operating pollution control systems, resource recovery / reuse, health and safety, occupational hazards, housekeeping, leakages, noise and odour control and receipt of public complaints.

iii. Material and mass balance should be included in relevant industrial sectors.

iv. Self-monitoring system in the industrial sectors should be strengthened through consent mechanism.

v. Transparency in the empanelment of auditors alongwith accountability of the Audit with provision of penalizing / blacklisting should be ensured.

vi. Manpower in SPCBs should be strengthened to examine and verify the reliability of the data as submitted by Annual Environment Statement (AES) auditors. A uniform methodology for verification of statements and assessment of reliability of submitted information should be developed.

vii. Modus-operandi for third party auditing of the AES should be notified by MoEF.

viii. Committee for third party auditing may comprise of experts from IIT/ NIT/ Engineering College/ Approved Consultant of MoEF.

11.5 58TH CONFERENCE OF CHAIRMEN AND MEMBER SECRETARIES OF CPCB AND SPCBS/ PCCS:

The conference as referred above was held at Bangalore during Feb. 22-23, 2014 wherein various issues pertaining to ESS Activities and Critically Polluted areas were addressed and accordingly resolutions were made by the members of the house.

Item : Inventorisation of Industries under 17 Categories of Highly Polluting Industries

The importance and status of the Inventorisation of Industries under 17 Categories of Highly Polluting Industries was presented during the conference and following points were realized :

- Data are not submitted regularly by most of the SPCBs/PCCs
- Data reported by some of SPCBs are more than 03 years old.
- No data is submitted by two SPCBs/PCC.
- No information is provided on 'Action Taken against Defaulting Industries' by the SPCBs/PCCs.

It was unanimously resolved that all the SPCBs / PCCs shall submit the updated information of 17 categories of highly polluting industries on regular basis to CPCB including information on 'Action Taken against Defaulting Industries'.

❖ **Inventorisation of Grossly Polluting Industries**

In a similar way, the significance and status of 'Inventorisation of the Grossly Polluting Industries' was discussed and following issues emerged:

- o Most of the SPCBs/PCCs are not submitting information on regular basis to CPCB.
- o No information is submitted by seven SPCBs/PCCs
- o Action taken against defaulting industries, is not highlighted in the reports or no separate information on this issue is sent to CPCB
- o Large variation are observed in the numbers of GPI located in different States. There are 697 nos. of GPIs operating in 4 States namely U.P, WB, Bihar & Uttarakhand while remaining 142 nos. of GPIs are located in other States.
- o Several large states have reported no. of GPIs to be less than 5: Maharashtra (2 nos.); Gujarat (3 nos.); TN (1 no.) & MP(1 no.)

It was resolved that all the SPCBs / PCCs shall thoroughly revise the information on grossly polluting industries (GPI) and submit the updated inventory of on regular basis to CPCB including information on 'Action Taken against Defaulting Industries'.

Item : Issues related to Critically Polluted Areas and Severally Polluted Areas

The present status of the issues related to Critically Polluted Areas (CPAs) and Severally Polluted Areas (SPAs) were presented before the house. The issues were as follows :

- o The review of the action plans framed for CPAs are not undertaken on regular basis at the Local (District) and State levels in respect of most of the CPAs
- o No progress reports on 'Implementation of the Action Plans' are being received by CPCB.
- o Environmental quality monitoring in CPAs, is not being conducted by the concerned SPCBs.
- o No action plans are prepared for the SPAs / areas missed during the assessment in 2010.

For restoration of the normal environmental conditions in CPAs, SPAs and other 'Hot Spots', following resolutions were made :

- **Review of Action Plans**
  - o 'Action Plan Monitoring Committees ' be formed in all the CPAs and meeting be convened as follows :

Level of Committee	To be Headed By	Frequency
Local Stake Holders Committee	District Magistrate	Bi-monthly
State Level Committee	Chief Secretary – State Govt.	Quarterly
National Level Committee (Technical Review Committee)	Secretary, MoEF	Bi-annually

- o Progress Reports on 'Implementation of the Action Plans' and 'Minutes of the Meeting ' be submitted on regular basis by the concerned SPCBs to CPCB.
- o The concerned SPCB to ensure that any new project / activity or any expansion or modernization of existing project or activity or any change in product mix is in line with the overall approved action plan of the concerned CPA.
- o The implementation of action plan of every CPA to be reviewed by the concerned Chairman, SPCB on quarterly basis and report sent to CPCB by the 7th day of the month succeeding the end of quarter.
- o Monitoring in CPAs be got done by SPCB through a third party on annual basis for computing CEPI. The monitoring be done during December-February and the report will be sent to CPCB by April. CPCB, in turn, to submit its report to MoEF.
- o Monitoring in CPAs be got done by CPCB through a third party on biennial basis (once in 2 years) for computing CEPI and report submitted to MoEF for taking an appropriate view.
- o If at any time it comes to the notice of CPCB that action plan in any CPA is not being implemented properly or the CEPI index in CPA is showing an increasing trend, it will immediately bring the factual position to the notice of MoEF and MoEF would consider taking an appropriate view in the matter which may include re-imposition of moratorium.

- **Implementations of the recommendations of the Working Group :**

In pursuance to the decisions of the 56th & 57th Conference of Chairmen and Member Secretaries of CPCB and SPCBs/PCCs, a 'Working Group (WG)' comprising officials of the SPCBs of Gujarat, Maharashtra, Tamilnadu & Uttar Pradesh as members and CPCB as Member Convener was constituted. Detailed discussion on the suggestions made by the WG was made during the 58th Conference and it was decided that the recommendations of the WG be implemented in 'Letter & Spirit'. It was decided that the report of the WG shall be re-circulated among all the SPCBs / PCCs. Some of the important recommendations made by WG which were discussed during the deliberations are as follows :

- o Timely implementation of Action Plans prepared for 43 Critically Polluted Areas.
- o Formation of Review Committees at different levels.
- o The State Board should be a responsible implementing agency and should co-ordinate with other government agencies / stakeholders for effective implementation of action plans within the stipulated time frame.

- o State Government should allocate adequate funds for implementation of Action Plan and strengthening of SPCBs.
- o The Action Plan should be incorporated in the State Environmental Policy.
- o Guidelines proposed for 'Monitoring Mechanism' be followed.
- o By applying 'Polluter Pays Principle', installation of online 'Continuous Source/ Ambient Air Quality Monitoring Stations' should also be ensured and the data acquired so be displayed on website of State Board for transparency in law-enforcement.
- o Atleast 2 CAAQMS need to be installed, one each in the windward and leeward direction in each of the Critically Polluted Areas where at present, no CAAQMS is available.
- o The ambient air quality monitoring network (CAAQMS) in CPAs established by 17 Category of highly polluting industries, will be redesigned by shifting/ relocating of few stations to cover the entire city/area. This will reduce duplicity in monitoring and ensure optimum utilization of the available monitoring facilities and resources.
- o Manual monitoring will also be conducted atleast once in a month on 24 hourly basis.
- o Source apportionment study should be initiated in CPAs.
- o Ground Water Quality Monitoring should be carried out at existing locations (i.e. bore-wells, tube wells, deep hand pumps etc) and as per national monitoring protocol. Monitoring of heavy metals, VOCs and Pesticides should also be undertaken in addition to regular parameters.
- o The large water polluting units of 17 Categories of industries, Textile/ Dying units and Dairies discharging more than 100KLD of waste water should install online water quality monitoring systems.
- o Preparation of Action Plans for Severely Polluted Areas.
- o Strategy for Comprehensive environmental status of industrial clusters which were missed out / not considered during the first CEPI study.
- o Studies on 'Health Impact Assessment' shall be initiated.

It was agreed upon that all the issues as deliberated in the conference and referred above including implementation of the recommendations of the WG shall be taken on priority by the concerned SPCBs / CPCB.

Item : Preparation of Inventory of Red Category Industries

Discussions were made during the conference on the issue of "Preparation of Inventory of Red Category Industries in 16 States having CPAs." Following points were presented for ready reference of the concerned States.

- Sixteen SPCBs/PCC were requested for preparation and transmission of 'Inventory of Red Category of Industries' operating in the respective states. These sixteen SPCBs/PCC were those in which the 43 critically polluted areas are located.
- As granting of Consent to Establish/ Operate & Authorization under HW(M,H& TBM) , Rules, 2008 to industries is the routine work of SPCBs, it was presumed that the desired information would be readily available with SPCBs/PCC.
- Considering the above aspect, a token amount of Rs. 2.00 Lacs (Rs. Two Lacs only) was released in Oct. 2010 to each of the above mentioned 16 States for documentation of information on Red Category of industries.
- It was observed that the response received from the SPCBs was not as per expectations. The following status of the project was presented before the Conference:

Sl. No.	States/UTs	Status
1	Chhattisgarh, Delhi, Haryana, Kerala, Madhya Pradesh, Rajasthan (6 SPCBs)	No response
2	Andhra Pradesh, Jharkhand, Karnataka, Punjab, Uttar Pradesh, West Bengal, Tamil Nadu (7 SPCBs)	Completed
3	Maharashtra, Orissa (2 SPCBs)	Hard Copy submitted/ Soft Copy Awaited
4	Gujarat	Soft Copy submitted/ hard copy awaited

Note: *Utilization Certificates are not submitted by Tamil Nadu, Orissa & Gujarat (3 No.)*

It was resolved that the concerned SPCBs shall forward the information in hard as well as soft copies (as the case may be) on priority.

Item : Surprise Inspection of Industries under ESS Programme

The surprise inspections under ESS scheme are being carried out by CPCB as per specified procedure to strengthen the pollution control compliance mechanism. The regions & industries to be inspected are selected through a well designed software. The complete scheme of the 'Surprise Inspection of the industries falling under 17 Categories of Highly Polluting Industries' being practiced by CPCB was presented before the conference.

After thorough discussion , following resolutions were made by the House :

- The SPCBs/PCCs will also strengthen enforcement of pollution control norms in their respective States to bring down the level of non-compliance.

- ❖ The SPCBs/PCCs will implement similar Scheme of 'Surprise Inspections' in their respective States /UTs to strengthen enforcement.
- ❖ On pilot study basis, joint surprise inspections comprising the officers of CPCB & concerned SPCB/PCC will be undertaken. This will facilitate share of expertise and enhanced transparency in the inspections.

Item No. : Issues Related to Harmonization of Classification of Industries under Red / Green / Orange Categories

The issue was discussed at length during the conference. It was reminded to the SPCBs / PCCs that following 'Directions' were issued by CPCB on 04/06/2012 under Section 18(1)(b) of the Water (Prevention & Control of Pollution) , Act, 1974 on the subject to all SPCBs/PCCs :

- To maintain uniformity in categorization of industries as red, green and orange, the SPCBs/PCCs shall adopt the list prepared by 'Working Group' as given at Table 7.3, 7.4 & 7.5 in the final report, for grant of Consent, inventorisation of industries in red, green & orange category and other related activities.
- The SPCBs/PCCs shall revise the list of red, green and orange category of industries available with them based on the criteria specified in the enclosed report in their State/UT and submit the same to CPCB within 90 days of receipt of this letter. A hard copy as well as soft copy of the same shall be submitted.

Based on the inputs given by the SPCBs / PCCs regarding difficulties faced in adaptation of the proposed categorization, following resolution were made by the Conference :

- A 'Working Group' headed by WBPCB and comprising of the members from CPCB, GPCB, TNPCB, MPPCB and UPPCB is constituted.
- This WG shall thoroughly review the issue and submit the final report based on the inputs given by different SPCBs / PCCs and also the representations received from various organizations / associations. The report shall cover the following :
    - o Crystal clear definition of the red, orange and green categories of the industries as was practiced during categorization of industries under 'Doon Valley Notification'.
    - o Final categorization of different types of the industries under Red, Green and Orange categories of the industries.
    - o The WG shall submit the final report by June 2014.

11.6 Activities pertaining to NGT (National Green Tribunal) & Other Court Cases

ESS Division in CPCB is looking after a number of cases which are under trial at the NGT. As per directives of NGT, various activities involving significant time and man power, are undertaken and reports are submitted to NGT on regular basis. These activities include:

- Inspection and monitoring of industries.
- Inspection of the hot-spots / critically / severally polluted areas
- Experts comments to the NGT on various issues
- Framing of policies/ mechanism in various cases and similar other cases.

CHAPTER XII
FINANCE AND ACCOUNTS

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032
BALANCE SHEET AS AT 31ST MARCH 2014

CORPUS/CAPITAL FUND AND LIABILITIES	SCHD.	CURRENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
CORPUS/CAPITAL FUND	1	206,922,636	247,836,126
RESERVE AND SURPLUS	2	-	-
EARMARKED/ ENDOWMENT FUND	3	873,752,993	960,986,505
SECURED LOANS AND BORROWINGS	4	-	-
UNSECURED LOANS AND BORROWINGS	5	-	-
DEFERRED CREDIT LIABILITIES	6	-	-
CURRENT LIABILITIES AND PROVISIONS	7	446,952,425	402,865,378
TOTAL		1,527,628,054	1,611,688,009
ASSETS			
FIXED ASSETS	8	172,361,796	223,457,730
INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS	9	-	-
INVESTMENTS-OTHERS	10	-	-
CURRENT ASSETS, LOANS, ADVANCES ETC	11	1,355,266,258	1,388,230,280
MISCELLANEOUS EXPENDITURE (to the extent not written off or adjusted)		-	-
TOTAL		1,527,628,054	1,611,688,009

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date
For Prakash Jain & Co.
Chartered Accountants
Firm Reg. No. 007405N

(K.C. Jain)
M.NO. 015438
Partner
Place: Delhi
Date: 30.01.2015

For Central Pollution Control Board

(Shashi Shekhar)
Chairman

(A.B. Akolkar)
Member Secretary

(Mahender Bansal)
Accounts Officer

(Mohan Kapur)
Assistant Accounts Officer

CHAPTER XII

FINANCE AND ACCOUNTS

Prakash Jain & Co.
Chartered Accountants

Flat No.6326, Sector B, Pocket 9,
Vasant Kunj, New Delhi-110070
Phone/Fax : 011- 41563827
Mobile : 9811373409
E-mail : rpshukla9@yahoo.com
rpshukla9@gmail.com

INDEPENDENT AUDITORS REPORT TO THE MEMBERS OF CENTRAL POLLUTION CONTROL BOARD-DELHI

1. We have audited the accompanying Financial Statements of **CENTRAL POLLUTION CONTROL BOARD, (Ministry of Environment Forests & Climate Change, Govt. of India), its Zonal Offices and sponsored projects which** comprise the Balance Sheet as at **31st March 2014** and Income & Expenditure Account and Statement of Receipts & Payments of the Board for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

2. Management of the Board is responsible for the preparation of these Financial Statements that give a true and fair view of the financial position, financial performance and Receipts & Payments of the Board in accordance with accounting principles generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

3. The Balance Sheet, Income & Expenditure Account and Statement of Receipts & Payments have been prepared in accordance with **'Form of Financial Statements for the Central Autonomous Bodies'** circulated by **Controller General of Accounts, Ministry of Finance.**

Auditor's Responsibility

4. Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

5. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Board's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also

includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

6. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Basis for Qualified Opinion

7. Depreciation is charged on Assets on SLM basis as per rates prescribed by Income Tax Act 1961. Depreciation has been charged on full year basis irrespective of date of purchase of Assets. Further depreciation has not been charged on individual asset basis instead of charged on gross block basis which has resulted into excess charging of depreciation and as such depreciation has not been charged as per Accounting Standard 6 (AS-6) issued by the Institute of Chartered Accountants of India.

8. Liability on account of LTC has neither been ascertained nor provided for. Accounting Standard 15 – "Accounts for Retirement Benefits – Revised" issued by the Institute of Chartered Accountants of India has not been complied with.

9. Liability on account of Tax deducted at Source under DVAT Act (Works Contract Tax) has not been deducted and paid in accordance with the requirements of the said Act; liability not ascertained. Further Tax Deducted at Source as per the requirement under the Income Tax Act has also not been fully complied with and liability on account of less deduction/ not deduction is Rs.63582/- (excluding interest and penalties) and not provided in the books of accounts.

Emphasis of matters

10. We draw attention to the following points:

I). Reconciliation & Confirmation of various accounts

The balance under various accounts amounting to Rs. 1.50 crores in liabilities side, and advance of Rs. 72.42 crores in assets side of the Balance Sheet (refer note no. 4 in Schedule 26 – notes to accounts) are subject to confirmation and reconciliation thereof. Further, most of the advances are pending for adjustment of long time (Rs. 31.83 crores outstanding for more than three years) and financial impact are not ascertainable and this may have material effect on Balance Sheet, the Income & Expenditure, and Receipts & Payment Account of the Board.

II). Loans and advances include following accounts /balances which are being carried forward since long time. It appears that expenditure against these payments has already been incurred but advances have not been adjusted and as such realisability/adjustability of the same cannot be commented upon.

a) Publication Advance : Rs. 55.62 lacs.

b) Purchase and other Advance : Rs. 22.60 lacs.

c) Advance to State Boards : Rs. 41.56 lacs.

d) Advance of Rs 6.21 lacs to Telco and Rs 14.00 lac to GTZ for fabrication of van under the project Orissa Board fabrication of mobile Van

e). Loans and Advance include Rs.1,14,940/- shown as imprest balance with an employee of the Board and is outstanding for adjustment for a longtime. It has been noticed /explained that no such imprest /cash balance is available.

III). Fixed Assets Register

a). It has been observed that fixed asset register has not been properly maintained at Head office and its Zonal Office, with respect to depreciation charged, location and identification number, Further Fixed Asset register has not been reconciled with financial records and discrepancies if any has not been ascertained. Physical verification of fixed assets conducted, has not been matched with fixed assets register to identify short/excess.

b). Capital work in progress include Rs. 20.11 lacs being advance given to suppliers (Delhi Zone) and have not been adjusted/transferred to fixed asset Account. In absence of details, we are unable to comment on adjustability/ realisability of the same.

IV). Current Liabilities

Above account include a sum of Rs. 91.46 lacs under the head Deposit (work) which represent surplus fund to be refunded to various agencies after completion of project but have not been refunded and is being carried forward as liability since long time. In our opinion, an appropriate policy in this regard should be framed and should be accounted for accordingly.

V). Internal Audit System

There is no internal audit system in the Board and further the internal control system need to be significantly strengthened to make it commensurate with the size and nature of activities of the Board, particularly in respect of obtaining utilization certificates.

VI). System of monitoring of projects assisted by the Board, obtaining utilization certificate and its adjustment needs to be strengthened.

VII). Central Pollution Control Board has created **Contributory Provident Fund (CPCB) under guidelines called The Central Board for the Prevention & Control of Water Pollution Employee's contributory Provident Fund since 1977-78** and the employee contribution is deducted from the salary of the employee and transferred to CPF Fund. **The accounts of CPF Fund are audited up to 31st March, 2007 only.** The shortfall in PF liability to be borne by Board, if any has not been ascertained.

Opinion

In our opinion and to the best of our information and according the explanations given to us the Balance sheet, Income & Expenditure Account and Statement of Receipts & Payments read together with the Accounting policies and notes to Accounts thereon, and subject to remarks Para 7 to 10 monetary impact of which is not ascertainable, give the information required by Law, in the manner so required and give true and fair view in conformity with the accounting principles generally accepted in India:

- In the case of Balance Sheet of the state of Affairs of the Board as at 31st March 2014.
- In the case of Income & Expenditure Account of the excess of Expenditure over income for the year ended on that date,
- In the case of Statement of Receipts & Payments of the Receipts & Payments for the year ended on that date.

FOR PRAKASH JAIN & CO.
CHARTERED ACCOUNTANTS
FIRM REGN. NO 007405N

Prakash Jain & Co. New Delhi Firm Regn. No. 007405N Chartered Accountants

(K.C. JAIN)
PARTNER (M. NO. 015438)

Place: New Delhi
Date: 30.01.2015

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

BALANCE SHEET AS AT 31ST MARCH 2014

CORPUS/CAPITAL FUND AND LIABILITIES	SCHD.	CURRENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
		-	-
CORPUS/CAPITAL FUND	1	206,922,636	247,836,126
RESERVE AND SURPLUS	2	-	-
EARMARKED/ ENDOWMENT FUND	3	873,752,993	960,986,505
SECURED LOANS AND BORROWINGS	4	-	-
UNSECURED LOANS AND BORROWINGS	5	-	-
DEFERRED CREDIT LIABILITIES	6	-	-
CURRENT LIABILITIES AND PROVISIONS	7	446,952,425	402,865,378
TOTAL		1,527,628,054	1,611,688,009
ASSETS			
FIXED ASSETS	8	172,361,796	223,457,730
INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS	9	-	-
INVESTMENTS-OTHERS	10	-	-
CURRENT ASSETS, LOANS, ADVANCES ETC	11	1,355,266,258	1,388,230,280
MISCELLANEOUS EXPENDITURE		-	-
(to the extent not written off or adjusted)			
TOTAL		1,527,628,054	1,611,688,009

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date
For Prakash Jain & Co.
Chartered Accountants
Firm Reg. No. 007405N

(K.C. Jain)
M.NO. 015438
Partner
Place: Delhi
Date: 30.01.2015

Prakash Jain & Co. New Delhi Firm Regn. No. 007405N Chartered Accountants

For Central Pollution Control Board

(Shashi Shekhar)
Chairman

(A.B. Akolkar)
Member Secretary

(Mahender Bansal)
Accounts Officer

(Mohan Kapur)
Assistant Accounts Officer

CENTRAL POLLUTION CONTROL BOARD

INCOME AND EXPENDITURE ACCOUNT

FOR THE YEAR ENDED 31ST MARCH 2014

INCOME	SCHD.	CURRENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
INCOME FROM SALES/ SERVICES	12	-	-
GRANTS/SUBSIDIES	13	689,000,000	464,880,000
FEES/ SUBSCRIPTIONS	14	-	-
INCOME FROM INVESTMENTS	15	-	-
(income on investments from earmarked/endowment funds		-	-
transferred to Funds)		-	-
INCOME FROM ROYALTY, PUBLICATIONS ETC.	16	230,631	656,140
INTEREST EARNED	17	624,856	2,741,585
OTHER INCOME	18	683,350	2,380,077
INCREASE/ DECREASE IN STOCK OF FINISHED GOODS &	19	1,072,600	(193,637)
WORKS -IN- PROGRESS			
TOTAL(A)		691,611,437	470,464,165
EXPENDITURE			
ESTABLISHMENT EXPENSES	20	379,804,920	365,205,766
OTHER ADMINISTRATIVE EXPENSES ETC	21	98,933,882	98,229,555
EXPENDITURE ON GRANTS, SUBSIDIES ETC	22	-	-
INTEREST	23	19,548	17,822
MONITORING EXPENSES	24	185,650,273	43,455,317
DEPRECIATION	8	62,884,381	60,238,479
TOTAL(B)		727,293,004	567,146,939
BALANCE BEING EXCESS OF INCOME OVER EXPENDITURE (A-B)		(35,681,568)	(96,682,775)
TRANSFERRED TO SPECIAL RESERVE		-	-
TRANSFERRED TO /FROM GENERAL RESERVE		-	-
PRIOR PERIOD EXPS.		4,785,923	45,714,598
BALANCE BEING SURPLUS/ DEFICIT CARRIED TO CORPUS /			
CAPITAL FUND		(40,467,491)	(142,397,373)

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date

For Prakash Jain & Co.
Chartered Accountants
Firm Reg. No. 007405N

(K.C. Jain)
M.NO. 073009
Partner
Place: Delhi
Date: 30.01.2015

Prakash Jain & Co. New Delhi Firm Regn. No. 007405 Chartered Accountants

(Shashi Shekhar)
Chairman

For Central Pollution Control Board

(A.B. Akolkar)
Member Secretary

(Mahender Bansal)
Accounts Officer

(Mohan Kapur)
Assistant Accounts Officer

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2014

		-		
SCHEDULE 1 - CORPUS / CAPITAL FUND	**CURRENT YEAR**		**PREVIOUS YEAR**	
	(AMOUNT IN Rs.)		**(AMOUNT IN Rs.)**	
BALANCE AS AT BEGINNIG OF THE YEAR	247,836,126		390,233,499	
Less:- DUE TO RECTIFICATION OF FIXED ASSETS				
LESS : REFUND OF CAPITAL	446,000		-	
Add:- OPENING BALANCE OF INCOME AND EXPENDITURE				
Add/LESS:- EXCESS OF INCOME OVER EXPENDITURE/ EXCESS OF	(40,467,491)	206,922,636	(142,397,373)	247,836,126
EXPENDITURE OVER INCOME				
BALANCE AS AT YEAR END		206,922,636		247,836,126
		-		
SCHEDULE 2 - RESERVE & SURPLUS	**CURRENT YEAR**		**PREVIOUS YEAR**	
1. CAPITAL RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
2. REVALUATION RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
3. SPECIAL RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
4. GENERAL RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 3 - EARMARKED / ENDOWMENT FUNDS	FUND WISE BREAKUP				TOTAL	
	SPONSORED PROJECTS	FUND XX	FUND YY	FUND ZZ	CUURENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
a) OPENING BALANCE OF THE FUND	960,986,505	-	-	-	960,986,505	526,790,587
Add : Prior Period adjustment	-	-	-	-	-	-3,795,871
b) ADDITION TO THE FUNDS	-	-	-	-	-	-
I. DONATION / GRANTS (NET OF REFUND)	31,538,629	-	-	-	31,538,629	603,307,680
II. INCOME FROM INVESTMENTS MADE ON ACCOUNT OF FUNDS	19,955,904	-	-	-	19,955,904	10,040,111
III. OTHER ADDITIONS (SPECIFY NATURE)	3,000,000	-	-	-	3,000,000	1,000,000
					-	-
TOTAL (A+B)	1,015,481,038	-	-	-	1,015,481,038	1,137,342,507
c) UTILISATION / EXPENDITURE TOWARDS OBJECTIVES OF FUND	-	-	-	-	-	-
I. CAPITAL EXPENDITURE	-	-	-	-	-	-
- FIXED ASSETS (Including Prior Period Adjustment)	-	-	-	-	-	-
- OTHERS	-	-	-	-	-	-
TOTAL	-	-	-	-	-	-
II. REVENUE EXPENDITURE						
- SALARIES, WAGES AND ALLOWANCES ETC.	10,741,487	-	-	-	10,741,487	5,071,210
- RENT	-	-	-	-	-	-
- OTHER ADMINSTRATIVE EXPENSES	78,072,887	-	-	-	78,072,887	54,792,084
TOTAL	88,814,374	-	-	-	88,814,374	59,863,294
TOTA (C)	88,814,374	-	-	-	88,814,374	59,863,294
D.) Refund to MoEF	52,913,671	-	-	-	52,913,671	116,492,708
NET BALANCE AS AT THE YEAR END (A+B-C-D)	873,752,993	-	-	-	873,752,993	960,986,505

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

	(AMOUNT IN Rs.)			
SCHEDULE 4 -SECURED LOANS AND BORROWINGS	CURRENT YEAR		PREVIOUS YEAR	
1.CENTRAL GOVERNMENT		-		-
2.STATE GOVERNMENT (Specify)		-		-
3.FINANCIAL INSTITUTION				
a) Term Loans	-		-	
b) Interest accrued and due	-	-	-	-
4.BANKS:				
a) Term Loans				
-Interest accrued and due	-		-	
b) Other Loans (specify)				
-Interest accrued and due	-	-	-	-
5.OTHER INSTITUTION AND AGENCIES		-		-
6.DEBENTURES AND BONDS		-		-
7.OTHERS (Specify)		-		-
Total		-		-
Note: Amounts due within one year				

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

	(AMOUNT IN Rs.)			
SCHEDULE 5 -UNSECURED LOANS AND BORROWINGS	CURRENT YEAR		PREVIOUS YEAR	
1.CENTRAL GOVERNMENT		-		-
2.STATE GOVERNMENT (Specify)		-		-
3.FINANCIAL INSTITUTION		-		-
4.BANKS:				
a) Term Loans	-		-	
b) Other Loans (specify)	-	-	-	-
5.OTHER INSTITUTION AND AGENCIES	-	-	-	-
6.DEBENTURES AND BONDS		-		-
7. FIXED DEPOSITS		-		-
8.OTHERS (Specify)		-		-
TOTAL		-		-
Note: Amounts due within one year				

			(AMOUNT IN Rs.)	
SCHEDULE 6 -DEFERRED CREDIT LIABILITIES			CURRENT YEAR	PREVIOUS YEAR
a) Acceptence secured by hypothecation of capital equipment and other assets			-	-
b) Others			-	-
			-	-

Prakash Jain & Co.
New Delhi
Firm Regn. No.: 007405N
Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 7 - CURRENT LIABILITIES AND PROVISIONS	CURRENT YEAR (AMOUNT IN Rs.)		PREVIOUS YEAR (AMOUNT IN Rs.)	
A. CURRENT LIABILITIES				
1. Acceptances		-		-
2. Sundry Creditors:				
a) For goods	-		-	
b) Others	13,567,825	13,567,825	3,713,963	3,713,963
3. Advances Received		12,772,428		11,566,495
4. Interest accrued but not due on:				
a) Secured Loans/borrowings	-		-	
b) Unsecured Loans/borrowings	-	-	-	-
5. Statutory Liabilities:	-		-	
a) Overdue	-		-	
b) Others	-	-	-	-
6. Other current Liabilities (Sponsored Projects)		35,827,207		40,020,685
TOTAL (A)		62,167,460		55,301,143
B. PROVISIONS				
1. For Taxation		-		-
2. Gratuity		222,178,795		202,915,313
3. Superannuation/Pension		-		-
4. Accumulated Leave Encashment		162,606,170		144,648,922
5. Trade Warranties/Claims		-		-
6. Others (Specify)		-		-
		-		-
TOTAL (B)		384,784,965		347,564,235
TOTAL (A+B)		446,952,425		402,865,378

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 8 -FIXED ASSETS

DESCRIPTION		GROSS BLOCK				AMORTISATION/DEPRECIATION					NET BLOCK	
	DEP. RATE	Cost/valuation as at beginning of the Year(original cost)	Addition during the year	Deductions/Adjustments during the year	Cost/valuation at the year end(originl cost)	As at the beginning of the Year	Prior Period Dep.	During the Year	On Deductions during the Year	At the end of the year	As at the current Year -end	As at the Previous Year - end
FIXED ASSETS:												
LAND:												
a) Freehold	-	-	-	-	-	-		-	-	-	-	-
b) Leasehold	-	12,505,904	-	-	12,505,904	1,047,988	-	95,530	-	1,143,518	11,362,386	11,457,916
BUILDINGS:												
a) On Freehold Land		-	-	-	-	-		-	-	-	-	-
b) On Leasehold Land	-	118,457,538	415,878	95,000	118,778,416	42,948,684	-	11,877,842	-	54,826,526	63,951,890	75,508,854
c) Ownership Flats/Premises		-	-	-	-	-		-	-	-	-	-
d) Superstructures on Land not belonging to the entity		-	-	-	-	-		-	-	-	-	-
PLANT, MACHINERY & EQUIPMENT	15%	299,811,015	7,788,755	23,645	307,576,125	178,391,241	-	46,136,418	-	224,527,659	83,048,465	121,419,773
VEHICLES	15%	4,673,005	1,265,300	342,281	5,596,024	3,066,061	-	839,404	-	3,905,465	1,690,559	1,606,944
FURNITURE, FIXTURES,	10%	16,102,733	730,535	-	16,833,268	6,485,667	-	1,683,327	-	8,168,994	8,664,274	9,617,065
OFFICE EQUIPMENT	15%	-	-	-	-	-		-	-	-	-	-
COMPUTER/PERIPHERALS	60%	19,492,778	2,175,058	-	21,667,836	18,490,062	-	2,072,020	-	20,562,082	1,105,753	1,002,716
ELECTRIC INSTALLATIONS	15%	-	-	-	-	-		-	-	-	-	-
LIBRARY BOOKS	15%	1,026,621	213,386	293	1,239,714	773,795	-	179,840	-	953,635	286,080	252,826
TUBEWELLS & W.SUPPLY	15%	-	-	-	-	-		-	-	-	-	-
OTHER FIXED ASSETS	15%	-	-	-	-	-		-	-	-	-	-
TOTAL OF CURRENT YEAR		472,069,594	12,588,912	461,219	484,197,287	251,203,498	-	62,884,381	-	314,087,879	170,109,407	220,866,094
CAPITAL WORK-IN PROGRESS		2,591,636	-	339,247	2,252,389	-	-	-	-	-	2,252,389	2,591,636
TOTAL		474,661,230	12,588,912	800,466	486,449,676	251,203,498	-	62,884,381	-	314,087,879	172,361,796	223,457,730

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 9 -INVESTMENTS FROM EARMARKED/ ENDOWMENT FUNDS

	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. IN GOVERNMENT SECURITIES	-	-
2. OTHER APPROVED SECURITIES	-	-
3. SHARES	-	-
4. DEBENTURES AND NONDS	-	-
5. SUBSIDIARIES AND JOINT VENTURES	-	-
6. OTEHRS(TO BE SPECIFIED)	-	-
	-	-
Total	-	-

SCHEDULE-10 INVESTMENTS OTHERS	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. IN GOVERNMENT SECURITIES	-	-
2. OTHER APPROVED SECURITIES	-	-
3. SHARES	-	-
4. DEBENTURES AND NONDS	-	-
5. SUBSIDIARIES AND JOINT VENTURES	-	
6. OTEHRS(TO BE SPECIFIED)	-	-
Total		

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 11- CURRENT ASSETS, LOANS, AND ADVANCES	(AMOUNT IN Rs.)			
	CURRENT YEAR		PREVIOUS YEAR	
A) CURRENT ASSETS				
1. INVENTORIES				
a) Stores and spares	-		-	
b) Loose Tools	-		-	
c) Stock-in- trade	-		-	
Finished Goods	9,875,416		8,802,817	
Work -in- progress	-		-	
Raw materials	-	9,875,416	-	8,802,817
2. SUNDRY DEBTORS				
a) Debts outstanding for a period exceeding six months	-		-	
b) Others	-	-	-	-
3. Cash balances in hand (including cheques/drafts & imprest)		-		(219)
4.Bank Balances				
a)With scheduled banks				
-On current Accounts	282,052,219		335,833,683	
- On Deposits Accounts(including margine money)	38,011,098		13,306,559	
- On saving Accounts	296,571,299	616,634,616	471,543,234	820,683,476
b) with non- shceduled Banks				
-On current Accounts	-		-	
- On Deposits Accounts(including margine money)	-		-	
- On saving Accounts	-	-	-	-
5. Post office saving Accounts		-		-
TOTAL (A)		626,510,032		829,486,075

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 11- CURRENT ASSETS, LOANS, AND ADVANCES	(AMOUNT IN Rs.)			
	CURRENT YEAR		PREVIOUS YEAR	
B) LOANS, ADVANCES AND OTHER ASSETS				
1.LOANS & ADVANCES				
a) Staff	5,015,786		3,536,426	
b) other entities engaged in activities similar to that entity	358,287,007		339,653,112	
c) Other (Sponsored Projects Advances)	360,940,995	724,243,788	211,676,549	554,866,087
2.Advances and other amounts recoverable in cash or kind				
a) On capital account	-		-	
b) Prepayments	1,714,190		1,156,929	
c) Others	-	1,714,190	-	1,156,929
3. Income Accrued	-			
a) on investments from earmarked/endowment funds	1,551,325		1,551,325	
b) On investments (Sponsored Projects)	1,246,922		1,169,864	
c) On loans and advances	-		-	
d) Others	-	2,798,247	-	2,721,189
4. CLAIMS RECEIVABLE		-		-
TOTAL (B)		728,756,225		558,744,205
TOTAL (A+B)		1,355,266,258		1,388,230,280

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 12- INCOME FROM SALES/SERVICE	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1.INCOME FROM SALES		
a) Sale of Finished goods	-	-
b) Sale of Raw material	-	-
c)Sale of Scrap		
2. INCOME FROM SERVICES		
a) Labour and processing charges	-	-
b) Professional/ consultancy service	-	-
c) Agency commission and Brokerage	-	-
d) Maintenance Services (Eqipment / property)	-	-
e) Others (specify)	-	-
TOTAL	-	-

SCHEDULE 13- GRANTS/ SUBSIDIES	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. Central Government	689,000,000	464,880,000
2. Fund Transfer to ZO'S	-	-
3. State Government	-	-
4. Government agencies	-	-
5. Institutions/ welfare Bodies	-	-
6. International Organisations	-	-
7. Others (specify)	-	-
TOTAL	689,000,000	464,880,000

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

			(AMOUNT IN Rs.)	
SCHEDULE 14- FEES/ SUBSCRIPTIONS			**CURRENT YEAR**	**PREVIOUS YEAR**
1. Entrance fees			-	-
2. Annual Fees/ Subscriptions			-	-
3. Seminar/ program Fees			-	-
4. Consultancy Fees			-	-
5. Others			-	-
			-	-

SCHEDULE 15- INCOME FROM INVESTMENTS			(AMOUNT IN Rs.)	
	CURRENT YEAR	**PREVIOUS YEAR**	**CURRENT YEAR**	**PREVIOUS YEAR**
1. INTEREST				
A) ON GOVT. SECURITIES	-		-	
B) OTHER BONDS/ DEBENTURES	-	-	-	-
2. DIVIDENDS				
A) ON SHARES	-		-	
B) ON MUTUAL FUND SECURITIES	-	-	-	-
3. RENTS		-		-
4. OTHERS (SPECIFY)		-		-
TRANSFERRED TO EARMARKED/ ENDOWMENT FUNDS		-		-

SCHEDULE 16 - INCOME FROM ROYALTY, PUBLICATIONS etc.			(AMOUNT IN Rs.)	
			CURRENT YEAR	**PREVIOUS YEAR**
1. INCOME FROM ROYALTY			-	-
2. INCOME FROM PUBLICATIONS			230,631	656,140
3. OTHERS (specify)			-	-
TOTAL			**230,631**	**656,140**

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 17 - INTEREST EARNED	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. ON TERM DEPOSITS		
a) with scheduled Banks	467,917	2,544,977
b) with non scheduled Banks	-	-
c) with institution	-	-
d) others	-	-
2. ON SAVING ACCOUNTS	-	
a) with scheduled Banks	-	-
b) with non scheduled Banks	-	-
c) with institution	-	-
d) others	-	-
3. ON LOANS	-	
a) Employee/ staff - HBA	156,939	196,608
b) Others	-	-
4. INTEREST ON DEBTORS AND OTHERS RECEIVABLES	-	-
TOTAL	624,856	2,741,585

SCHEDULE 18- OTHER INCOME	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. PROFIT ON SALE/ DISPOSAL OF ASSETS		
a) Owned assets	-	-
b) Assets acquired out of grants, or received free of cost	-	-
2.EXPORT INCENTIVES REALIZED	-	-
3. FEES FOR MISCELLANEOUS SERVICES	-	900
4. MISCELLANEOUS INCOME	683,350	2,379,177
TOTAL	683,350	2,380,077

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 19- INCREASE/DECREASE IN STOCK OF FINISHED GOODS & WORK-IN-PROGERESS	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
A. CLOSING STOCK		
- Finished Goods	9,875,416	8,802,817
- Work in progress	-	-
B. Less:- OPENING STOCK	-	-
- Finished Goods	8,802,817	8,996,455
- Work in progress	-	-
NET INCREASE/ DECREASE (A-B)	1,072,600	(193,637)

SCHEDULE 20- ESTABLISHMENT EXPENSES	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. SALARIES & WAGES	298,713,243	282,325,675
2. ALLOWANCES AND BONUS	12,238,782	17,954,022
3. CONTRIBUTION TO PROVIDENT FUND	14,051,360	14,577,264
4. CONTRIBUTION TO OTHER FUND - GIS	132,486	132,522
5. STAFF WELFARE EXPENSES	2,781,945	3,049,921
6. EXPENSES ON EMPLOYEE RETIREMENT & TERMINAL BENEFIT	51,870,789	47,151,127
7. OTHERS- WELFARE FUND	16,315	15,235
TOTAL	379,804,920	365,205,766

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

SCHEDULE 21 - OTHER ADMINISTRATIVE EXPENSES			(AMOUNT IN Rs.)	
			CURRENT YEAR	PREVIOUS YEAR
ADVERTISEMENT AND PUBLICITY			1,810,182	2,107,092
AUDITORS REMUNERATION			-	106,742
CARTAGE AND CARIAGE INWARD			-	-
DISTRIBUTION EXPENSES			-	-
ELECTRICITY AND POWER			15,108,849	12,292,339
EXCISE DUTY			-	-
EXPENSES ON FEES			43,000	57,662
EXPENSES ON SEMINAR/WORKSHOP			6,441,599	5,496,051
FREIGHT AND FORWARDING EXPENSES			7,348	2,100
HOSPITALITY EXPENSES			8,609	43,860
INSURANCE			538,848	183,867
IRRECOVERABLE BALANCES WRITTEN OFF			-	-
LABOUR AND PROCESSING EXPENSES			-	-
OTHERS (specify)			9,926,587	10,118,127
PACKING CHARGES			-	-
POSTAGE, TELEPHONE AND COMMUNICATIONS			3,228,113	3,397,938
PRINTING AND STATIONARY			1,401,341	2,243,861
PROFESSIONAL CHARGES			561,059	487,185
PROVISION FOR BAD AND DOUBTFUL DEBTS			-	-
PURCHASES			11,195,575	7,397,501
RENT, RATES AND TAXES			7,799,277	4,567,286
REPAIR AND MAINTENANCE			16,839,580	28,688,787
SUBSCRIPTION EXPENSES			88,551	-
TRAVELLING AND CONVEYANCE EXPENSES			16,359,104	14,368,087
VEHICLE RUNNING AND MAINTENANCE			5,352,842	4,383,865
WATER CHARGES			2,223,418	2,287,206
TOTAL			98,933,882	98,229,555

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2014

	(AMOUNT IN Rs.)	
SCHEDULE 22- EXPENDITURE ON GRANTS, SUBSIDIES	CURRENT YEAR	PREVIOUS YEAR
GRANTS GIVEN TO INSTITUTIONS/ ORGANISATION	-	
SUBSIDIES GIVEN TO INSTITUTIONS/ ORGANISATION	-	
TOTAL	-	

	(AMOUNT IN Rs.)	
SCHEDULE 23- INTEREST	CURRENT YEAR	PREVIOUS YEAR
ON FIXED LOANS	-	-
ON OTHER LOANS (including bank charges)	19,548	17,822
OTHERS (specify)	-	-
TOTAL	19,548	17,822

	(AMOUNT IN Rs.)	
SCHEDULE 24- MONITORING EXPENSES	CURRENT YEAR	PREVIOUS YEAR
AIR QUILITY MONITORING EXPENSES	81,464,438	32,817,317
WATER QUILITY MONITORING EXPENSES	38,139,327	32,062
ENVIRONMENT PROTECTION AND MONITORING EXP.	66,046,508	10,605,938
TOTAL	185,650,273	43,455,317

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CENTRAL POLLUTION CONTROL BOARD, DELHI
RECEIPTS & PAYMENT ACCOUNT FOR THE YEAR ENDED 31.03.2014

(AMOUNT IN Rs.)

RECEIPTS	CURRENT YEAR	PREVIOUS YEAR	PAYMENTS	CURRENT YEAR	PREVIOUS YEAR
I. Opening Balance			I. Expenses		
a) Cash in hand	(219)	(219)	a) Establishment Expenses (corresponding to schedule 20)	337,178,365	365,205,766
b) Bank Balances	-	-	b) Administrative Expenses (corresponding to schedule 21 and 24)	275,353,480	141,684,872
i) In current accounts	335,833,683	365,371,802	c) Prior Period Exps	974,008	45,714,598
ii) In deposit accounts	13,306,559	89,294,474	II. Payments made against funds for various projects	-	-
iii) Savings accounts	471,543,234	-	Project Exps	88,814,374	59,863,294
II. Grants Received	-	-		-	-
a) From Government of India - Mains	689,000,000	464,880,000	III. Investments and deposits made		
b) From State Government	-	-	a) Out of Earmarked/Endowment funds	-	-
c) From Government of India - Projects	31,538,629	603,307,680	b) Out of Own Funds (Investments-Others)	-	-
d) Others	3,000,000	1,000,000			
			IV. Expenditure on Fixed Assets &Capital Work in progress		
			a) Purchase of Fixed Assets-Own fund	7,164,580	40,903,216
III. Income on Investments from			b) Purchase of Fixed Assets- Earmarked/Endowment funds	-	-
a) Earmarked/Endow. Funds	19,955,904	9,758,910			
b) Own Funds	-	-	V. Refund of surplus money/Loans		
			a) To the Government of India	52,913,671	116,492,708
IV. Interest Received	-	-	b) To the State Government	-	-
a) On Bank deposits	-	2,544,977	c) To other providers of funds	-	-
b) Loans. Advances etc.	-	196,608	d) To the Government of India - Mains	446,000	
			VI. Finance Charges (Interest & Bank charges Sch 23)	19,548	17,822
V. Other Income (Specify)					
a) Income from Royalty, Publications Etc.	284,531	656,140	VII. Other Payments (Specify)		
b) Other Income	839,755	2,380,077	a) Advances and other payments (Net) - Mains	236,568,121	-
c) Misc Income	-	-	b) Advances and other payments (Net) - Projects	151,250,984	29,679,466
VI. Amount Borrowed	-	-			
			VIII. Closing Balances		
VII. Any other receipts			a) Cash in hand	-	(219)
a) Other - Mains	201,673,068	60,596,455	b) Bank Balances	-	-
c) Sale of Fixed Assets	342,603	3,316	i) In current accounts	282,052,219	335,833,683
d)Advances and other payments (Net)-Mains	-	20,254,780	ii) In deposit accounts	38,011,098	13,306,559
			iii) In Savings account	296,571,299	471,543,234
Grand Total	1,767,317,747	1,620,245,000	Grand Total	1,767,317,747	1,620,245,000

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date

For Prakash Jain & Co.
Chartered Accountants
Firm Reg. No. 007405N

(K.C. Jain)
M.NO. 015438
Partner
Place: Delhi
Date: 30.01.2015

Prakash Jain & Co. New Delhi Firm Regn. No. 007405N Chartered Accountants

For Central Pollution Control Board

(Shashi Shekhar)
Chairman

(A.B. Akolkar)
Member Secretary

(Mahender Bansal)
Accounts Officer

(Mohan Kapur)
Assistant Accounts Officer

Schedule 'C'

CENTRAL POLLUTION CONTROL BOARD : DELHI - 110032

DEPOSITS RECEIVED FOR WORKS FROM OUTSIDE BODIES (OTHER SPONSORED PROJECTS) (2013-14)

(Amount in Rs.)

SL.NO.	NAME OF THE PROJECT	OPENING BALANCE	RECEIVED DURING THE YEAR						PAYMENT DURING THE YEAR					CLOSING BALANCE
			Grant Received	Grant- Others	Interest	Other Receipts	Adjusments	Total	Expenditure	Project Advance	Advances and other payment (Net)	Refund to MoEF	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9=4+5+6+7+8)	(10)	(11.)	(12)	(13)	(14=10+11+12+13)	(14=3+9-14)
1	AAQM UP (Agra) Project	-	-	-	-	-	-	-	-	-	-	-	-	-
2	DOD Project	54,916	-	-	-	-	-	-	2,845	-	-	-	2,845	52,071
3	DTS Project (Bangluru)	539,795	-	-	-	-	-	-	-	-	-	-	-	539,795
4	NGBRA Saltless Project (Lucknow)	49,679	-	-	-	-	-	-	550	-	-	-	550	49,129
5	NRCD - Project (Lucknow)	3,598	-	-	-	1,000	-	1,000	2,611	-	1,987	-	4,598	-
6	NGRBA PIAS Project (Kolkata)	845,674	-	3,800,000	-	6,560	-	3,806,560	3,576,623	-	-	-	3,576,623	1,075,611
7	NGRBA PIAS Project (Lucknow)	213,613	-	4,700,000	-	75,566	-	4,775,566	4,370,310	-	-	-	4,370,310	618,869
8	NGRBA PIAS (Delhi HO)	52,517,239	-	(8,500,000)	1,818,636	-	-	(6,681,364)	4,370,557	3,614,603	-	-	7,985,160	37,850,715
9	3 R & D Project	9,381,859	5,000,000	-	-	1,466,100	-	6,466,100	8,994,383	-	-	6,279,438	15,273,821	574,138
10	CAEA - Phase II Project	51,055	-	-	1,892	-	-	1,892	-	-	-	-	-	52,947
11	CPCB Clean Technology Project	5,104,866	-	-	-	-	-	-	601,897	-	-	-	601,897	4,502,969
12	Bank Guarantee Project	15,836,651	-	3,000,000	1,404,899	-	-	4,404,899	-	-	77,058	-	77,058	20,164,492
13	HWMD Dump Site Project	100,000,000	-	-	-	-	-	-	55,533	-	-	-	55,533	99,944,467
14	HWMD Waste of UCIL Project	1,315,224	-	-	-	122,693	-	122,693	380,136	-	-	1,057,781	1,437,917	-
15	PAMS NEERI Report on Bhopal Project	1,147,962	-	-	-	-	-	-	165	-	-	-	165	1,147,797
16	Lyphilization Fees Project	2,107,479	-	-	82,551	-	-	82,551	-	-	-	2,190,030	2,190,030	-
17	MP Board Project	8,000,000	-	-	-	-	-	-	-	-	-	8,000,000	8,000,000	-
18	VTT Finland Project	60,289	151,463	-	-	-	-	151,463	173,794	-	-	-	173,794	37,958
19	ENVIS-MOEF Project	10,294	1,203,566	-	-	-	-	1,203,566	391,573	500,000	-	-	891,573	322,287
20	Financial Assistance for Hazardous & Waste	14,304,152	-	-	-	2,101,878	-	2,101,878	11,125,658	-	-	-	11,125,658	5,280,372
21	IARI (MPRNL) Project	599,953	1,180,000	-	21,838	-	-	1,201,838	1,063,656	-	-	-	1,063,656	738,135
22	ICAQIS (CESS) Project	2,550,054	-	-	-	-	-	-	3,157	-	2,504,055	-	2,507,212	42,842
23	Indo-Norweign Project	3,093,002	4,953,600	-	-	-	-	4,953,600	3,365,450	-	262,178	-	3,627,628	4,418,974
24	IWIN Project	35,780	-	-	-	-	-	-	-	-	-	-	-	35,780
25	NRCD - Yamuna Project	38,481	-	-	-	-	-	-	(10,102)	-	-	48,583	38,481	-
26	NSDI (DST) Project	706,900	1,000,000	-	-	-	-	1,000,000	72,527	-	-	-	72,527	1,634,373
27	Development of Monitoring Van-Orissa Boar	95,180	-	-	-	-	-	-	-	-	-	-	-	95,180
28	Paryavaran Darashan Project	47,500,000	-	-	-	-	-	-	-	-	-	20,408,648	20,408,648	27,091,352
29	Strengthening of NAQM Project	12,159,000	-	-	-	-	-	-	-	-	-	-	-	12,159,000
30	UNEP (MALE) Project	2,718,798	-	-	-	38,500	-	38,500	28,420	-	-	-	28,420	2,728,878
31	UNI DO Project	6,844,296	-	-	253,557	-	-	253,557	-	-	-	-	-	7,097,853
32	Workshop on BMW Project	304,316	-	-	-	176,421	-	176,421	176,421	-	-	304,316	480,737	-
33	Bakarganj Nala Patna Project	3,191	-	-	129	-	-	129	15	-	-	-	15	3,305
34	Budhanala Ludhiyana NRCP Project	38,434,433	-	-	877,033	-	-	877,033	32,617,120	5,817,000	-	-	38,434,120	877,346
35	Critically Polluted Areas - Cess Project	5,030,685	-	-	177,814	600,000	-	777,814	5,602,673	-	-	-	5,602,673	205,826
36	NAQMP Cess Project	100,613,699	-	-	4,064,791	-	-	4,064,791	375	88,000,000	-	-	88,000,375	16,678,115
37	WQMS Cess Project	8,323,228	-	-	637,095	-	-	637,095	68,738	-	-	8,891,585	8,960,323	-
38	NNMS Cess Project	11,227,436	11,250,000	-	532,571	22,400,000	-	34,182,571	(11,935)	-	-	-	(11,935)	45,421,942
39	Baseline Servey of Industires Project	40,190,480	-	-	1,623,902	2,000,000	-	3,623,902	74,413	184,519	-	-	258,932	43,555,450
40	Upgradation of Lab Project	262,220,082	-	-	8,211,201	-	-	8,211,201	11,716,811	46,334,862	-	-	58,051,673	212,379,610
41	West Bengal Board Project	5,500,000	-	-	233,290	-	-	233,290	-	-	-	5,733,290	5,733,290	-
42	CPCB (HWMD) WASTE OF UCIL	-	6,800,000	-	14,705	-	-	6,814,705	-	6,800,000	-	-	6,800,000	14,705
	Total	759,733,339	31,538,629	3,000,000	19,955,904	28,988,718	-	83,483,251	88,814,374	151,250,984	2,845,278	52,913,671	295,824,307	547,392,283

Annexure - 1 to Schedule C

CENTRAL POLLUTION CONTROL BOARD : DELHI - 110032

Closing Balance of capital fund - Other Sponsored Projects: (2013-14)

(Amount in Rs.)

SL.NO.	NAME OF THE PROJECT	Balance at Bank	Interest Accrued	Advances	Total	Less: Sundry Creditors	Closing Balance of captial fund
(1)	(2)	(3)	(4)	(5)	(6=3+4+5)	(7)	(8=6-7)
1	AAQM UP (Agra) Project	-	-	6,000	6,000	-	6,000
2	DOD Project	52,071	-	198,294	250,365	480,000	(229,635)
3	DTS Project (Bangluru)	539,795	-	-	539,795	-	539,795
4	NGBRA Saltless Project (Lucknow)	49,129	-	(414,016)	(364,887)	-	(364,887)
5	NRCD - Project (Lucknow)	-	-	(16,079)	(16,079)	347,207	(363,286)
6	NGRBA PIAS Project (Kolkata)	1,075,611	-	5,516	1,081,127	-	1,081,127
7	NGRBA PIAS Project (Lucknow)	618,869	-	-	618,869	-	618,869
8	NGRBA PIAS (Delhi HO)	37,850,715	-	6,789,562	44,640,277	-	44,640,277
9	3 R & D Project	574,138	-	-	574,138	-	574,138
10	CAEA - Phase II Project	52,947	-	-	52,947	-	52,947
11	CPCB Clean Technology Project	4,502,969	-	-	4,502,969	-	4,502,969
12	Bank Guarantee Project	20,164,492	1,246,922	58,473	21,469,887	10,000,000	11,469,887
13	HWMD Dump Site Project	99,944,467	-	-	99,944,467	-	99,944,467
14	HWMD Waste of UCIL Project	-	-	124,652	124,652	-	124,652
15	PAMS NEERI Report on Bhopal Project	1,147,797	-	2,000,000	3,147,797	-	3,147,797
16	Lyphilization Fees Project	-	-	-	-	-	-
17	MP Board Project	-	-	-	-	-	-
18	VTT Finland Project	37,958	-	-	37,958	-	37,958
19	ENVIS-MOEF Project	322,287	-	90	322,377	-	322,377
20	Financial Assistance for Hazardous & Waste Management Project	5,280,372	-	-	5,280,372	-	5,280,372
21	IARI (MPRNL) Project	738,135	-	-	738,135	-	738,135
22	ICAQIS (CESS) Project	42,842	-	10,469,370	10,512,212	-	10,512,212
23	Indo-Norweign Project	4,418,974	-	-	4,418,974	-	4,418,974
24	IWIN Project	35,780	-	-	35,780	-	35,780
25	NRCD - Yamuna Project	-	-	-		-	-
26	NSDI (DST) Project	1,634,373	-	-	1,634,373	-	1,634,373
27	Development of Monitoring Van-Orissa Board Project	95,180	-	2,020,680	2,115,860	-	2,115,860
28	Paryavaran Darashan Project	27,091,352	-	142,500,000	169,591,352	-	169,591,352
29	Strengthening of NAQM Project	12,159,000	-	43,552,310	55,711,310	-	55,711,310
30	UNEP (MALE) Project	2,728,878	-	22,976	2,751,854	-	2,751,854
31	UNI DO Project	7,097,853	-	-	7,097,853	-	7,097,853
32	Workshop on BMW Project	-	-	415,263	415,263	-	415,263
33	Bakarganj Nala Patna Project	3,305	-	5,600,000	5,603,305	-	5,603,305
34	Budhanala Ludhiyana NRCP Project	877,346	-	5,817,000	6,694,346	-	6,694,346
35	Critically Polluted Areas - Cess Project	205,826	-	-	205,826	600,000	(394,174)
36	NAQMP Cess Project	16,678,115	-	88,000,000	104,678,115	-	104,678,115
37	WQMS Cess Project	-	-	-	-	-	-
38	NNMS Cess Project	45,421,942	-	91,605	45,513,547	22,400,000	23,113,547
39	Baseline Servey of Industires Project	43,555,450	-	184,519	43,739,969	2,000,000	41,739,969
40	Upgradation of Lab Project	212,379,610	-	46,714,780	259,094,390	-	259,094,390
41	West Bengal Board Project	-	-	-	-	-	-
42	CPCB (HWMD) WASTE OF UCIL	14,705	-	6,800,000	6,814,705	-	6,814,705
	Total	547,392,283	1,246,922	360,940,995	909,580,200	35,827,207	873,752,993

Prakash Jain & Co. New Delhi

SCHEDULES FORMING PART OF THE ACCOUNTS FOR THE YEAR ENDED 31st March 2014

SCHEDULE 25- SIGNIFICANT ACCOUNTING POLICIES

1. ACCOUNTING CONVENTION

The Financial Statements i.e., Balance Sheet, Income & Expenditure Account & Receipts and Payments Account are prepared on the basis of historical cost convention and on the basis of accrual method of Accounting unless stated otherwise. The Financial statements have been prepared as per 'Form of Financial Statement for the Central Autonomous Bodies' as per the directions of Ministry of Environment and Forest, Govt. of India vide their letter no.G25012/1/2010-CPW dated 10.02.10.as circulated by Controller General of Accounts, Ministry of Finance. The Financial Statement includes Financial Statement of Head Office Delhi and its six Zonal Offices located at Bangaluru, Bhopal, Kolkata, Lucknow, Shillong, and Vadodara and sponsored projects.

2. REVENUE RECONGNITION

2.1 Grants- in - Aid are accounted for on realization basis.
2.2 Interest on Bank Deposits is recognized on accrual basis.
2.3 Miscellaneous Receipts and other Incomes are recognized on receipts basis.

3. FIXED ASSETS

3.1 Fixed Assets are stated at cost of acquisition inclusive of freight inward, duties, taxes, incidental and other direct expenses related to acquisition.

3.2 Fixed Assets received by way of non-monetary grants, (other than towards the Corpus Fund), i.e., gifted assets are taken in the financial books at nominal value. The incidental expenses on such assets such as clearing & forwarding charges, duties & taxes and other incidental expenses are capitalized.

3.3. REGROUPING OF FIXED ASSETS

3.3.1 Laboratory Equipments & Scientific Equipments and other Project Equipments have been grouped under Plant, Machinery & Equipments.

4. DEPRECIATION

4.1. Depreciation during the year is provided on straight-line method as per rates given below. Lease hold land has been amortized over the lease period.

Category of Assets	Rates (in %)
Free Hold Land	0
Building	10
Plant , Machinery & Equipments	15
Vehicles	15
Furniture & Fixtures	10
Computers	60
Library Books	15

4.2 In respect of additions to / deduction from the fixed assets during the year, depreciation is considered on full-year basis.

5. FOREIGN CURRENCY TRANSACTION

Transaction denominated in foreign currency is accounted for at the exchange rate prevailing at the date of transaction.

6. INVENTORY VALUATION

Stores and Spares including Chemicals, Glassware, Consumables & other Inventories have been valued at cost as at the close of the year.

7. RETIREMENT BENEFITS

The Board's contribution to Contributory Provident Fund is charged to Income & Expenditure Account. The Board also provides Gratuity benefits to its employees. Liability towards Gratuity payable on death/retirement is accrued at the year-end on the basis of actuarial valuation as at year end.

The Board has got actuarial valuation of provision for Gratuity as on 31 Mar, 2013 and 31 Mar, 2014. The increase in amount of actuarial valuation of provision made as on 31 Mar, 2014, as compared to actuarial valuation as on 31 Mar, 2013 (Rs. 22,21,78,795/- less Rs. 20,29,15,313/-) of Rs. 1,92,63,482/- has been charged to Income & Expenditure Account.

Provision for accumulated Leave Encashment benefit to employees is accrued and computed on the basis of actuarial valuation as at year end. The increase in amount of actuarial valuation of provision made for Leave Encashment as on 31 Mar-2014 as compared to actuarial valuation as on 31 Mar, 2013 (Rs. 16,26,06,170/- Less Rs. 14,46,48,922/-) of `Rs. 1,79,57,248 /- has been charged to Income & Expenditure Account.

8. EARMARKED FUNDS – SPONSORED PROJECTS

8.1. The Funds Received & utilized for Sponsored Projects have been identified as Earmarked Funds. The funds are utilized towards the objectives of the specific Projects. Income on account of bank interest is added to the Sponsored Projects and not treated as income of the Board.

8.2. The sponsored Project " UCIL (SLP) Bhopal Project" has been commenced during the current financial year.

SCHEDULE 26 - CONTINGENT LIABLITIES AND NOTES ON ACCOUNTS

S NO	PARTICULARS	CURRENT YEAR (Amount in Rs.)	PREVIOUS YEAR (Amount in Rs.)
1	**CONTINGENT LIABLITIES**		
1.1	Claims against the Entity not acknowledged as debts	NIL	NIL
1.2	In respect of		
	- Bank Guarantees given by/on behalf of Entity	NIL	NIL
	- Letter of Credit opened by Bank on behalf of the Entity	2,89,50,000	1,19,25,285
	- Bills Discounted with Banks	NIL	NIL
1.3	Disputed Demands in respect of		
	- Income Tax	NIL	NIL
	- Sales Tax	NIL	NIL
	- Municipal Tax	NIL	NIL
1.4	In respect of claims from parties for non-execution of orders, but contested by the entity	NIL	NIL
1.5	In respect of Court cases And Arbitration	10,37,430	16,40,955
2.	**CAPITAL COMMITMENTS** Estimated value of contracts remaining to be executed on capital accounts and not provided for (net of advances)	NIL	NIL
3.	**LEASE OBLIGATIONS** Future obligations for rentals under finance lease arrangements for plant and machinery	NIL	NIL
4.	**CURRENT ASSETS, LOANS AND ADVANCES**		

In the opinion of the Management, the current assets, loans and advances have a value on realisation in the ordinary course, equal to at least the aggregate amount shown in the Balance Sheet.

Particulars	**Current Year (Rs. in lacs)**	**Previous Year (Rs. in lacs)**
Staff Advances	27.47	21.72
Outside Projects Advances	83.17	99.60
State Pollution Control Board's Advances	41.56	41.56
Publications Advances	55.62	49.48
Purchase & other Advances	22.60	22.55
Advances for Capital Commitment	0.00	0.00
Other Advances – UC Required	3253.99	3050.46
Misc Advances	14.35	0.00
Total (A)	**3498.78**	**3285.37**
Advances made by Zonal Offices **(B)**	134.37	134.13*
Project Advances **(C)**	3609.50	2128.50*
Grand Total (A+B+C)	**7242.63**	**5548.00**

* Figures not mentioned in the previous year's 'Notes to Accounts' inadvertently.

The Following credit balances are subject to confirmations:

Particulars	**Current Year (Rs. in lacs)**	**Previous Year (Rs. in lacs)**
Deposits (Work)	91.46	92.11
Earnest Money Deposit	29.59	26.40
Retention Money	0.73	0.73
Security Deposit	12.13	8.90
Others	16.33	15.56
Grand Total	**150.24**	**143.70**

5. TAXATION

In view of there being no taxable income under Income Tax Act 1961, no provision for Income tax has been considered necessary.

6. FOREIGN CURRENCY TRANSACTIONS

	CURRENT YEAR (Rs.)	PREVIOUS YEAR (Rs.)
6.1 Value of Imports Calculated on C.I.F Basis:		
--Purchase of finished Goods	NIL	NIL
--Raw Materials & Components (Including in transit)	NIL	NIL
--Capital Goods, Stores, Spares and Consumables	2,170,130	31,987,739
6.2 Expenditure in foreign currency:		
a) Travel	27,42,103	35,61,479
b) Remittances interest payment to Financial Institution/Banks in foreign Currency	NIL	NIL
c) Other expenditure:		
--Commission on Sales	NIL	NIL
--Legal and Professional Expenses	NIL	NIL
--Miscellaneous Expenses	NIL	NIL
6.3 Earnings:		
Value of Exports on FOB basis	NIL	NIL
6.4 Remuneration to Auditors:		
--As Auditors	1,06,742	1,04,785
--Taxation matters	NIL	NIL
--For Management services	NIL	NIL
--For certification	NIL	NIL
--Others	NIL	NIL

7. Corresponding figures for the previous year have been regrouped / rearranged, wherever necessary.

8.0 Fixed Assets Register

8.1 The Assets Registers have been maintained as per General Financial Rules (GFR) in respect of Laboratory Equipments, Instruments, Computers, Office Equipments and Furniture and Fixture on cost basis. However, the balance appears in the said registers may not tally with Financial Statement/Books of Accounts as depreciation is charged in the Financial Books of Accounts and no depreciation is charged in the fixed assets register as there is no column in fixed assets register for providing depreciation on fixed assets as per GFR.

8.2 The Physical Verification of assets of the board was carried out in the phased manner. However, the obsolete assets are to be disposed off / written off.

9.0 Outstanding Balances

9.1 The Balances under heading 'Deposit received for Works from Outside Bodies' & 'Amount due in Liability side' and 'Advances' in Assets side of the Balance Sheet are subject to reconciliation / confirmation. The old Balances appearing in advances / liabilities are in the process of Reconciliation, and the effect, if any, in the Books of Accounts will be given on reconciliation thereof.

9.2 There are cheques issued but not presented in bank amounting to Rs. 70,756/- which have become stale but not yet reversed in books of accounts. However, the Board is in the process of adjustment/ settlement of these transactions.

10. There are unspent balances in Sponsored Projects, which are outstanding for a long time for want of necessary instructions from Sponsors

11. Contingent Liablity for Pension of CPCB employees:

CPCB employees recruited before 1.1.2004 are covered under Contributory Provident Fund (CPF) scheme. However the employees' union of CPCB is demanding coverage under Pension (Old) scheme and a court case is under progress in this regard. Contingent liability that may arise in the event of court's verdict goes in favour of employees' union demand, has neither been shown and nor been ascertained.

12. Staff advances include Rs. 223943/- (Net) which is due from CPCB employees who have either left the organisation or died. Thus the sum is irrecoverable and need to be written off.

13. Current Liabilities include Rs. 5,29,718/- and Rs. 7,55,069/- under the head Misc Deposits- Stale Cheques and sundry Account respectively. Details are not available for the above two accounts and efforts are being made to reconcile these figures

14. During the year, out of the total expenditure of Rs. 8,88,14,374/- incurred in sponsored project, Rs.1,21,35,071 has been incurred on procurement of fixed assets.

15. Earmarked Funds- Sponsored Projects

During the year 42 Nos. of projects were carried out by Central Pollution Control Board as per details given in schedule 'C' (attached).

16. Schedules 1 to 26 are annexed to and form integral parts of the Balance Sheet as at 31st March 2014 and the Income and Expenditure Account for the year ended on that date.

For Prakash Jain & Co.
Firm Reg. No. 007405N
Chartered Accountants

(K.C. Jain)
Partner
M.No. 015438

Prakash Jain & Co.
New Delhi
Firm Regn. No.
Chartered

Place: Delhi
Date: 30.01.2015

For Central Pollution Control Board

(Shashi Shekhar)
Chairman

(A.B. Akolkar)
Member Secretary

(Mahender Bansal)
Accounts Officer

(Mohan Kapur)
Assistant Accounts Officer

CHAPTER XIII

ANNUAL ACTION PLAN FOR THE YEAR 2013-14

The Central Pollution Control Board (CPCB) is coordinating with the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) on execution of nation-wide programmes relating to abatement of pollution. The activities mandated to CPCB are diversified in nature which includes; monitoring of ambient environment, formulation of standards and guidelines and providing implementation status reports to the Ministry of Environment and Forests (MoEF) on rules framed under the Environment (Protection) Act, 1986.

The Annual Action Plan (Work Plan) of CPCB for 2013-14 has laid emphasis on strengthening of environmental monitoring network, carrying out random checks of industries for compliance verification, review of existing standards and development of new standards and inventorisation of wastes. Capacity development of SPCBs through trainings and organizing/participation in mass awareness programmes will be the continued activity. Specific attention will be given on strengthening of existing Zonal Offices and opening of two new Zonal Offices, i.e. one at Chennai and another at Chandigarh.

13.1 ACHIEVEMENTS OF 2012-13

13.1.1 Assessment of Pollution:

- Installed ten (10) real-time water quality monitoring stations (RTWQMS) on river Ganga and Yamuna.
- Carried out water quality monitoring at 2500 stations covering 445 rivers, 154 lakes, 12 tanks, 78 ponds, 41 sea water, 45 drains, 10 water treatment plants and 807 wells.
- Carried out ambient air quality monitoring (AAQM) at 545 stations covering 225 cities/towns in 26 States & 5 Union Territories.
- Operation & Maintenance of 35 National Ambient Noise Monitoring Network (NANMN) stations located in 07 cities (Delhi, Mumbai, Hyderabad, Lucknow, Kolkata, Bangalore, Chennai).
- Operating 15 CAAQMS in 4 cities, 12 CAAQMS are being operated under operation & maintenance contract and 3 CAAQMS are being operated by CPCB. Data of all fifteen CAAQMS is being uploaded in CPCB's website on regular basis.
- Ambient Dioxin/Furan monitoring has been undertaken during Pre-Deepawali, Deepawali & Post-Deepawali at two locations in Delhi.

- Prepared status report of water quality in India-2011.
- Carried pre-monsoon and post-monsoon monitoring and sampling of 93 ground water and surface water in NCR of Delhi.

13.1.2 Industrial Pollution Control:

- Emission standards have been developed for cement industry (NOx & SO_2 and load-based for particulate matter), emission standard for petrol and kerosene DG sets, emission standard for DG sets (upto 800 KW) and effluent & emission standards for Dye and Dye intermediate industry. (These standards have been forwarded to MoEF for Notification).
- Emission standard for CNG/LPG based Genset upto 400 cc and upto 800 kw capacity developed. (This standard has been approved in Board Meeting held on 22nd March, 2013).

13.1.3 Waste Management:

- Trial run for disposal of union carbide waste is under progress at Pithampur (MP).
- CPCB is preparing Guidelines for management and handling of Phosphorus waste.
- The study of Life Cycle Assessment of plastic products completed and report prepared.
- Carried out inspections of TSDFs, CBMWTFs and SLF.
- Completed study on quantification and characterization of plastic waste in 60 major cities in India. Report finalised.
- Provided and presented the status report on implementation of PWM Rules, 2011 to Hon'ble Supreme Court in SLP (C) 16308/2007.
- The report on performance study of Plasma Pyrolysis Technology for disposal of plastic waste is under printing.

13.1.4 Training, Mass Awareness and Environment Data Bank:

- Implementation of Raj-Bhasha (Hindi) in CPCB and organizing Hindi Diwas, Workshop and Training Programmes for CPCB officials.
- Published twenty (20) technical and scientific reports and mass awareness material for distribution during Kumbh Mela, 2013 held at Allahabad.
- Conducted 19 national training programmes on various environmental pollution and prevention areas. These programmes were attended by staff of CPCB and SPCBs.

13.2 THRUST AREAS FOR 2013-14

The current financial year i.e. 2013-14 is the 2nd year of 12th Five Year Plan (FYP). An Expenditure Finance Committee Memo of CPCB for 12th FYP has been submitted to MoEF detailing year-wise activities. During 2013-14, few new activities will be undertaken, however, the schemes/activities started during 2012-13 will be completed during 2013-14. The emphasis will be given on the following projects/ schemes during 2013-14.

13.3 PROJECTS/SCHEMES PROPOSED UNDER ANNUAL ACTION PLAN OF CPCB:

- Water quality monitoring will be carried out at 2500 stations;
- Intensive monitoring of 150 polluted river stretches and continuing inter-state water quality monitoring of rivers at 86 locations in 16 States;
- Undertaking toxicity evaluation in the relevant critically polluted areas out of the 43 identified critically polluted industrial clusters;
- Ambient air quality will be carried out at 650 locations.
- Setting up of 35 noise monitoring stations in metros and in State capitals.
- Central laboratories at Head Quarter and four zonal laboratories will be strengthened to have National Accreditation Board for Testing and Calibration Laboratory (NABL) accreditation, certification under OSHA 18001 and recognition as Environmental Laboratories under EPA.
- Laboratories will be equipped to analyse 48 parameters relating to liquid effluents, and 40 parameters with respect to gaseous emissions and ambient air.
- Standard development will consider best available cleaner technological options and be in line with National Environment Policy (NEP-2006). Standards will also be evolved for waste recycling industries and such wastes shall include; Hazardous waste, E-waste, Batteries and others.
- Monitoring of 43 critically polluted industrial clusters as well as taking stock of situation on implementation of action plans by the state agencies. CPCB will also interact with SPCBs and PCCs for carrying out health-based surveys in the critically polluted areas involving third party agency for monitoring through contribution from industries on polluter pays principle.
- Formulation of proposals for adoption of cleaner production technologies and technologies aiming for zero waste (Zero Liquid Discharge) and pollutant removal.
- Emerging and dynamic environmental challenges have widened the scope of training areas which would cover issues relating to; climate change, waste recycling/re-use, standards and assimilative capacities of recipient environment, new production technologies, clean and green technologies, Innovative Technologies in waste management, health-based standards and others.
- Organizing mass awareness will be the continued/on-going activity.

- Emphasis will be laid on inventorisation of wastes including their quantification characterization (hazardous waste, bio-medical, plastics, electronic, batteries, and municipal solid wastes)
- To reduce the gap between waste generation and treatment, CPCB with MoEF and other stake holders, will assess the requirement of common waste management facilities.
- Remediation and mitigation plans for contaminated hazardous waste sites and rehabilitation of existing MSW dumpsites will be executed through Ministry of Urban Development and urban local bodies.
- Total recycling/ re-use of waste will be enforced and will include harnessing energy recovery from high calorific value waste in cement kiln and of Steel mills/Power Plants furnaces.

13.4 SPONSORED PROJECTS:

A Projects Sanctioned Under Cess Fund (By MoEF)

1. Establishing Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in Critically Polluted Areas".
2. Expanding National Ambient Noise Monitoring Network from 35 to 70 stations in 2012-13.
3. Establishing Real- time water quality monitoring stations (RTWQMS) on river Ganga.
4. Co-processing of hazardous and other wastes in cement plants, iron and steel industries and power plants.

B Projects under NGRBA:

1. Implementation of schemes/activities under NGRBA programme.
2. Elimination of Escherichia coli and other faecal coliform bacteria through bacteriophages from river Ganga and tributaries under NGRBA.
3. In-situ bioremediation for sewage treatment (Budha Nala, Ludhiana)

3.5 BUDGET ALLOCATION FOR 2013-14

3.5.1 Project Head-wise Budget Allocation for 2013-14:

The allocation made against each **Project Head** is summarized as under:

Project Heads	Title of the Project Head	Total Allocation (₹ in Crores)	1st installment (₹ in Crores)
I	Pollution Assessment (Survey and Monitoring)	22.00	5.50
II	Scientific and Technical Activities and R&D	5.00	1.25

Project Heads	Title of the Project Head	Total Allocation (₹ in Crores)	1st installment (₹ in Crores)
III	Industrial Pollution Control (standards, enforcements and technologies):		
	Standard Development	5.00	1.25
	Enforcement	16.00	4.00
	Technology	1.00	0.25
IV	Training and Awareness:		
	Training Programmes	1.00	0.25
	PR, Mass Awareness Programmes & Hindi	1.00	0.25
	Library	0.50	0.125
V	Information (Database) Management	1.00	0.25
VI	Waste Management and Urban Pollution Control (Plastic Waste, Hazardous Waste, Municipal Solid Waste, Bio-medical waste, E-waste & Vehicular Pollution)	5.22	1.305
	Total	**57.72**	**14.43**

CHAPTER XIV

OTHER IMPORTANT ACTIVITIES DEALT BY CENTRAL POLLUTION CONTROL BOARD

14.1 HAZARDOUS WASTE MANAGEMENT

Treatment, Storage and Disposal Facilities (TSDFs):

TSDFs provide for disposal of HW in environmentally sound and techno-economical viable manner. Common TSDFs are facilities used by various units/industries for treatment, storage and disposal of their hazardous wastes on charge basis. These are useful for small and medium scale hazardous waste generating industries that cannot establish their own TSDFs. These common TSDFs are generally expected to have facilities such as authorized vehicle for transportation of hazardous wastes from industries/units, weighing bridge, laboratory facilities (for finger printing) of hazardous wastes to decide their storage and disposal pathway, hazardous waste storage facilities, waste treatment/stabilization facilities, etc. The common TSDFs may have only secured landfill facilities or both secured landfill and incineration facilities. The latter are called "Integrated common TSDFs."

The generators have the option of recycling/reprocessing/co-processing/utilization of hazardous waste prior to ultimate option of disposal at secure land fill facility or destruction in incinerator. The generator can opt to dispose their waste either at captive or common disposal facilities. There are 38 common hazardous waste treatment, storage and disposal facilities (TSDFs) in the country.

There are 17 integrated TSDFs having both incineration and secured land fill facilities, 13 TSDFs having secured landfill facilities only and 08 facilities having only common incineration facilities in the country.

Table : State-wise availability of Integrated Treatment, Storage & Disposal Facilities (TSDFs):

Sl. No.	Name of the State/UT	Integrated TSDFs	Exclusive Common Incinerators	TSDFs with only SLFs
1.	Andaman & Nicobar Islands	-	-	-
2.	Andhra Pradesh	2	-	-
3.	Arunachal Pradesh	-	-	-
4.	Assam	-	-	-
5.	Bihar	-	-	-

Sl. No.	Name of the State/UT	Integrated TSDFs	Exclusive Common Incinerators	TSDFs with only SLFs
6.	Chandigarh	-	-	-
7.	Chhattisgarh	-	-	-
8.	Daman, Diu, Dadra & Nagar Haveli	1	-	-
9.	Delhi	-	-	-
10.	Goa	-	-	-
11.	Gujarat	4	1	4
12.	Haryana	1	-	-
13.	Himachal Pradesh	-	-	1
14.	Jammu & Kashmir	-	-	-
15.	Jharkhand	-	-	-
16.	Karnataka	-	5	1
17.	Kerala	-	-	1
18.	Lakshdweep	-	-	-
19.	Madhya Pradesh	1	-	-
20.	Maharashtra	3	-	1
21.	Manipur	-	-	-
22.	Meghalaya	-	-	-
23.	Mizoram	-	-	-
24.	Nagaland	-	-	-
25.	Orissa	-	-	1
26.	Pondicherry	-	-	-
27.	Punjab	-	-	1
28.	Rajasthan	-	1	2
29.	Sikkim	-	-	-
30.	Tamilnadu	1	-	-
31.	Tripura	-	-	-
32.	Uttar Pradesh	2	1	1
33.	Uttarakhand	1	-	-
34.	West Bengal	1	-	-
	Total	**17**	**8**	**13**

The States where there are no TSDFs have limited or inadequate options for disposal of Hazardous waste due to inadequate captive facilities, hindrances in interstate movement and permissions. The figures indicate that the existing TSDFs have a cumulative capacity of about 32 million Metric tonnes for secure landfill of hazardous waste and about 0.18 million tonnes/annum for incinerable hazardous waste.

There is acute problem of disposal in the States generating hazardous waste but not having TSDFs; such States/UTs needing common TSDFs on priority are Chhattisgarh, Jharkhand, J&K, Goa, Assam, Delhi, and Puducherry. However, there is adequate capacity for recycling/reprocessing of the hazardous waste listed in Schedule-IV of HWM Rules including used lead acid batteries, used oil and waste oil.

The approximate quantity of hazardous waste received / disposed by TSDFs since their commissioning and quantity received during the financial year 2012- 2013 are given below;

1	Quantity of Land-fillable waste disposed (cumulative) in all TSDFs in the country as on 31.03.13 in MT	9194497
2	Quantity of Incinerable hazardous waste disposed (cumulative) as on 31.03.13 (MT)	602055
3	Quantity of Land-fillable waste disposed during 1/4/2012 to 31/3/2013 (MT) (About 57% of the land-fillable HW generated)	1997733
4	Quantity of Incinerable hazardous waste disposed during 1/4/2012 to 31/3/2013 (MT)	92954

Utilization of hazardous Waste:

Rule 11 of the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008, stipulates that "The utilization of hazardous wastes as a supplementary resource or for energy recovery, or after processing shall be carried out by the units only after obtaining approval from the Central Pollution Control Board". Accordingly, CPCB has been evaluating various proposals received to encourage utilization of hazardous wastes.

Based on the trial utilization studies/visits conducted through Zonal Offices, CPCB has granted approval to about 40 units for utilization of hazardous waste like Spent carbon, Used anode butt, Spent resin, Ethylene glycol residue, ETP Sludge, Sulphur Sludge, Spent Alumina catalyst, spent chromic acid, Spent pickling acid containing hydrochloric acid, Waste/Spent fixer of X-rays/ photography, spent acid containing molybdenum compound, Tungsten bearing material (insert tips) and Spent catalyst-containing precious metals.

Apart from these, utilization of HW for co-processing in cement kilns has shown increasing trend over the past 3 years.

Protocols, developed by CPCB for environmentally sound utilization of some of the hazardous wastes,are given below;

S.No	Hazardous Waste to be utilized as Raw Material	Guidelines for Environmentally Sound Utilization of Hazardous Waste
1.	Spent Solvents	Install suitable venting system with flame arrestor for evacuating vapours during loading in the receiver/ storage tank. Install flame proof electrical fittings. Fire safety audit of the facility shall be carried out Minimum degree of manual handling of solvents shall be ensured. The residue generated during the recovery of solvent from spent solvent shall be sent to TSDF In case the solvent to be recovered is having boiling point of 100^{0}C and above, the unit may use water as cooling medium for condenser whereas for solvent with low boiling point (i.e. <100^{0}C), the unit shall install secondary condenser with chilled water/ brine as cooling medium. Install VOC emission control system at condenser outlet. The Spent solvent shall be stored under covered shed with proper slope and collection pit All personnel involved in the plant operation shall wear proper personal protective equipment such as masks, safety gloves, goggles, safety shoes etc. All the discarded/used drums/barrels are either sent back to the unit from where the material is procured or to the facility permitted by SPCB&CPCB for cleaning/washing of used drums/barrels.
2.	Used Anode Butts	Install shot blasting equipment or other similar equipment along with air pollution control system for chipping off the outer surface of the used anode butt. The residue generated during the shot blasting operation and flue-gas dust collected from air pollution control devices shall be sent to the TSDF. No cutting/breaking of used anode butt shall be carried out prior to shot blasting. Install suitable air pollution control system for control of fugitive dust form crushing and mixing operations.

S.No	Hazardous Waste to be utilized as Raw Material	Guidelines for Environmentally Sound Utilization of Hazardous Waste
		25 mm of outer layer of used anode butt shall be removed during shot blasting. The percentage mix of cleaned used anode butt in the product shall not exceed 50%. To maintain proper ventilation in the work zone of loading/unloading of used anode butt and shot blasting machine. All personnel in such work zone shall wear proper personal protective equipment such as masks, safety gloves, goggles, safety shoes etc. Install mechanical system for loading/unloading and feeding of used anode butt to shot blasting machine so that minimal manual handling is achieved.
3.	Cleaning of Contaminated Drums/ Containers	The units involved in cleaning of contaminated drums/ containers/ barrels should have the following minimum requirements; Handling and Storage: Separate storage area for both contaminated containers and cleaned containers. The contaminated containers should be kept under shed. There should be proper slope and spillage collection pit. The manifest system and logbook should be maintained. Labeling should be done on all contaminated drums indicating source and date of receipt and type of drum Prior to cleaning, the left-over or residual material in the drums should be transferred into a separate container for safe storage and disposal at TSDF. The drums for cleaning to be permitted based on type of constituents stored in it. No cleaning shall be permitted in case of highly toxic chemicals/ pesticides. Such containers shall be sent to TSDFs. Cleaning Procedure: All the drums should be cleaned with warm caustic solution up to 2% concentration of detergent. There should be two stage cleaning i.e. caustic / surfactants (detergent) cleaning followed by fresh water cleaning. Provide parapet wall along the container storage and washing area. The number of nozzles in 1 HP pump shall not exceed 3.

S.No	Hazardous Waste to be utilized as Raw Material	Guidelines for Environmentally Sound Utilization of Hazardous Waste
		The nozzles should have multiple jets to ensure that water jets hit whole inner surface of the containers. There should be separate area with provision of hose pipe with spray nozzle for washing outer surface of the containers. Effluent Treatment: The effluent generated should be treated by coagulation, flocculation and clarifier followed by evaporation unit to achieve zero discharge. Incase of availability of CETP, the unit may become members of the same and send its effluent for final treatment and disposal. Flow through evaporator should be regulated based on heating capacity of the evaporator. Water flow meter should be installed at the inlet to evaporator and at the inlet to ETP. The vent of vacuum pump should be elevated at least upto 2 mtr above the roof level Labelling of Cleaned drums for re-use: The labels on the washed containers for re-use should be removed (preferable with a paint) and the cleaned containers should be labeled with prominent indelible text "Drum Cleaned by : M/s_______; Date:_______" "For industrial use only NOT for storing any food material" The above is not applicable in case the cleaned drums are shredded and re-cycled.

Guidelines for Management & Handling of Phosphogypsum from Phosphoric Acid Plants

Draft Revised "Guidelines on Management & Handling of Phosphogypsum Generated from Phosphoric Acid Plants" were finalized and placed on CPCB website and also circulated to all the expert committee members and other stakeholders for their views & comments. These guidelines are under finalization.

Trial Incineration of Union Carbide Waste, Bhopal

While hearing the matter for trial incineration of Union Carbide waste at TSDF, Pithampur on 04/03/2013, the Hon'ble Supreme Court of India in Special Leave to Appeal (Civil) No(s).9874/2012; Union of India Vs. Alok Pratap Singh, directed

Central Government to conduct trail incineration of Pesticide waste from M/s Hindustan Insecticides Limited, Kochi at incinerator located at TSDF, Pithampur, MP. Subsequently, the central government had directed CPCB to execute the said order. Accordingly, CPCB had planned and executed the activities of trial incineration HIL waste viz. sampling, characterization, collection, packaging, transportation, and trial incineration.

About 10 tons of hazardous waste collected from M/s. Hindustan Insecticides Limited, Cochin (Kerala) consisted of wastes available at the premises which included Sludge from Chemical Tank, Process Incinerable Waste, Contaminated Packing materials, Sludge from Captive Secured Landfill and Contaminated Floor Sweeping from storage/process areas. The said 10 tons of hazardous waste collected was packed, labelled and loaded in two trucks at M/s. Hindustan Insecticides Limited, Cochin (Kerala) between June 07-13, 2013 under the supervision of Central Pollution Control Board. The two trucks left Kochi on 13/6/2013 and reached the incinerator facility of TSDF Pithampur, Dist. Dhar (M.P.) on 16/6/2013. State Government of Kerala, Karnataka, Maharashtra and Madhya Pradesh provided police security/ escort during inter-state transportation of the HIL waste from Kochi to Pithampur.

In presence of joint team comprising of officials from CPCB and MPPCB, the operator of the incinerator at TSDF, Pithampur started firing the incinerator with diesel on 23/06/2013 and after achieving desired temperatures in kiln and secondary combustion chamber and stabilizing the combustion, trial incineration of hazardous waste from M/s. Hindustan Insecticides Limited, Cochin (Kerala) started at 10 AM on 25/6/2013 and was completed by 7 AM on 30/6/2013.During the trial incineration, CPCB monitored the operational parameters of the incinerator and also conducted stack emission monitoring in presence of officials from Madhya Pradesh Pollution Control Board. The trial incineration was conducted successfully and the report placed before Hon'ble Supreme Court. The matter is being heard by Hon'ble Supreme Court.

Remediation of Contaminated Sites

There are several contaminated dump sites in various parts of India due to improper disposal or spillages of hazardous wastes / chemicals / untreated effluent from industrial operations, which resulted in contamination of soil and ground/surface water thereby posing health and environmental risks. Most of these sites may have been polluted when there was no regulation in the country for safe disposal of hazardous wastes. In some instances, industries responsible for contamination have been either closed down or the cost of remediation is beyond the capacity of the polluter, thus the sites remains a threat to the environment. Some of these sites might have been created due to illegal and clandestine ways of dumping and disposal of industrial waste. In the past, SPCBs have identified 76 contaminated hazardous waste dumpsites in 30 locations in the country. A recent study on inventory of contaminated sites under CBIPM Project of MoEF, indicate that there are around 400 probably contaminated sites, which require further investigations to ascertain if the site can be notified as contaminated.

The people (receptors) living in the vicinity of these contaminated sites are continued to get exposed to high health risks due to non-remediation of these sites. Remediation of the sites is essential to minimize such environment and health risks. However, there is limited experience in the country since very few remediation works have been implemented in the country.

Realizing the need for remediation of some of these high risk contaminated areas to safe guard the health of affected residents in large public interest, Ministry of Environment & Forest, Govt. of India has initiated a project to remediate 12 such priority sites under the National Clean Energy Fund (NCEF) where CPCBis the executing agency for the project.

Objectives of NCEF Project

The NCEF project is envisaged in two phases, i.e. preparation of detailed project report (DPR) in phase-I followed by providing consultancy services for environmentally sound remediation of hazardous waste contaminated sites in the country. In phase-I, a detailed project report shall be prepared based on site assessment studies along with a technical document for implementing the approved site specific remedial plan and in phase-II, the consultant shall assess and monitor the remediation works so as to ensure that works are done as per the technical specifications and standards set for remediation. The objectives are to be achieved in following steps;

Phase-I

(i) Assess the nature and extent of contaminants in surface/sub-surface, ground water and soils in and around the contaminated site;
(ii) Conduct detailed site assessment including risk assessment studies;
(iii) Prepare detailed project report along with technical and engineering designs for the approved remediation plan

Phase-II

(iv) Execution of the remediation work on hazardous waste contaminated areas; and
(v) Validation of remediation works and preparation of post-remediation monitoring plan.

The remediation objectives significantly vary from site to site, depending on the nature and characteristics of the pollutants, the level of risk, the extent of damage to soil and water at the site, the intended future land use, the feasible technologies for remediation and the cost of remediation. It is envisaged that site specific target levels for remediation may be prescribed based on the set remediation objectives. Out of 12 sites, work on the following 8 sites has been initiated by CPCB;

i. Eloor-Edyar area, Cochin, Kerala
ii. Ranipet Chromium Contaminated area, Tamilnadu
iii. Ratlam Industrial area, Ratlam, Madhya Pradesh
iv. Talcher Chromium contaminated area, Talcher, Odisha
v. Gunjam Mercury contaminated area, Gunjam Odisha
vi. Rania, Kanpur Dehat, Uttar Pradesh
vii. POPs contaminated area, Lucknow, Uttar Pradesh
viii. Nibra Village, Howrah, West Bengal

Expected outcomes

The benefits of remediating these hazardous waste contaminated areas will be mainly associated with a reduction in air, water and soil pollution and hence overall improvement in human health and the environment. The aforesaid project for remediation of contaminated sites would also results in a direct economic benefit in re-discovering contaminated land in terms of real estate price stabilization (Increase supply of saleable/leasable land). Although in some cases, the proposed project may not necessarily bring direct economic benefits; it will generate long term environmental and social benefits.

Table : Details of Contaminated areas for which work has been initiated during 2013-2014

Sl. No.	Location of the Site	Name of the Polluter	Number of Sites	Product	Type of Waste Generated	Quantity/Area of the Waste/ Contamination	Primary Contaminant
			KERALA				
1	Eloor – Edayar, Cochin	Hindustan Insecticides Ltd., Fertilizers and Chemicals Travancore Ltd., Merchem Ltd., Indian Rare Earths Ltd., BinaniZinc	4	DDT, Endosulfan, Dicofol, thiozoles, sulphamides, Zinc ingots	Jarosite, POPs	200000 (Kuzhikandomthodu), 206200 (Ammenthuruth-Karipadam), 30000 (Edayattuchal) & 15500 (Chakkarchal)	POPs, heavy metals unit of the waste
			MADHYA PRADESH				
2	Ratlam	Jayant Vitamins, Sajjan Chemicals & Investments Pvt. Ltd.	4	Vitamin C & Sorbitol H-Acid & G-Acid	ETP sludge/ Nickle Oxide; Iron Sludge/ Gypsum sludge/ Sodium Sulphate/ Incinerated ash	30 MT of waste 20906 MT/1166 MT/1410 MT of waste at 3 locations	Inorganic salts

Sl. No.	Location of the Site	Name of the Polluter	Number of Sites	Product	Type of Waste Generated	Quantity/Area of the Waste/ Contamination	Primary Contaminant
ODISHA							
3	Ganjam	Jayashree Chemicals	3	Alkali, Chlorine	Brine Sludge, Mercury waste	5000 MT/33000 MT/18000 MT at three locations	Mercury
4	Talcher	Orichem Ltd. (Closed)	1	Sodium Dichromate	Leached Residue	60000 tonnes of waste	Chromium
TAMILNADU							
5	Ranipet	Tamilnadu Chromates & Chemicals Ltd.	1	Sodium Dichromate, Basic chrome sulphate	Chromium residue	7.41 acres of contaminated site, 2-4 m height. Chrome bearing waste. Apprx. 2.2 lakh tones of waste.	Chromium
UTTAR PRADESH							
6	Lucknow	India Pesticides Ltd.	1	Lindane	HCH (Hexachlorocyclo hexane) muck waste containing pesticides.	-	Hexachlorocyclo hexane
7	Khanpur Village, Kanpur Dehat	Cerulean Chemicals, Warsi Chemicals, Chandani Chemicals, Amoliya Textiles, Hilger Chemicals (All units closed and dismantled long back).	1	-	Mostly BCS (Basic Chrome Sulphate) waste containing chromium (VI).	Area 2 sq. km. Private land. Apprx. 45000 tonnes of waste.	Chromium
WEST BENGAL							
8	Village Nibra, Dist. Howrah	Not Known	1	-	Bichromate manufacturing industry waste	4440 tonnes of waste	Chromium

Biomedical Waste Management

The Bio-medical Waste (Management & Handling) Rules, 1998 and amendments thereof (hereafter referred as BMW Rules) were notified under the Environment (Protection) Act, 1986 by the Ministry of Environment & Forests (MoEF) in the year 1998 and further amendments were made in the year 2000 and 2003. As per the said Rules, State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) in the respective States/UTs and Director General Armed Forces Medical Services (DGAFMS) in respect of the Health Care Establishments (HCEs) under the jurisdiction of the Ministry of Defence have been notified as the ‘prescribed authority’ for overall enforcement of the said Rules. As per Rule 10 of the BMW Rules, all the SPCBs and PCCs as well as DGAFMS are required to submit annual report information in a compiled form to the Central Pollution Control Board (CPCB), for the preceding year by 31st March of every year. CPCB is also regularly pursuing with the SPCBs/PCCs and DGAFMS for effective implementation of the BMW Rules.

Bio-medical Waste Management Scenario in the Country:

Based on the annual report information received for the year 2012 from the SPCBs & PCCs (except Chhattisgarh & Kerala SPCBs) and DGAFMS, the bio-medical waste management scenario in the Country is as given below:

- No. of healthcare Facilities (HCFs) : 1,59,838
- No. of beds : 16,12,600
- No. of Common Bio-medical Waste Treatment Facilities (CBWTFs) : **190* + 29****
- No. of HCFs using CBWTFs : 1,21,279
- No. of HCFs having treatment & disposal facilities : 21,870
- No. of HCFs having applied for authorization : 1,02,086
- No. of HCFs granted authorization : 98,074
- Total no. of on-site/captive treatment equipment installed by the HCFs
    - No. of Incinerators : 664
    - No. of Autoclaves : 4,158
    - No. of Microwaves : 186
    - No. of Hydroclaves : 21
    - No. of Shredders : 6,477
- Total no. of treatment equipment installed by the CBWTFs:
    - No. of Incinerators : 194
    - No. of Autoclaves :157
    - No. of Microwaves : 05
    - No. of Hydroclave : 02
    - No. of Shredders : 163
- Quantity of bio-medical waste generated in Tons/day : 416.0
- Quantity of bio-medical waste treated in Tons /day : 332.5
- No. of HCFs violated BMW Rules : 12,990
- No. of Show-cause notices/Directions issued to defaulter HCFs : 11,583

Note:

*(i) * CBWTFs in operation and ** CBWTFs under installation*

(ii) As Annual Report information for the year 2012 has not been submitted by States of Chhattisgarh & Kerala, the information submitted by the Chhattisgarh and Kerala SPCBs for the year 2011 is considered and same is included.

Status of no. of BMW Incinerators:

Based on the annual report information received from the SPCBs, PCCs and DGAFMS, the state-wise number of captive incinerators operated by the HCFs as well as DGAFMS and state-wise number of CBWTFs in operation as well as under construction are given in the Tables below;

Table : State-wise status of captive Incinerators installed by the HCFs as well as DGAFMS

Sl. No.	Name of the State/UT	Total no. of Healthcare Facilities (HCFs)	Total no. of captive incinerators installed by the HCFs	
			Incinerators with APCD	Incinerator without APCD or having single chamber
1	Andaman & Nicobar	29	06	Nil
2	Andhra Pradesh	7213	01	Nil
3	Arunachal Pradesh	44	01	01
4	Assam	1009	39	168
5	Bihar	174	15	Nil
6	Chandigarh	681	02	Nil
7	Chhattisgarh*	740	7	4
8	Daman, Diu and Dadra & Nagar Haveli	76	Nil	Nil
9	Delhi	3941	04	Nil
10	Goa	371	01	Nil
11	Gujarat	27201	Nil	Nil
12	Haryana	2375	01	Nil
13	Himachal Pradesh	570	02	01
14	Jharkhand	838	13	04
15	J&K	1136	04	02
16	Karnataka	26788	11	Nil
17	Kerala*	3399	50	39
18	Lakshadweep	11	00	01
19	Madhya Pradesh	2663	06	05
20	Maharashtra	51185	12	06
21	Manipur	577	04	Nil
22	Meghalaya	699	05	Nil
23	Mizoram	94	04 (not in operation)	Nil
24	Nagaland	118	Information not submitted	
25	Odisha	1415	06	Nil
26	Puducherry	127	01	02
27	Punjab	2935	Nil	Nil

Sl. No.	Name of the State/UT	Total no. of Healthcare Facilities (HCFs)	Total no. of captive incinerators installed by the HCFs	
			Incinerators with APCD	Incinerator without APCD or having single chamber
28	Rajasthan	3566	Nil	
29	Sikkim	48	06	Nil
30	Tamilnadu	5563	Nil	Nil
31	Tripura	1157	01	Nil
32	Uttrakhand	623	04	Nil
33	Uttar Pradesh	5711	20	Nil
34	West Bengal	6440	01	Nil
35	DGAFMS	321	204	Nil
Total		**159838**	**431**	**233**

Table : State-wise number of Common Bio-medical Waste Treatment Facilities (CBWTFs) in Operation under construction

Sl. No.	Name of the State/UT (Date of submission of Annual Report)	No. of Common Bio-medical Waste Treatment Facilities (CBWTFs)	
		In operation	Under Installation
1	Andaman & Nicobar	Nil	Nil
2	Andhra Pradesh	16	03
3	Arunachal Pradesh	Nil	Nil
4	Assam	05	Nil
5	Bihar	03	01
6	Chandigarh	02	Nil
7	Chhattisgarh*	06	0
8	Daman & Diu and Dadra & Nagar Haveli	01	Nil
9	Delhi	03	Nil
10	Goa	Nil	Nil
11	Gujarat	14	10
12	Haryana	12	01
13	Himachal Pradesh	03	Nil
14	Jharkhand	01	Nil
15	J & K	02	01
16	Karnataka	17	06
17	Kerala*	01	0
18	Lakshadweep	Nil	Nil
19	Madhya Pradesh	15	Nil
20	Maharashtra	34	02

Sl. No.	Name of the State/UT (Date of submission of Annual Report)	No. of Common Bio-medical Waste Treatment Facilities (CBWTFs)	
		In operation	Under Installation
21	Manipur	Nil	Nil
22	Meghalaya	01	Nil
23	Mizoram	Nil	Nil
24	Nagaland	Nil	Nil
25	Odisha	04	Nil
26	Puducherry	01	Nil
27	Punjab	04	01
28	Rajasthan	12	03
29	Sikkim	Nil	Nil
30	Tamilnadu	10	01
31	Tripura	01	Nil
32	Uttarakhand	01	Nil
33	Uttar Pradesh	15	Nil
34	West Bengal	06	Nil
Total		**190**	**29**

Status of Submission of Annual Report for the year 2013, by the SPCBs/PCCs & DGAFMS:

Annual Report Information on Bio-medical Waste Management for the year 2013 is received from 07 States namely Arunachal Pradesh, Himachal Pradesh, Meghalaya, Nagaland, Punjab, Tripura and Uttar Pradesh**,** within the due date i.e. 31.03.2014. *Following time* schedule *was communicated to all SPCBs and PCCs for ensuring timely submission of the annual report information to CPCB and to enable it in submission of the compiled Annual Report information to the Ministry of Environment & Forests (MoEF):*

Sl. No.	Proposed action/activity	Action to be taken	Time Target
(i)	Submission of compiled Annual Report (AR) by SPCBs/ PCCs and DGAFMS to CPCB for the preceding year as per the filled in formats to be submitted by the HCFs//CBWTFs / AFHCEs by 31st of January every year,	By SPCBs/ PCCs & DGAFMS	By 31st March of every year

(ii)	Compilation of AR submitted by the SPCBs/PCCs and DGAFMS and placing the same in CPCB web site (www.cpcb.nic.in)	By CPCB	By 30 th of April every year
(iii)	Verification of AR (Preliminary) information placed in CPCB web site and communicating the discrepancies found if any to CPCB	By SPCBs/ PCCs & DGAFMS	By 31st of May every year
(iv)	Rectification or Finalization of the AR based on the comments or views received from SPCBs/PCCs and DGAFMS	By CPCB	By 15 th of June every year
(v)	Communicating the finalized version of AR for the preceding year to MoEF and uploading of finalized version of AR in CPCB web site	By CPCB	By 30th of June every year

Inspection/Evaluation of HCFS and CBWTFs:

Substantial improvement was found in management of BMW in HCFs in Delhi subsequent to the orders of Hon'ble National Green Tribunal (NGT) in the matter of application No 63 of 2012. CPCB along with Delhi Pollution Control Committee (DPCC) and Haryana Pollution Control Board (HPCB) carried out inspection of 33 Healthcare Facilities (HCFs) in Delhi and 17 HCFs in Haryana State. The observations made during the visit to the HCFs and CBWTFs were apprised to the Hon'ble NGT as well as communicated to the respective SPCBs for intiating corrective measures and ensuring compliance to the provisions of BMW Rules and CPCB Guidelines, by the respective HCFs and CBWTFs.

The common observations made against the HCFs in Delhi:

- Most of the HCFs are the members of the Common Bio-medical Waste Treatment Facilities located in Delhi and ensuring treatment & final disposal of bio-medical waste generated by the individual HCFs. Only one HCF namely M/s. Lalaram Swarup Institute of Tuberculosis and Allied Diseases is not a member of the CBWTF and is involved in on-site treatment and disposal of the bio-medical waste.
- Some of the HCFs are operating treatment equipment such as autoclave and shredder for on-site treatment for recyclable plastic waste.
- Most of the visited HCFs have obtained authorization or were in the process of obtaining renewal of authorization from DPCC for generation, collection,

storage, transportation and disposal of bio-medical waste as required under BMW Rules.

- Some of the HCFs were not filing annual report to DPCC. It was also observed that some of the HCFs have submitted the annual reports to DPCC after the due date of January 31, 2013.
- In most of the HCFs segregation of BMW is done at source of generation the segregation however requires improvement in accordance with the BMW Rules.

Figure : Colour coded containers used for Source segregation of bio-medical waste

- Most of the hospitals have provided puncture proof containers for collection and storage of needle waste as per BMW Rules.

Figure 2. Puncture proof containers for storage of needle waste

- Most of the HCFs have made provision for separate room for temporary storage of bio-medical waste. The storage requires improvement in case of some of the HCFs.

Figure 3. Typical Temporary Storage Room provided for storage of bio-medical Waste

- Records pertaining to generation, collection, treatment and disposal of bio-medical waste require improvement in case of some of the hospitals.
- Plastic waste after treatment by autoclaving followed by shredding is sold to the local vendors but not to the plastic waste recyclers approved by DPCC.
- 21 out of 33 HCFs (02 HCFs are within the same campus) have installed sewage treatment plants while 11 HCFs have not installed sewage treatment plants.
- The analysis of waste water generated by the afore-said HCFs reveals the following:
  - pH value was in the order of 7.28 to 8.52;
  - TSS varied in the range of 07 to 181 mg/l;
  - BOD varied in the range of 03 to 129 mg/l; and
  - COD varied between 05 to 350 mg/l
- All the hospitals which have installed ETP/STP are partially recycling the treated water especially for horticulture.
- The analysis results w.r.t the mercury concentration for the 25 waste water samples collected during the visit to HCFs in Delhi reveals the following:
  - Hg concentration was in the order of BDL to 26.85 µg/l;
  - Hg concentration was observed as 'BDL'(i.e 1.00 µg/l) in 13 no. of samples
  - Minimum Hg concentration observed was 1.20 µg/l in the HCF namely Rajiv Gandhi Cancer Institute & Research Centre
  - Maximum concentration of Hg observed was 26.85 µg/l in the HCF namely Maharaja Agrasen Hospital;

- All the 33 no. of HCFs are using non-mercury based medical instruments at present and 02 of HCFs (namely Hindu Rao and Northern Railway Hospital) are using mercury based medical instruments, as they are in good condition.
- 03 HCFs are storing the mercury bearing waste within their premises (MAIDS, NRCH and RBIPMT)
- 30 of HCFs are reported to have disposed all the outdated medical instruments (Thermometers and BP Apparatus) through the recyclers authorized by the DPCC.
- Two HCFs namely AIIMS and MAIDS are using mercury based amalgam apart from the composites used for dental cavity filling.

Inspection HCFs in Haryana (NCR):

CPCB and HSPCB officials jointly inspected 17 nos. of HCFs in Haryana and made the following observations with regard to the status of compliance to the Bio-medical Waste (Management & Handling) Rules, 1998:

- 07 HCF had valid authorization and 10 HCFs had applied for renewal of authorization from HSPCB for generation, collection, storage, transportation and disposal of bio-medical waste as required under BMW Rules.
- All the HCFs are disposing the bio medical waste generated, through Common Bio-medical Waste Treatment Facilities (CBMWTFs) located in Haryana.
- In all HCFs, the team observed one or more deficiencies in respect of record keeping, annual report submission, segregation of BMW at source of generation, intramural transportation of waste, and temporary waste storage prior to handing over of the waste to the CBWTF for final treatment and disposal.
- 02 out of 17 HCFs are still using mercury based instruments (such as thermometers and B.P Apparatus).
- 04 outof the 17 HCFs have installed Effluent Treatment Plants.
- Besides the above, in compliance to the Hon'ble NGTs Order, CPCB along with DPCC and HSPCB also inspected 13 no. of CBWTFs located in Haryana during August to September 2013 to re-assess status of compliance to the provisions of Bio-medical Waste (Management & Handling) Rules, 1998 as amended and CPCB Guidelines.

Inspection carried out by CPCB Zonal Offices:

Zonal Offices, CPCB inspected 16 HCFs/CBWTFs in the country and actions were initiated against the no compliant HCF/CBWTF for violation of the provisions.

Directions / Verifications of compliance under Section 5 E(P) Act, 1986:

Central Pollution Control Board (CPCB) is pursuing continuously for ensuring compliance to the directions issued under Section 5 of the Environment (Protection)

Act, 1986 to the CBWTFs /HCFs. During the year 2013-2014, based on inspections, directions under section 5 of the E (P) Act, 1986 were issued to the two (02) CBWTFs located in the State of Madhya Pradesh and Karnataka and they were directed to submit a time bound action plan along with a bank guarantee of Rs. TenLakhs (10,00,000), to ensure compliance to the CPCB Directions. CPCB, Also issued closured directions to the (i) Municipal Corporation, Shimla, Himachal Pradesh for non-compliance to the provisions of Bio-medical Waste (Management & Handling) Rules, 1998.

Upon verification of compliance to the directions issued under Section 5 of the Environment (Protection) Act, 1986, the directions issued to the 03 CBWTFs & 01 HCF located in the States of Maharashtra, Orissa and Gujarat have been revoked.

Common Observations w.r.t CBMWTFs:

Non-compliance to one or more of the following points have been observed in CBMWTFS being operated in the country.

- *Separate rooms for treatment equipment, main waste storage, treated waste storage etc. for handling of bio-medical waste is not provided as per CPCB guidelines.*
- *Conveyer or automatic feeding device for charging the bio-medical waste into the incinerator not provided aid and manual feeding of waste is in practice;*
- *The system for automatic recording of the operational parameters of the incinerator as well as tamper proof Programmable Logic Control (PLC) based waste feeding mechanism not attached with the incinerator, as required under the CPCB guidelines;*
- *Devices for measuring negative draft in primary chamber, air flow rate in the incinerator chamber and pressure drop across venture scrubber are not attached with the incinerator;*
- *Flue gas analyzer for measurement of CO, O_2& CO_2 level in the stack gases not provided in CBWTFs, neither records are maintained as per CPCB guidelines;*
- *The stack monitoring provision (such as platform, porthole etc.) not provided in stack attached with the incinerator in some of the CBWTFs as per the CPCB guidelines;*
- *Autoclave is not installed or efficacy test are not conducted as required for treatment of bio-medical waste in the facilities to ensure complete sterilization of bio-medical waste as per BMW Rules;*
- *Shredder is not provided with collection bin of adequate size for collection of shredded waste from shredder and separate storage provision provided for storage of treated plastic waste;*
- *Log books are not maintained w.r.t operational parameters of treatment equipment, handling, treatment & disposal of bio-medical waste as well as*

documents related to regulatory compliance violating the provisions of Rule 11 of the BMW Rules;

- *Designated facility for washing of vehicle is not provided as required under CPCB guidelines and vehicle wash water and scrubber bleed is not routed to the effluent treatment plant;*
- *Records w.r.t waste collection from HCFs, treated and disposal of treated waste to the recycler is not maintained;*
- *Designated colour coded bins are not used while transporting the collected waste from member HCFs;*
- *Ash generated from the incinerator is not analyzed for hazardous constituents through a laboratory recognized under the E (P) Act, 1986 for ascertaining the hazardous constituents as per HW (M, H & TM) Rules, 2008 and for arriving at the suitable disposal option, if required through a TSDFs;*
- *Effluent Treatment Plants provided in some of the CBWTFs are incomplete and requires improvement so as to ensure proper treatment of wastewater generated from the facility and to ensure discharge norms stipulated under BMW Rules;*
- *Separate space for parking of vehicles used for transportation of bio-medical waste is not provided;*
- *Sharp-pit/encapsulation facilities and pit for disposal of incineration ash are not provided as per CPCB guidelines;*
- *The CBWTFs has not installed D. G. Set as standby arrangements for operation of the incinerator in case of power failure;*
- *The CBWTFs need to develop adequate green belt within the facility;*
- *Sign boards / Display boards with bio-hazard symbol (as per BMW Rules) at all the salient locations in the CBWTFs as well as telephone facility is not provided; and*
- *Proper firefighting equipment including sand buckets, fire extinguisher and fire alarm etc. is not provided at salient points in the CBWTFs under the BMW Rules etc..*

Compliance verification of CBWTF in Central Zone

Under the jurisdiction of central Zone total 18 CBWTF (with incinerator) are operational. Performance evaluation of 14 CBMWTFs was completed under the project 'compliance verification of CBWTF in central zone' during the year 2013-14. The observations of inspection and monitoring were recorded and respective SPCBs directed to take necessary action. The general deficiencies in CBMWT facilities observed are as given below:

1. Most of the facilities in Rajasthan are not having valid authorization.

2. Segregation of waste at source is not being done by the individual HCFs and mix type of waste is being received in CBWTF.
3. Most of the incinerators were found to be lacking in complete compliance of operating parameters.
4. Less quantity of plastic waste is being received by the operator.
5. Most of the facilities are not obtaining TSDF membership for Incineration Ash disposal and dumping of ash at MSW site is a common practices.
6. Condition of ETP was also not found satisfactory in most of the facilities.
7. Separate room for treated waste storage, autoclave & shredder were not provided by most of the facilities.

Inspection of Bio-medical Waste Management Facilities in North Zone

During the year 2013-14, CPCB Z.O. Lucknow carried out inspections of five Common Bio-Medical Waste Treatment Facilities spread over Varanasi, Agra, Faizabad, Haridwar and Meerut. Salient observations made during the inspection are summarized as under:

a. In most of the CBWTFs, the segregation of waste is not being done at source. Eventually mixed waste is being incinerated by the facility operators

Interactive session of workshop in progress

Participants deliberating actively

Mixed Waste for incineration at CBWTF

Waste being dumped within CBWTF

b. It was observed that Sharp waste including the needles are spread on the open earth within the site.

Scattered sharp waste within CBWTF

c. In most of the cases, the incineration ash is being dumped in low lying area within the CBWTF. In few cases, it is sent to TSDF for final disposal.

Dumping of the incineration ash

d. It was observed that Pre treated Waste Storage room for the waste collected from various HCFs members not provided as per the BMW Guidelines.

Photographs showing the Pre storage room for Untreated Waste

f. The ETP in most of the cases are not operated and were found closed.

g. The mixed sharp were dumped in the sharp pit i.e metallic sharp mixed with glass sharp which should not be in practice, as after exhausting the sharp pit segregating the metallic sharp from glass sharp is not possible.

Organization/sponsoring of programmes on Bio-medical Waste Management

Central Pollution Control Board (CPCB) organized an 'Interaction Meet' in the month of March, 2014 with the Common Bio-medical Waste Treatment Facility operators of western zone to deliberate the issues relating to (i) Provisions of BMW Rules relevant to the CBWTFs, (ii) Salient features of Guidelines for CBWTFs; (iii) Deficiencies observed as per the inspections made during the visit to the CBWTFs; (iv) Draft Revised "Guidelines for Common Bio-medical Waste Treatment Facilities" seeking comments from the operators of CBWTFs of Western Zone; (v) Steps to be taken by the CBWTFs for ensuring compliance to the Bio-medical Waste (Management & Handling) Rules, 1998 as well as CPCB Guidelines. Action plan also proposed for ensuring compliance to the BMW Rules and CPCB Guidelines for CBWTFs, by all the CBWTFs.

ZO-Vadodara

Interaction Meet with the Operators of the Common Bio-Medical Waste Treatment Facilities

The Zonal Office Vadodara, organized a one day interaction meet on March 08, 2014 at Vadodara with the operators of the Common Bio-medical Waste Treatment Facilities (CBMWTFs) to deliberate the issues relating to (i) review of the existing 'Guidelines for Common Bio-medical Waste Treatment Facility' in light of the proposed amendments to the Bio-medical Waste (Management & Handling) Rules, 1998 and (ii) the steps to be taken by the CBMWTFs for ensuring compliance to the BMW Rules, with the objective of effective management of bio-medical waste. There response was overwhelming from the CBMWTFs participation. Besides CPCB & CBMWTFs, the interaction meet was also attended by the participants from the health care facilities, armed forces medical services, Gujarat Pollution Control Board & Maharashtra Pollution Control Board. In all about 70 participants attended the meet.

All the speakers as well as participants deliberated actively and shared/provided their experience, feedback, suggestion & comments about BMW management aspects & current Indian scenario of implementation of BMW Rules, which would be helpful in reviewing the existing guidelines for CBMWTF, suitably and for effective management & handling of BMW.

Interaction meet held at Shillong with the CBWTF Operators located in North Estern States

CPCB organized one workshop on 'bio-medical waste management' aspects in association with the Zonal Office, Shillong for the stakeholders of North-Eastern States.

Review of Existing CPCB Guidelines for CBWTFs:

Existing CPCB guidelines for Common Bio-medical Waste Treatment Facilities are in the process of revision and draft revised guidelines have been placed on CPCB website and also circulated to the stakeholders seeking views/comments.

Performance assessment of Waste-to-Energy Plant, Okhla, Delhi

The Hon'ble National Green Tribunal, Principal Bench, New Delhi, in the matter of Application No. 22 of 2013 (THC), Sukhdev Vihar Residents Welfare Association &

Others Vs. State of NCT of Delhi & Others, in its order dated 19/02/2014, directed CPCB, DPCC and Ministry of Environment and Forests to inspect the plant and submit a comprehensive report including the analyses report.

In compliance with the aforesaid orders surprise inspection of the Waste to Energy plant, Okhla, was conducted jointly by a team comprising officials of Central Pollution Control Board (CPCB), Delhi Pollution Control Committee (DPCC) and Ministry of Environment & Forests (MoEF) on 25/02/2014. Subsequently, stack emission monitoring was also conducted by CPCB, DPCC and M/s Vimta Labs and samples analysed by the respective sampling organization in their own laboratory. A comprehensive report has been submitted and the matter is under Hon'ble NGT.

Implementation of the E-Waste (Management & Handling) Rules, 2011

E-Waste (Management & Handling) Rules, 2011 have come into effect since 01-05-2012.These rules are applicable to every producer, consumer or bulk consumer, collection centre, dismantler and recycler of e-waste involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components specified in schedule – I. Two categories of end of the life electrical and electronic equipment namely (i) IT and Telecommunication Equipment and (ii.) Consumer Electricals and Electronics such as TVs, Washing Machines, Refrigerators and Air Conditioners are covered under these Rules.

Extended Producer's Responsibility (EPR) is the main feature of the E-waste (Management and Handling) Rules, 2011, wherein the producer of electrical and electronic equipment has the responsibility of managing such equipment after its 'end of life', thus the producer is responsible for their products once the consumer discards them. Under this EPR, producer is also entrusted with the responsibility to finance and organize a system to meet the costs involved in complying with EPR.

State Pollution Control Boards/Committees are the prescribed authority for implementation of E-waste Rules in respective States. The CPCB is the prescribed authority for implementing Reduction of Hazardous Substances (RoHS) in manufacturing of items listed in Schedule-I.

The producers are required to obtain authorization from SPCB/PCCs for implementing their EPR, which can be achieved by setting up collection centres, or implementing take back systems or joining a collective scheme or joining a collection centre for effective channelization of E-waste to the registered dismantlers/recyclers which shall be specified in their application for authorization. The scope of implementing the EPR is described in Figure.

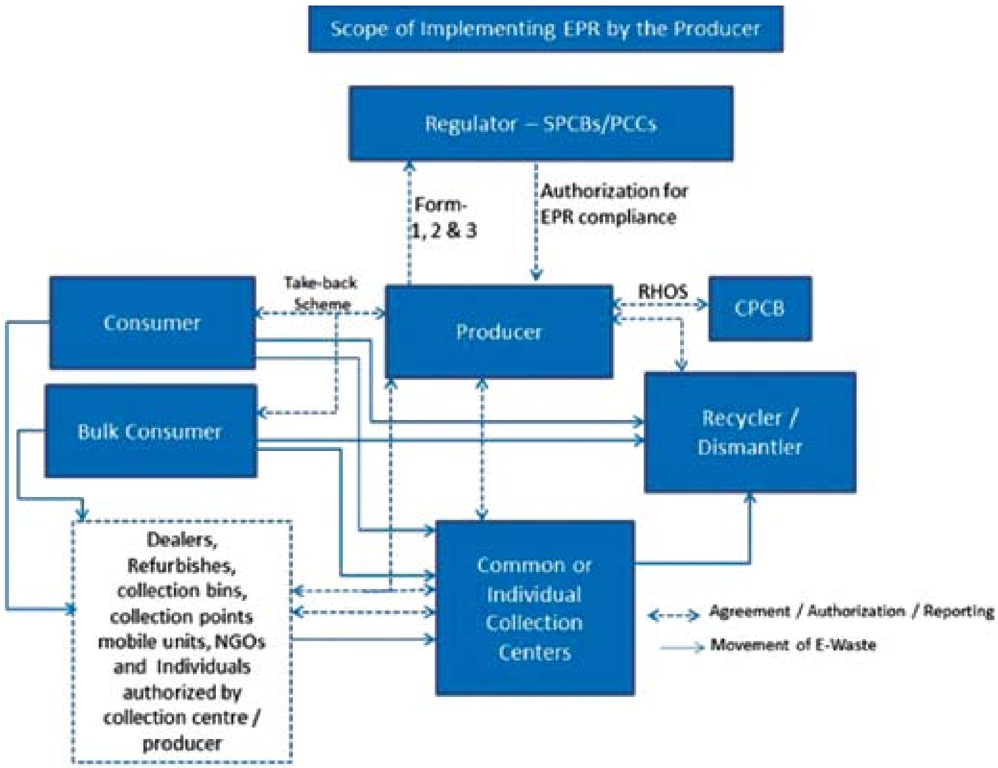


Figure 1. Flow diagram for implementing EPR

As per the available information sixty one (61) producers have applied for grant of authorisation for managing their EPR in ten (10) states namely Andhra Pradesh (3), Delhi (19), Gujarat (2), Goa (1), Karnataka (16), Maharashtra (2), Odisha (1), Rajasthan(3), Uttar Pradesh(5) and West Bengal(9), of which only 35 Producers have been granted authorisation in six states namely Andhra Pradesh (3), Delhi (12), Karnataka (16), Maharashtra (2), Rajasthan (1) and UP (1). Details are in given in the Table.

Table : EPR Authorizations state wise applied/issued

Sl. No.	State	No of Producers applied for EPR Authorisation	No of Producers granted authorisation for EPR
1.	AP	3	3
2.	Delhi	19	12
3.	Gujarat	2	Nil
4.	Goa	1	Nil
5.	Karnataka	16	16
6.	Maharashtra	2	2
7.	Odisha	1	Nil
8.	Rajasthan	3	1
9.	West Bengal	9	Nil
10.	UP	5	1
Total		**61**	**35**

As per the available information seventy six (76) collection centres have been granted authorisation in twelve (12) states namely Andhra Pradesh (2), Assam (2), Chandigarh (1), Delhi (9), Gujarat (29), Goa (2), Kerala (2), MP (1), Maharashtra(6), Odisha (5), Uttrakhand (1) and UP (16). Information on the total collection capacity is not available with CPCB. The information on capacity is being collected.Details are given in the Table.

Table : Collection centres existing in different States

Sl. No.	State	Authorisation granted to collection centres
1.	AP	2
2.	Assam	2
3.	Chandigarh	1
4.	Delhi	9
5.	Gujarat	29
6.	Goa	2
7.	Kerala	2
8.	Madhya Pradesh	1
9.	Maharashtra	6
10.	Odisha	5
11.	Uttrakhand	1
12.	UP	16
Total		**76**

As per the available information ninety eight (98) registration has been granted to dismantler/recyclers in thirteen (13) states namely Andhra Pradesh (2), Chhattisgarh (1), Delhi (4), Gujarat (4), Haryana (4), Karnataka (27), Maharashtra (18), Madhya Pradesh(1), Rajasthan (6), Tamil Nadu (19), Uttrakhand (3), UP (8) and West Bengal(1) having total dismantling and recycling capacity of 2,92, 457 MTA. The details are given in the Table.

Table : Registered dismantlers/recyclers

Sl. No	State	No. of Registered dismantlers/ recyclers	Capacity in MTA
1.	Andhra Pradesh	2	11800
2.	Chhattisgarh	1	900
3.	Delhi	4	-
4.	Gujarat	4	12431
5.	Haryana	4	6100
6.	Karnataka	27	23090
7.	Maharashtra	18 (17 dismantler 1 recycler)	20960

Sl. No	State	No. of Registered dismantlers/ recyclers	Capacity in MTA
8.	MP	1	6000
9.	Rajasthan	6	5130
10.	TN	19	154436
11.	Uttrakhand	3	22150
12.	UP	8	29460
13.	West Bengal	1	600
Total		**98**	**293057**

Preparation of way forward document for RoHS (Reduction of Hazardous Substance) regulation implementation

Central Pollution Control Board has been given the responsibility of enforcing of RoHS as per Rule 13 of the E-Waste (M&H) Rules, 2011. However, the said Rules do not outline set procedure for enforcement. Verification of compliance to RoHS may require extensive testing of EEE, which is not actually a waste material. The laboratory infrastructure available at CPCB is only equipped for testing of water, air and waste samples, and not having capabilities for testing EEE samples under RoHS compliance. It may take time to develop a dedicated testing laboratory at CPCB including the training of scientific staff in sampling and testing.

There are large number of Producers and thousands of products being placed on the market on regular basis, which makes it virtually in possible to test every component in the market. It is also envisaged that with the available infrastructure and manpower at CPCB, RoHS cannot be enforced by typical certification process unlike the certifications process being adopted for DG Sets, Fire Crackers, etc.

In view of the above constraints an implementation frame work for RoHS enforcement as given below was proposed:

i. Implementation of RoHS based on **self-regulation model** that may include the following components:
   a. Developing a Central Registry of Producers
   b. Development of a mechanism for self-declaration on RoHS compliance
   c. Development of a dynamic database on various EEEs being placed in the market by Producers
   d. Random verification on RoHS (of both declared and non- declared EEEs)
ii. Inclusion of information on RoHS while granting authorization by SPCBs
iii. A CPCB does not have a dedicated Laboratory for RoHS testing, it may enter into an MoU with other laboratory like C-MET (Centre for Material for Electronic technology) RoHS laboratory, located at Hyderabad for a period of 3 years for using Lab facilities for RoHS testing, development of sampling and testing

methodologies and protocol for enlisting RoHS test laboratories.

iv. CPCB to take-up mass awareness programs through newspaper and visual media

The above proposal has been submitted to MoEF for their concurrence

Implementation of the Batteries (Management and Handling) Rules, 2001

Status of Compliance under Batteries Rules

Under rule 13 of the Batteries (M&H), Rules CPCB has to compile and publish data received from SPCBS/PCCS on yearly been and to review the compliance of the rules periodically to improve the collection and recycling of used Lead Acid Batteries and appraise the Ministry of Environment and Forests, Government of India. However, such report could not be forwarded to MoEF since there has been poor response from SPCBs/PCCs. Annual compliance Status reports were received from only 2 SPCBs during the year.

All the SPCBs/PCCs have been requested repeatedly form CPCB to ensure submission of Annual compliance status reports. The SPCB/PCCS were also requested to take action against those stakeholders not-filing returns to State Boards/PCCs such as Manufacturer, Reconditioner, Assembler, Dealer, Importer, Bulk consumer, Auctioneer and Recycler found violating the provisions of Batteries Rules.

CPCB has organized one day Mass awareness programme at Lucknow on 25th March, 2014 through Zonal office, Lucknow, wherein many stakeholders from northern region participated.

On-line Batteries (Importer) Registration and Management System (BRMS):

There is enormous growth in the demand for new lead acid batteries in the country – resulting in increased import of new lead acid batteries.CPCB had launched On-line Batteries (Importer) Registration and Management System (BRMS) during the last financial year 2012-13 and the system was found effective and operational. The status of registrations granted on-line by CPCB is given below;

Registration granted to Importers of New Lead Acid Batteries as on 01.03.2014 : **1835**
On-line registration granted to Importers of New Lead Acid Batteries as on 01.03.2014 : **131**
Half-yearly returns tiled by the Importers of New Lead Acid Batteries as on 19.06.2013 : **410**

Workshop on Managemet of Battery Waste

One day-Awareness Workshop on Implementation of Battery (Management & Handling) Rules, 2001 was organized by CPCB ZO Lucknow at Lucknow on

March 25, 2014. The Workshop was inaugurated by Sh J.S.Yadav, Member Secretary, U.P. Pollution Control Board and attended by representatives of companies engaged in Manufacture, Import, Recycle, Sale and bulk use of Batteries. The event had presence of Sh L. Pugazhenthy, Executive Director, Indian Lead Zinc Development Association and also participated by representative of NGOs, SPCBs, PCCs.. Altogether 51 number of participants attended the Workshop Resolutions taken during the Workshop are summarized as under :

- The manufactures should be directed to sell the new batteries only though the dealers registered by SPCBs.
- All SPCBs/PCCs shall update the list of manufactures, dealers, assemblers and re-conditioners.
- SPCBs may develop online systems for tracking the sale of new batteries and collection of used batteries in the State.
- SPCBs may continue to issue registration of recyclers under HWM Rules 2008 for recycling of used battery plates, battery scrap – 'Rails', 'Rakes' and 'Rains' till necessary clarification is provided for their registration under Batteries Rules by MoEF.
- Regarding operation of illegal battery melting furnaces in some States, State Boards will step – up vigilance to track illegal recyclers and submit a status reports to CPCB.
- Mass awareness is required for workers of the recycling units on occupational health hazard in handling lead acid batteries.
- Like e–waste rules EPR mechanism should be developed for battery recycling.
- The software developed for importers of battery should be replicated for registration of dealers along with auto generation of certificate at dealers end.
- Manufactures to be mandated to conduct periodical awareness programme down to taluk and village level for the dealers; the number of collection centres to be increased by manufacture and wide publicity to be given.
- The present incentives to consumers for returning the used Batteries may be revised taking into account the practices in other countries.
- Bulk Consumer may directly tie up with the registered secondary smelter/ recyclers for disposal of ULAB to avoid scape of feeding illegal smelting.
- Large Recycling unit may conduct environmental audit against the internationally Recognized Green Lead Practices for their own benefit.

Performance Evaluation of Common Effluent Treatment Plants and Sewage Treatment Plants of Haryana

In-compliance to the orders of Hon'ble Punjab & Haryana High Court, CPCB conducted performance evaluation of 10 CETPs located in Haryana State Industrial & Infrastructure Development Corporation Ltd (HSIIDC) and 39 STPs (as per the list provided by Haryana State Pollution Control Board) located in 27 towns of Haryana. List of the STPs provided by Haryana State Pollution Control Board is depicted in the Table---.

Table : List of sewage treatment plants in Haryana

STPs in Working Condition			No. & Capacity of STP	
Sl. No.	Name of Towns	Population (2011)	No.	Capacity (in MLD)
1.	Ambala City	1740288	1	8
			1	3.25
2.	Bahadurgarh	149799	1	14
			1 (HUDA)	10
3.	Beri	20183	1	2
4.	Bhiwani	211780	1	30
5.	Faridabad	1318726	1 (PHED)	45
			1 (ULB)	20
			1 (ULB)	40
			1 (PHED)	50
6.	Gohana	60846	1	3
7.	Gharaunda	37724	1	3
8.	Gurgaon	216928	1 (ULB)	30
			1 (ULB)	68
9.	Hodal	27883	1	9
10.	Indri	18144	1	1.5
11.	Jagadhri	12625	1	10
12.	Jhajjar	48756	1	5.5
13.	Jind	170111	1	15
14.	Kaithal	146533	1	10
			1	10
15.	Kalka	38809	1	1.3
16.	Kalanaur	21069	1	3.5
17.	Karnal	283095	1	8
			1	40
18.	Meham	23278	1	5
19.	Narwana	69324	1	3.5
			1	3.75
20.	Panchkula	176240	1 (HUDA)	30
			1 (HUDA)	27
			1 (HUDA)	15

STPs in Working Condition			No. & Capacity of STP	
Sl. No.	**Name of Towns**	**Population (2011)**	**No.**	**Capacity (in MLD)**
21.	Panipat	327081	1	10
			1	35
22.	Palwal	125650	1	9
23.	Rohtak	358466	1 (HUDA)	10
24.	Rewari	126183	1	8
25.	Sampla	24596	1	4
26.	Sonipat	270266	1	30
27.	Yamuna Nagar	236984	1	20
Total			**39**	**650.3**

Note: *In addition to above, work for construction of 21 STPs (15 PHED + 5 HUDA + 1 ULB will total treatment capicity of 467.30 MLD is in progress.*

The analytical results of the samples collected are given in Table--.

Table : Performance of Sewage Treatment Plants

Sl. No.	Town	STP	Date of monitoring	Installed Capacity (MLD)	Actual treat-ment (MLD)	Parameters					
						Inlet			Outlet		
						BOD (mg/l)	COD (mg/l)	TSS (mg/l)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)
General Discharge Standards for Inland Surface Water									**30**	**250**	**100**
1.	Panchkula	STP Panchkula Sector 20	18/05/2013	18	15	118	333	164	09	90	34
2.		STP Panchkula Sector 20	18/05/2013	39	35	86	321	205	13	73	47
3.		STP Panchkula Sector 28	18/05/2013	15	10	16	75	495	09	90	34
4.	Kalka	STP Kalka	19/05/2013	1.2	304	732	456	Effluent Bypassed			
5.	Sonipat	STP Sonipat	21/05/2013	30	-		Non-operational				
6.	Gohana	STP Gohana	21/05/2013	8.3	-		Non-operational				
7.	Panipat	STP PanipatDodala road, Siwah	23/05/2013	35	35	265	532	412	***98***	***254***	59
8.		STP PanipatJattal Road	23/05/2013	10	17	200	401	168	***117***	238	***114***
9.	Karnal	STP Karnal Sector 4	23/05/2013	40	38	158	326	177	***33***	65	43
10.		STP Karnal Kaithal Road	23/05/2013	8	4						
11.	Gharaunda	STP Gharaunda	23/05/2013	1.5	1.5	-			***36***	76	696
12.	Rewari	STP Rewari	21/05/2013	8	17	218	466	313	***31***	209	47
13.	Gurgaon	STP Dhanwapur	21/05/2013	30	-	255	520	434	***192***	***398***	332
14.		STP Dhanwapur	21/05/2013	67.5	135	154	341	431	20	92	58
15.	Bhadurgarh	STP Linepaar Area, Bhadurgarh	23/05/2013	18	10	155	310	131	21	77	44
16.		STP Chhara Road, near PDM college, Bhadurgarh	23/05/2013	10	0	26	141	57	***83***	***287***	60
17.	Jhajar	STP Kosli Road, Jhajar	23/05/2013	5	-	445	900	851	***37***	85	71
18.	Beri	STP, Beri Town	23/05/2013	2	2	35	143	74	29	123	69
19.	Kalanur	STP, Jindran Road	23/05/2013	3.5	2.5	4452	9023	39074	***316***	***627***	***902***

Sl. No.	Town	STP	Date of monitoring	Installed Capacity (MLD)	Actual treat-ment (MLD)	Parameters					
						Inlet			Outlet		
						BOD (mg/l)	COD (mg/l)	TSS (mg/l)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)
20.	Rohtak	STP Maham	23/05/2013	5	5	201	652	1019	***41***	86	70
21.		STP Singpura	23/05/2013	10	16	46	102	601	16	37	84
22.	Hodal	STP Hodal, Gadi Road	24/05/2013	9	-	35	179	278	16	91	53
23.	Palwal	STP Palwal	24/05/2013	9	8	51	316	454	24	227	***132***
24.	Balabgarh	STP Partapgarh	24/05/2013	50	38	182	534	809	***34***	***347***	***140***
25.	Faridabad	STP Mirazapur	24/05/2013	45	15	45	249	525	***34***	***277***	***165***
26.		STP Badshapur	24/05/2013	45 (SBR)	20	87	350	367	10	62	65
27.		STP Badshapur	24/05/2013	20 (UASB)	10	87	350	367	14	95	71
28	Jind	STP, Jind	28/5/2013	15 (MBBR)	7-8	628	1378	3496	19	118	73
29.	Uchana	STP, Uchana	28/5/2013	4.5 (EA)	4-5	180	509	730	***34***	157	***121***
30	Narvana	STP, Narvana	28/5/2013	3.5(MBBR)	3.5	07	43	58	***38***	216	***515***
31		STP- II No., Narvana	28/5/2013	3.75 (MBBR)	3.75	97	333	288	09	63	26
33	Kaithal	STP-SBR, Kaithal	28/5/2013	10 (SBR)	6-7	75	228	68	04	20	14
33		STP-MBBR, Kaithal	28/5/2013	10(MBBR)	6-8	61	239	62	***41***	133	39
34	Ambala	STP- Ambala City BaldevNagar	28/5/2013	5	4.5	113	352	177	03	17	28
35		STP Ambala City NayaGaon	28/05/2013	3.25	1	05	19	275	03	17	28
36	Indri	STP Indri	29/05/2013	1.5	1.2	No Flow was observed					
37	Yamuna Nagar	STP Yamuna Nagar-Radaur Road	29/05/2013	25	34	84	358	203	28	111	22
38		STP Yamuna Nagar-BaddiMajra	29/05/2013	10	15	133	495	278	23	138	11
39	Bhiwani	STP-Bhiwani	30/05/2013	30	30	442	190	659	***42***	27	90

Note: Values exceed the discharge standards

Table : Performance of Common Effluent Treatment Plants

Sl. No.	Town	CETP	Date of monitoring	Installed Capacity (MLD)	Actual treatment (MLD)	Parameters					
						Inlet			Outlet		
						BOD (mg/l)	COD (mg/l)	TSS (mg/l)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)
CETP notified standards into Inland Surface Waters									**30**	**250**	**100**
1.	Sonipat	Kundli – HSIIDC	21/05/2013	4	2	194	396	158	22	118	41
2.		Rai – HSIIDC	21/05/2013	5	2.5	141	303	209	12	38	24
3.		Barhi – HSIIDC	21/05/2013	8	10	471	1225	268	84	289	214
4.		Murthal – HSIIDC	21/05/2013	0.2	0.2	174	373	280	***58***	135	97
5.	Panipat	Panipat – HSIIDC	23/05/2013	21	18	145	299	425	***39***	***115***	95
6.	Panchkula	CETP Barwala-HSIIDC	19/05/2013	0.5	0.25	16	49	77	06	23	19
7.	Gurgaon	CETP Manesar - HSIIDC	21/05/2013	15	0.62	1302	4597	9793	27	138	30

Sl. No.	Town	CETP	Date of monitoring	Installed Capacity (MLD)	Actual treatment (MLD)	Parameters					
						Inlet			Outlet		
						BOD (mg/l)	COD (mg/l)	TSS (mg/l)	BOD (mg/l)	COD (mg/l)	TSS (mg/l)
CETP notified standards into Inland Surface Waters									**30**	**250**	**100**
8.	Balabgarh	CETP for Small scale electroplating units	24/05/2013	0.67	0.4	158	946	1448	28	196	89
9	Jind	CETP for few units	28/5/2013	1 lakh litre	-	344	969	774	***43***	***248***	***314***
10.	Ambala Cant.	Jagadhari Road –HSIIDC	28/05/2013	0.5	0.3	192	666	364	***77***	***305***	***103***

Note: Values marked bold

Examination of the analytical results presented in Tables and reveal the following:-

Status of Sewage Treatment Plants (with respect to discharge standards)

1. Out of 39 STPs inspected the STPs listed in table no do not meet the General Standards as specific with respect to BOD, COD and TSS under Schedule-VI of The Environment (Protection) Rules, 1986 for Discharge of Environmental Pollutants into inland surface, public Sewers, land for irrigation, marine coastal areas. The treated sewage the 03 parameters ie of BOD, COD & TSS while in case of 06 STPs the value of BOD & COD or BOD & TSS exceeded the prescribed norms.

   The BOD values were higher in treated samples collected from 16 STPs while the value of COD exceeded the prescribed norms in the treated effluent collected from 06 STPs and TSS exceeded in 09 samples.

Table ---: Performance of sewage treetment Plant

Sl. No	Sewage Treatment Plant	Exceeding parameters		
		BOD	COD	TSS
1.	STP Panipat-35 MLD located at Dodala road, Siwah	✓	✓	X
2.	STP Panipat-100 MLD located at Jattal road	✓	X	✓
3.	STP Karnal, Sector-4, 40 MLD capacity	✓	X	X
4.	STP Gharaunda- 1.5 MLD	✓	X	✓
5.	STP Rewari- 8 MLD	✓	X	X
6.	STP Dhanwapur- 30 MLD	✓	✓	✓
7.	STP Chhara, Bhadurgarh- 10 MLD	✓	✓	X
8.	STP Kosli, Jhajar- 5 MLD	✓	X	X
9.	STP Jindran Road- 3.5 MLD located at Kalanur	✓	✓	✓
10.	STP Maham, Rohtak 5 MLD	✓	X	X
11.	STP Partapgarh, Balabgarh, 50 MLD	✓	✓	✓
12.	STP Mirzapur, Faridabad, 45 MLD	✓	✓	✓

Sl. No	Sewage Treatment Plant	Exceeding parameters		
		BOD	COD	TSS
13.	STP Uchana - 4.5 MLD	✓	X	✓
14.	STP Narvana - 3.5 MLD	✓	X	✓
15.	STP Kaithal – 10 MLD	✓	X	X
16.	STP Bhiwani - 30 MLD	✓	X	X
17.	STP Palwal – 9 MLD	X	X	✓

Note: *X denotes meeting the Standards*

✓ *Denotes exceeding the standards*

Out of 39 STPs, 11 STPs as detailed below are non-functional:

1. STP Sonipat
2. STP Gohana
3. STP Karnal-Kaithal road
4. STPRewari
5. STP Dhanwapur- 30 MLD Jhajar
6. STP located at Maham
7. STP located at Hodal
8. STP located at Gharaunda
9. STP located at Kalka
10. STP located at Indri

Status of Common Effluent Treatment Plants (with respect to discharge standards)

1. Out of 10 CETPs inspected, 05 CETPs are not meeting the Standards presented for BOD, COD and TSS under Schedule-I of the Environment (Protection) Rules, 1986 for discharge of Environmental Pollutants into inland surface, public sewers, land for irrigation, marine coastal areas as specified. The treated effluent of 02 CETPs does not conform the norms for all the 03 parameter (BOD, COD & TSS)while in case of 01 to CETPs the value of BOD & COD exceeds the prescribed norms.

Sl. No	Common Treatment Plant	Exceeding parameters		
		BOD	COD	TSS
1.	CETP Barhi	✓	✓	X
2.	CETP Murthal	✓	X	X
3.	CETP Panipat	✓	X	X
4.	CETP Jind	✓	✓	✓
5.	CETP Ambala Cantonment	✓	✓	✓

Note: X denotes meeting the Standards

✓ *Denotes exceeding the standards*

Clean Technology for SME Clusters

Under the Project on **Cleaner Technologies (CT)** for SMES Clusters sponsored by MoEF, the following three sectoral studies were prepared.

1. Used/Waste Oil Re-processors

a. In India, there are 36,165 industries, generating 62,32,507 Metric Tonnes of Hazardous Waste (HW) every year.

b. Recyclable waste attributes to the dominant HW treatment option 49.55% followed by land disposable (43.78 %) and incineration (6.67 %) respectively.

c. Under the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 the processes generating HW were finalized, yet the differentiation of quantum of HW generation based on types of HW i.e used / waste oil, lead waste, zinc waste etc. has been highlighted first of its kind as an inventory in the present study.

d. There are 257 Spent oil (Used/Waste Oil) registered recycling facilities distributed across 124 districts spread over 19 states in India with the total spent oil recycling capacity of 1.39 MMT.

e. Thus India has a huge recycling potential with a greater yield while considering the generation of used oil and waste oil from automotive sector and manufacturing industries. However, the major constraint faced in recycling waste / used oil is cost of the collection, storage & subsequent transportation of the waste to the recycling unit.

2. Tanneries

A study was taken up to identify tannery clusters in India and the cleaner production practices adoptable in the clusters.

The Study identified 113 Tannery Clusters in India with highest number of dedicated CETPs showing a strong initiative for greener indentation. Four Tannery intensive states identified in the study are Tamil Nadu, Uttar Pradesh, West Bengal and Punjab. Other States with prominence of tannery activities are Haryana, Maharashtra, Bihar, Andhra Pradesh, Rajasthan, with fewer units in Gujarat, Karnataka, Odisha, Delhi, Himachal Pradesh, Uttarakhand and Goa (scattered units).

Jalandhar (Punjab) cluster has highest number of Medium scale units and second highest number of large scale units after Tamil Nadu, in spite of the huge difference in total number of units in the clusters. Unit wise Tamil Nadu has the highest number of units involved in tannery activities, followed by, West Bengal (Calcutta Leather Complex), Uttar Pradesh (Jajmau), and Punjab (Jalandhar). Various cleaner process technologies and waste management practices were brought into fore front. A comparative assessment for various waste management practices (Solid, Liquid and chromium) adopted in the four tannery intensive states has been provided in the report along with the way forward and recommendations.

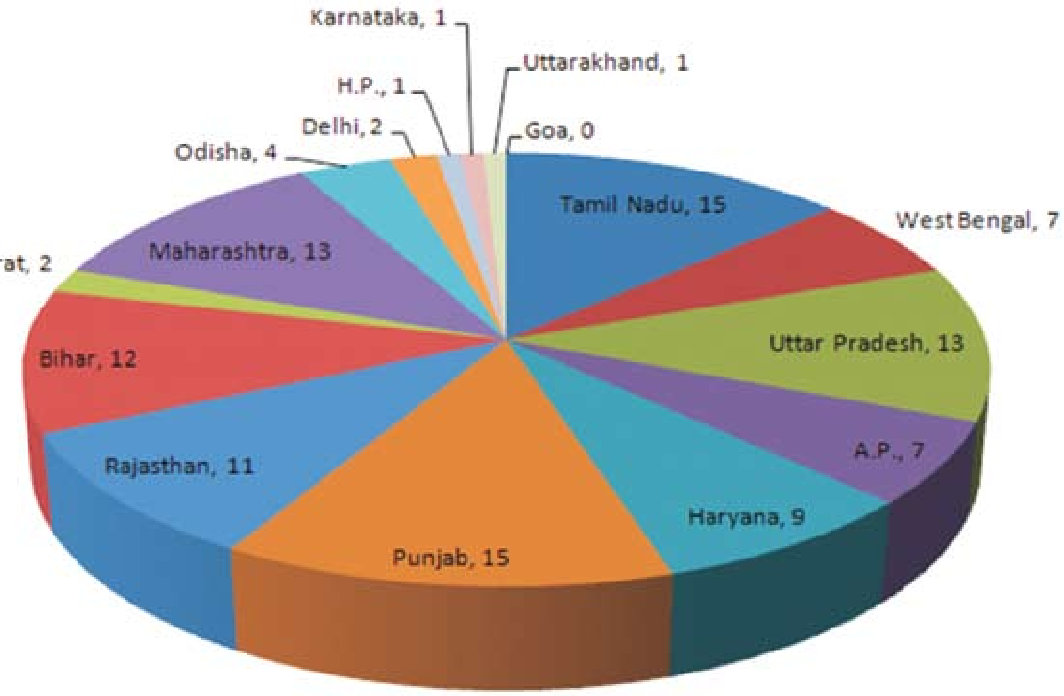


Fig: Tannery Clusters in India

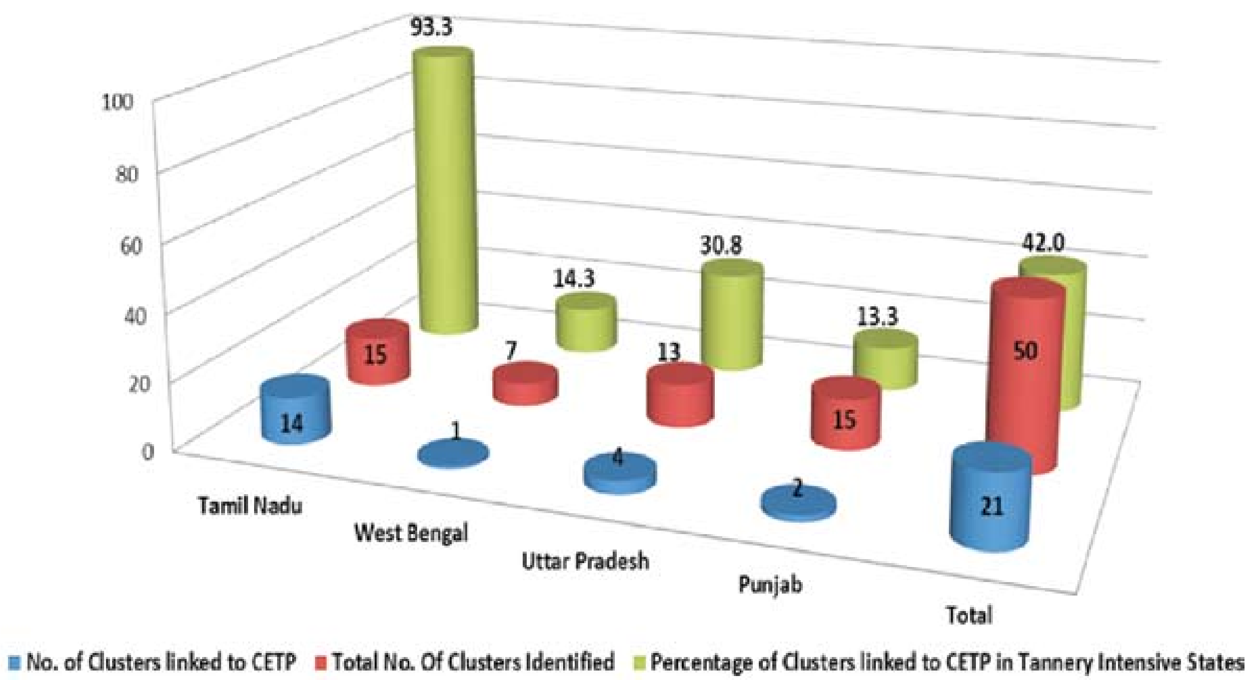


Fig: Fraction of tannery Clusters linked to CETP in tannery Intensive states

3. Textile wet processing

This report on the Textile (Wet) Processing laid focuss on the following issues:

a) Ascertain the presence of SMEs in the textile sector

b) 'Clustering' of SMEs in the Textile sector

c) SWOT of textile clusters

Background: Textile industryhas the largest employment generation and provide direct employment to 35 million and indirect employment to 50 million people. It contributes 4% of GDP of the country.

Textile wet processing is the critical step as it is associated with customization of the desired textile product, from 'value addition' perspective. Several SPCBs have recognised that the Textile sector, particularly 'wet processing' is highly polluting and categorised this sector as either **RED** or **ORANGE** and in some cases **GREEN** in order of pollution potential of the operations involved.

Textile wet processing operations are highly water intensive, chemical intensive and energy intensive.

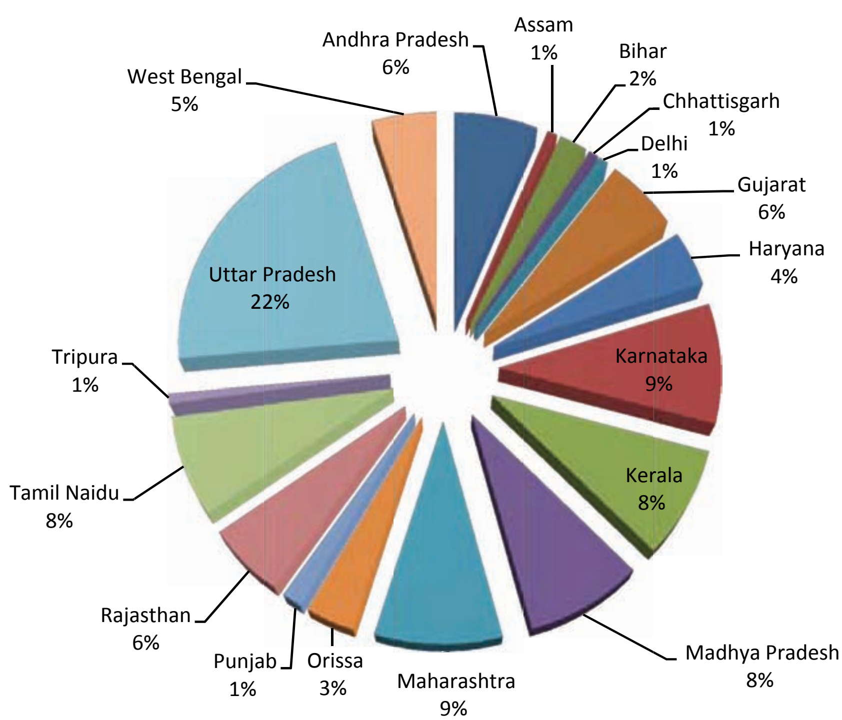


Fig: Share of Textile Clusters in differnt Indian States

Swot of the Textile (WET) Processing SMES Sector

1. STRENGTH of Textile (Wet) processing SMEs Sector

a. Use of alternate environment friendly dyes / chemicals.

b. Application of enzymes.
c. Computer enabled process control methodology in existing machinery.
d. There has been strong R& D in dyeing and finishing activities.
e. Consultative and Collaborative Policy Formulations.
f. The Technology Upgradation Fund Scheme (TUFS) was commissioned to facilitate the modernization and upgradation of the textiles industry.

2. WEAKNESS of Textile (Wet) Processing SMEs Sector

a. Customised improvement in every stage is seldom disclosed
b. Cleaner/good practices are rarely shared by member units within a cluster.
c. Highly water intensive, chemical intensive, energy intensive & highly water polluting too.
d. Lack of energy conservation policy (includes energy audit)
e. Lack of water conservation policy (includes environmental audit)
f. Competition from other textiles producing countries such as China and Pakistan
g. Lack of information regarding procedures for export.
h. The quality of fabrics produced across clusters differs due to quality and fibre use.
i. Small and unorganized units can't harness economies of scale in procurement of raw material.
j. Condition of dyeing and processing in many clusters is in poor shape due to redundant dyeing and bleaching techniques, inadequate technology upgradation, poor yarn quality testing facilities, poor water quality, inadequate water supply and inadequate wastewater treatment facility are some significant issues.
k. There is no mention of initiatives for Operation & Maintenance (O&M) of CETPs, which is an important area in pollution control.

3. OPPORTUNITY in Textile (Wet) processing SMEs Sector

a. Export Promotion.
b. New innovative technologies that are being commercially examined ex. Ultrasound Dyeing, Air Dyeing Technology, Supercritical Fluid Technology, Infra-Red Heating, Plasma Technology and Foam Finish Technology.
c. Market for technical textile is growing.
d. Promotion of 'Integrated' Textile Parks and Mega Clusters.
e. Cluster Development Programme (CDP).
f. Textile Centre Infrastructure Development Scheme.
g. Establishing Common Effluent Treatment Plants (CETPs) in all the Integrated Textile Parks and Mega Clusters.

h. Information dissemination.

i. The Development of National Fibre Policy.

j. Government has acceded to a long standing demand of the industry to do away with excise duty for the cotton and manmade fibre sectors in the FY 2013-2014 budget.

k. Zero excise duty route for cotton and manmade sector at the yarn, fabric and garment stages.

l. 'Restructured' TUFS has been approved with the enhanced 11th Plan allocation under TUFS from Rs. 8000 crore to Rs. 15,404 crore.

4. THREAT in Textile (wet) processing SMEs Sector

a. Environmental threat.

b. Cleaner options in dye usage and dye application are expensive for SMEs.

c. There is a large gap between the availability of skilled manpower and the requirements of the industry, particularly in the weaving, dyeing, processing and garment making segments.

d. The industry is totally de-centralised and in some cases unorganised too.

e. Textiles mills have to much rely on imported machinery for their requirements. Indigenisation of machinery or reduction of customs duty on textile machinery can be a major boost.

f. The growth of the processing units is not proportional to the growth of the sector.

g. Many small sized units don't maintain proper books of account as a result they don't fulfill the accounting requirements of bankers for loans. All these practical problems of small size units deprive them from of availing benefits of scheme like TUFS.

h. Ecological Product requirement for overseas clients.

i. High dependence on supplier activity, low productivity, scarcity of water, low technical expertise in dyeing, lack of expertise in weaving (powerlooms), lack of professional approach in planning and forecasting.

j. Non-availability of adequate fuel for steam generation.

k. Product lead time.

l. Erratic power supply from State Electricity Distribution Companies.

Bilateral Program with Finland Project: "Capacity Building for Emission Measurement in India"

The Joint Working Group on Environment (JWGE) promotes co-operation between India and Finland in field of environment and technology. The JWGE has official delegations from Indian Ministry of Environment & Forests (MoEF) and the Finnish Ministry of the Environment, Govt. of Finland, as well as business delegations from each of the two countries.

It was agreed that VTT Technical Research Centre of Finland, Finish Meteorological Institute (FMI) and Central Pollution Control Board (CPCB) will prepare a Memorandum of Understanding, MoU related to Air Quality.

In the meeting of Joint Working Group on Environment held, in 2009 in Delhi. CPCB presented three proposals for consideration:

1. Advanced odour monitoring & measurement techniques.
2. Cost-effective fugitive emission monitoring systems in organic chemical sector in India.
3. Spontaneous measurement of stack emission monitoring in major industrial sectors in India.

Memorandum of Understanding (MoU) between Central Pollution Control Board in India and VTT Technical Research Centre of Finland from Finland on Project" **CAPACITY BUILDING FOR EMISSION MEASUREMENT IN INDIA"** was signed on 24th day of the August, 2011 envisaging following areas pertaining to industrial sector:

- Improved capacities in odour measurement technologies
- Improved capacities in the measurement of fugitive emissions, especially VOCs, from organic chemical industry
- Improved capacities in emission measurements.
- Constitution of the Project Board: The 1st meating of the Project Board was held on 23rd November, 2011 in Delhi to finalize the project activities of the Project.

A Project Board comprising the following members was constituted.

From VTT Finland

Mr. Jukka Lehtomaki, Technology Manager, VTT

Dr. Tuula Pellikka, Principal Scientist, Team leader, VTT

From CPCB

Mr. J.S. Kamyotra, Member Secretary CPCB

Ms. Mita Sharma, Incharge Coordination Cell, CPCB

Mr. Abhijit Pathak, Air Lab, CPCB

Spatial Environmental Planning Programme

The Spatial Environmental Planning Programme (SEPP) commenced in 1995 for district wise environmental assessment for siting of industries. Under the programme CPCB provided financial support to the participating executing agencies and State Pollution Control Board till March 2009.

The present activities under SEPP are mainly related to completion of pending activities and settlement of accounts. During 2013-14 CPCB has reviewed District Environmental Atlas, Zoning Atlas for Siting of Industries and District Level Industrial Siting Guidelines of Ujjain District. State Environmental Atlas of Uttarakhand State, District Environmental Atlas of Dehradun and Haridwar were also reviewed during this period. Comments/modifications were forwarded for incorporation to MPSPCB and Uttarakhand Environment Protection and Pollution Control Board.

Review meetings with SPCBs of Assam, Bihar, Himachal Pradesh, Madhya Pradesh, Tamil Nadu and Uttarakhand were conducted. The executing agencies were requested to complete all the pending works and utilize the data for planning activities in their respective states. HP SPCB was asked to utilize the fund available with them under the SEP programme for completion of the District Environmental Atlas of seven districts. The HP SPCB has completed the DEA for four districts and submitted for its review to CPCB.

During 2013-2014 advances, released to SPCBs of Karnataka and Maharashtra SPCBs were settled and the unspent balance received from Maharashtra Board were deposited in the CPCB account.

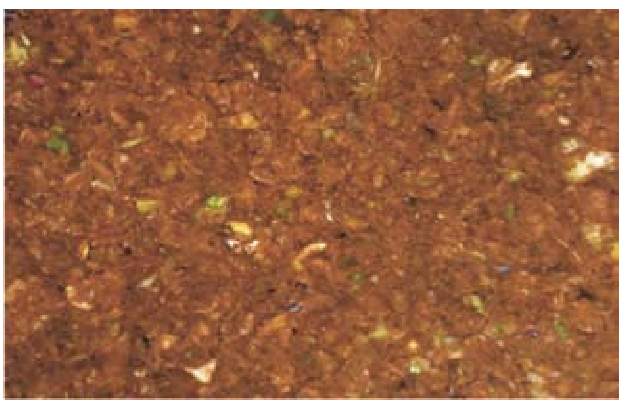
Composting systems for urban households and commercial establishments

The study envisages development of a user friendly, inexpensive and sustainable in-vessel composting technology suitable for Indian conditions for the management of source separated household organics with the main objective to mould a robust vessel model for the in-vessel composting technology. Emphasis was laid on the development of inoculums and design of prototype vessel essential for the development of a state of the art technology which is sustainable and economically viable.

At the end of the study during the current financial year, 129 bacterial cultures were isolated from various waste materials and maintained as stock collection for the preparation of effective composting microbial consortium. Most of the cultures were able to degrade simple carbohydrates (starch), protein (gelatin) and lipids (tween 80) while some of the cultures were positive to pectin degradation but none of the cultures exhibited cellulose and dye degradation capabilities. Cultures which exhibited good hydrolytic properties against 3 to 4 substrates were selected for the formulation of mixed microbial consortium. The performance of microbial consortium was mixed with bulking agent and incorporated with compost feed stock for composting. Composting trials were monitored for 20 days and temperature profiles were recorded. The distinct thermophilic and mesophilic phases were observed in all lab scale composting trials.

For in-vessel composting, a simple, user-friendly, self-sustaining, prototype vessel was designed consisting of cylindrical process drum housed in a fiberglass cylindrical moulding with appropriate insulation in between. The conical top lid consists of a hopper/ shredder attachment for feeding the waste which also doubles up as a vent. The stirrer assembly housing in the top lid connects the external handle (manual operation) to the central stirrer shaft with ribbon-paddle type stirrer blades. The bottom constisction leading to a rectangular opening serves as the outlet for finished product and the sliding perforated plastic plate doubles up as bottom gate and leachate strain. Leachate will be collected below the bottom gate in removable fiberglass housing. The vessel is designed for induced aeration and temperature management without any mechanical blower or fan.

This study is in progress and few more work components has to be designed, including the fabrication of prototype and lab scale validation studies. There is further scope of research on optimization of microbial inoculum, optimization of composting process in the vessel prototype and lab scale in-vessel composting validation studies using the prototype.



Initial compost feed stock

Final composted product after 20 days

There is an increasing trend of Municipal Solid Waste posing serious environmental concerns to Urban Local Bodies (ULBs) and Statutory Authorities. ULBs are not able to manage municipal solid waste under the existing statutes because of various reasons. There is still need of validated/ authenticated database on quantification and characterisation of MSW. The status of waste genrated collected and located in the 03 states of Madhya Pradesh, Chattisgarh and Rajasthan is presented in table.

Table : Status of waste generated, collected & treated:

Name of state	Waste generated (TPD)	Waste Collected (TPD)	Waste treated (TPD)
Madhya Pradesh	4500	2700 (60% of generated waste)	975 (36% of collected waste)

Chhattisgarh	1167	1069 (91.60% of generated waste)	250 (23.38% of collected waste)
Rajasthan	5037	Data Not Available	Data Not Available

From Table it is evident that in Madhya Pradesh only 60% waste is being collected out of which 36% is being treated, while in Chhattisgarh 91.6% waste is collected out of which 23.38% is being treated.

The status of overall compliance of MSW Rules and holistic management of Municipal Solid Waste in most of the cities is not satisfactory. In view of this six cities have been inspected randomly to collect data pertaining to MSW management and gaps have been assessed between generation, collection and treatment is given in Table---.

CPCB has prepared indicative Action Plan/Road Map for Municipal Solid Waste Management which has been provided to all State Pollution Control Boards so that they could formulate the strategy for effective management of MSW.

STPs Indore (KabitKhedi) MP

PHED has constructed two STP's of 78 MLD capacity and 12 MLD based on UASB technology at Khabit Khedi in Indore for sewage treatment of Indore city under NRCP. Performance study of above STPs was carried out by Zonal Office, CPCB, Bhopal on March 28, 2014. The samples were analyzed in the Zonal Office Laboratory. The performance of (78MLD) STP in terms of COD and BOD removal was found 64% and 85% and in case of (12MLD) STP 62% and 77% respectively.

CETP, Balotra:

- There are about 600 industries operational in five industrial areas of Balotra, out of which only 402 industries are members of CETPs. The total flow reported is 40 MLD against treatment capacity of 18 MLD. During visit more than 50 % of effluent was being bypassed from the upstream of Balotra.

- The 6 & 12 MLD CETPs at Balotra are designed on ASP technology. One more CETP of 18 MLD capacity based on SBR technology is under construction in the same premises.
- The percent removal of COD & BOD was found only 29 and 49 % respectively which is on very lower side than the required.
- During the visit sludge was found dumped unscientifically in open areas outside the shed and sludge drying beds (SDBs) not maintained properly.
- The treated effluent is being used in HRTS but the density of plantation found to be inadequate.
- The trust is having 412 KVA DG set which is in operational condition.

CETP, Bithuja:

- Jasol industrial area located 7 KM away from Balotra. is having about 217 operational units which are members of CETP These units are ancillary units to dying and printing units located in Balotra.
- 30 MLD capacity CETP at Bithuja based on waste stabilization technology receives total effluent through pipeline by gravity from all industries.
- The percent removal of COD & BOD was found to be 77% and 89% respectively which is on lower side than required.
- Flow measuring devices are not provided at the inlet and final outlet point to record total quantity of treated effluent.
- The CETP has 75 SDBs (size: 20m X10m each) and one shed for storing the sludge. The sizes of stabilization ponds are 300mX200mX1.5m depth. The CETP has an area of 360 Begha.
- The Trust has not provided DG set for operating the CETP during periods of power failures.

CETP, Jasol:

- Jasol Water Pollution Control and Treatment Trust has established CETP of 2.5 MLD capacity (ASP Technology) in 2005 and one new CETP of 04 MLD (SBR Technology) for treating the wastewater from 69 textile units. All units are members of CETP.
- CETP Jasol receives effluent through pipelines and tankers which is stored in temporary raw effluent holding tank. Treated effluent of CETP is used for plantation purpose and discharged in to river Luni.
- The percent removal of COD & BOD was 69 and 28 % respectively which is on very lower side than required.

- Proper records are not being maintained regarding generation and disposal of sludge.

CETP Jodhpur

- M/s Jodhpur Pradushan Niwaran Trust (JPNT) has installed and is operating a common effluent treatment plant (CETP) of 20 MLD capacity to treat the effluent of industries located in Heavy Industrial Area, Light Industrial Area, Marudhar Industrial Area phase-I &II, of Jodhpur.
- During the inspection approx. 43.87 MLD flow was measured in RIICO drain which is much more than the designed capacity of CETP. Hence untreated effluent was bypassed through the RIICO drain which ultimately terminates into river Jojri. The sludge depth of 50cm was observed in river Jojri at Salawas-Jodhpur road bridge. This can be attributed to the cumulative deposition by regular discharge of untreated effluent.
- The treated water quality of CETP was within the prescribed limit.
- The sludge of CETP is sent to the Secured Land Fill Site (SLF) Gudli, Distt Udaipur and Balotra, Distt. Barmer developed by M/s Ramkey.

1.11 STPs at Jodhpur

- Total treatment capacity of STPs (50MLD the sewaje Salawas and 20 MLD in Nandri) provided in Jodhpur is only 70 MLD against the sewage generation of 160 MLD. About 90 MLD of sewage is discharged into the Jojri river without any treatment. In addition one STP of 50 MLD capacity is proposed.
- The treated water quality of both the STPs was within the prescribed limits.

27 MLD, STP at Jalmahal in Jaipur

- The RUIDP Jaipur has constructed is the 27 MLD STP at Jalmahal which is operated by JMC (Jaipur Municipal Corporation). The Inlet flow of 37 HLD STP was recorded during inspection.
- The STP is based on ASP technology followed by tertiary treatment.
- The percent removal of COD & BOD was 85 and 86 % respectively which is on lower side than the required. The outlet values of pH, BOD, COD and TSS parameters were be within the prescribed limits of discharge.

62.5 MLD (Unit-I & II) STP at Delawas in Jaipur city

- The STP was constructed by RUIDP for treatment of sewage generated from southern part of Jaipur city and further maintained by JMC (Jaipur Municipal Corporation) for operation.

- The STP is based on ASP technology. The inlet flow was found 63 MLD for unit-I and 40MLD for unit-II.
- The percent removal of COD & BOD was 81 and 88 % respectively which is on lower side than required performance.
- The STP has two 500 KVA gas based power generators for running the diffused aeration system and other instruments.

50 MLD, STP at Jaisingh Khor, Jaipur

- New STP of 50 MLD capacity has been installed at Jaisingh Khor based on ASP technology. The STP is receiving less flow as compared to designed capacity.
- Outlet sample were collected for verifying the compliance status of STP. The analysis results of the samples indicate treated water quality is within the prescribed limits.

1.0 MLD STP at Jawahar Circle, Jaipur

- 1.0 MLD STP is located at Jawahar Circle designed with Floating Media Technology. The treated waste water is used for gardening.
- The treated water quality was found within the prescribed standards of discharge.

Assessment of air-borne microbial pollution around Municipal Solid Waste (MSW) management facilities in selected cities of south zone.

Municipal Solid Waste (MSW) handling and management sites invariably generate airborne microbes and its products-bioaerosols. Exposure to airborne microbial has potential health risk to human beings such as respiratory ailments, respiratory inflammation, asthma, bronchitis, dermatologic irritation/ inflammation and allergic alveolitis. In this study, the viable airborne microbial emissions were monitored using portable microbial air sampler based on solid impaction technology.

The study indicated that in open dumps, emissions were relatively less when compared to MSW processing site as it demands more intense handling like segregation, sorting, sieving, tipping, loading, heaping etc. Presence of indicator microorganisms and other opportunistic pathogens is also a clear indication of lacuna in storing and clearing waste in a scientific manner. The main sources of such organisms are faecal matter and urine of warm blooded animals, slaughter house waste, slaughtered animal parts, body fluids of infected animals, sputum/phlegm of infected peoples and biomedical wastes.

The Bioaerosol emission can be reduced by scientific storage and handling of MSW and better storage, fast clearing, efficient processing and minimal handling using automated machineries can bring a sea change of the quantum of biological emissions from MSW can Frequent monitoring bioaerosol in the vicinity of MSW management facilities provide an insight into the airborne biological particle emission and handling.

Monitoring of Operational Sewage Treatment Plants (STPs), Common Effluent Treatment Plants (CETPs), Municipal Solid Waste Management Facilities, Common Bio-medical Waste Treatment Facilities (CBMWTF), Treatment, Storage and Disposal Facilities in South zone

- A Total of 24 STPs located at Chennai, Coimbatore, Vasco-da-gama, Margao&Panaji, Trivandrum, Tiruchirappalli, Pambawere monitored and it was found that 80% of the STPs were complying with norms. Routine maintenance with scientific management was lacking at many places despite having desired treatment units leading to partial non-compliance.
- Performance evaluation study of nine CETPs i.e 5 in Tamil Nadu, 2 in Andhra Pradesh and 2 in Karnataka had been carried out, in which four CETPs at Tamil Nadu are achieving Zero Liquid Discharge (ZLD). The partial compliance is observed due to improper maintenance and un-even hydraulic load on the CETP.
- 21 MSW management facilities at Chennai, Trichy, Madurai, Coimbatore, Kottayam, Sabarimala, Calicut, Kottakal, Panaji, Vasco-da-gama, Cochin, Shimoga and Pondicherry were monitored for verification of compliance of MSW Rules. The improper segregation at source and adoption of suitable technology are the main reasons for partial compliance in many facilities.
- A high level team lead by Dr. K. Kasturirangan visited "Waste to Energy Facility" located at Hyderabad. The officials from Zonal Office Bengaluru accompanied and participated in fruitful discussions. A report was sent to Planning commission.
- Monitoring of three CBMWTFs was carried out at Pondicherry, Bengaluru and Mangalore. The guidelines of CPCB for operation & maintenance of CBMWTFs are not followed, leading to non-compliance
- Two TSDF sites one at Bengaluru and one in Kochi were monitored and both the sites were observed complying with HWM Rules. Compliance of the

Dr. K. Kasturirangan at Waste to Energy Facility, Hyderabad

conditions stipulated by the respective SPCB's in the consent are desired to better compliance.

GIS Portal on Water quality

A database on co-ordinates of 920 industries taken through GPS located in south zone under the project “GIS Portal on Water Quality” was prepared. This will enable spatial temporal distribution of industries and environmental pollutants and in assessing pollution load released into the environment.

ANNEXURE I

DELEGATION OF POWERS BY CENTRAL POLLUTION CONTROL BOARD TO POLLUTION CONTROL COMMITTEES

Sl. No.	Union Territory	Pollution Control Committee	Gazette Notification No. for Power Delegation	Date of Notification
1.	**Andaman & Nicobar Islands**	The Pollution Control Committee Andaman & Nicobar Islands	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 33 Dated 16.01.1992 & Legal /156(4) 1990 dated 3.06.2004	16.01.1992
2.	**Chandigarh**	Chandigarh Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 199(E) dated 15.03.1991 & S.O. 1131 (E) dated 23.10.2002	15.03.1991
3.	**Daman Diu & Dadra Nagar Haveli**	Pollution Control Committee Daman Diu & Dadra Nagar Haveli	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 862 (E) dated 26.11.1992; amended vide notification No. S.O. 384 (E) dated 19.2.1996 and S.O. 698(E) dated 03.07.1998 File No. B-12015/7/04/AS, dated 17.12.2004	26.11.1992
4.	**Delhi**	Delhi Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 198 (E) dated 15.03.1991; amended vide Notification No. S.O. 640 (E) dated14.06.2002	15.03.1991
5.	**Lakshadweep**	Lakshadweep Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No 842 (E) dated 31.08.1988 & legal /156(4) 1990 dated 23.03.2006	31.08.1988
6.	**Puducherry**	Puducherry Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 787 (E) dated 10.03.1992; amended vide Notification No. F.No.Legal/158/(4)/90 dated 01.05.2011	10.03.1992

ANNEXURE-II

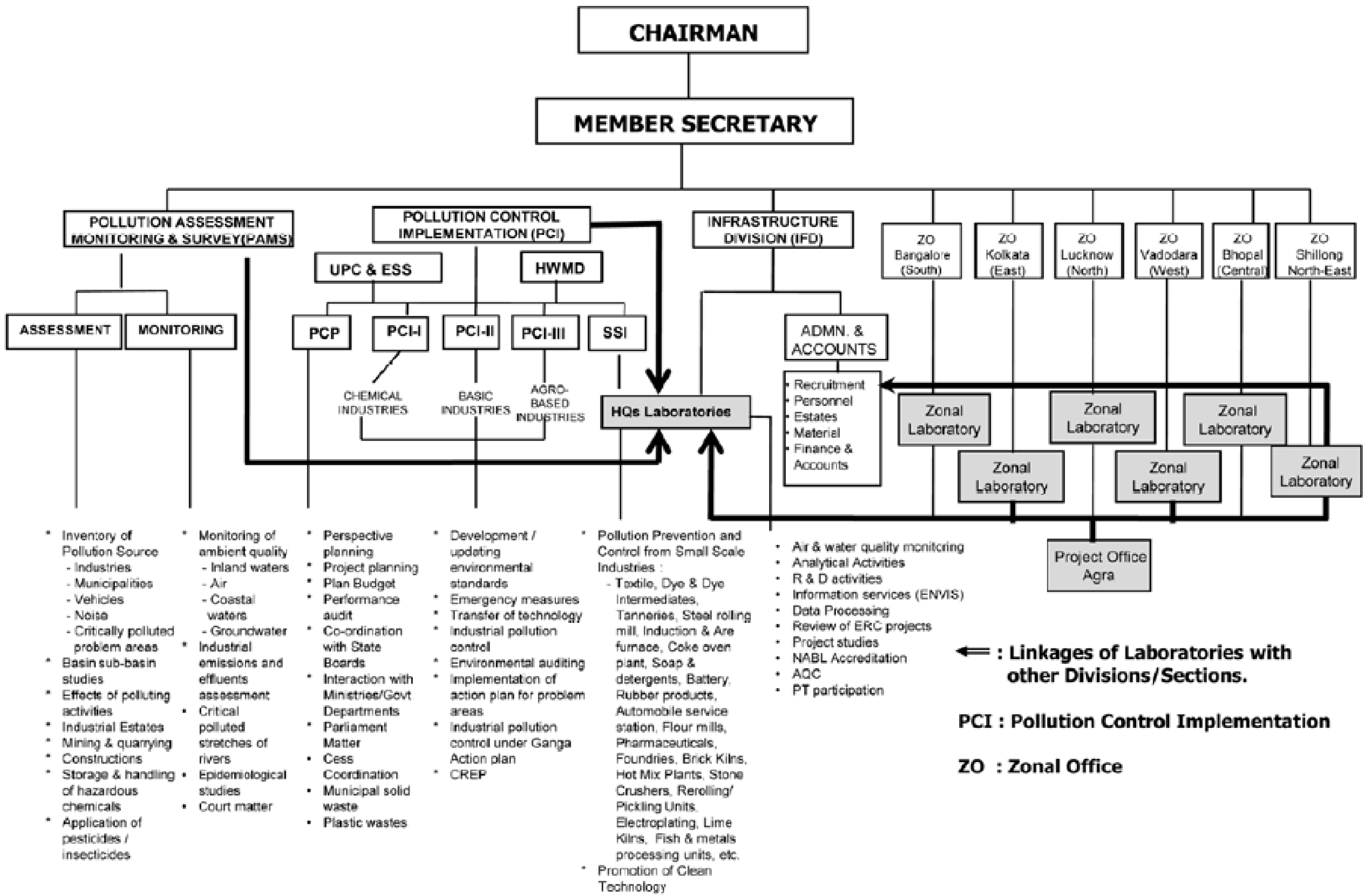
CPCB BOARD MEMBERS
(As on 31.03.2014)

Sl. No.	Name, Designation with Address	Nominated
1.	Shri Susheel Kumar Chairman, Central Pollution Control Board, 'Parivesh Bhavan', East Arjun Nagar, Delhi – 110 032	Chairman
2.	Joint Secretary Ministry of Mines, R.No. 322 "A" Wing, Shastri Bhavan, New Delhi – 110 001	Member
3.	Adviser Ministry of Environment & Forests (Handling Water Quality Monitoring Works) 'Paryavaran Bhavan', C.G.O.Complex, Lodi Road, New Delhi – 110 003	Member
4.	Joint Secretary (CP) Ministry of Environment & Forests 'Paryavaran Bhavan', C.G.O.Complex, Lodi Road, New Delhi – 110 003	Member
5.	Joint Secretary (Refineries) Ministry of Petroleum and Natural Gas, Shastri Bhawan, Dr. Rajender Pd. Road, New Delhi - 110 001	Member
6.	Additional Secretary and Financial Adviser Ministry of Environment & Forests 'Paryavaran Bhavan', C.G.O.Complex, Lodi Road, New Delhi – 110 003	Member
7.	Chairman, Haryana State Pollution Control Board, C-11, Sector – 6, Panchkula (HARYANA)	Member
8.	Chairman, Bihar State Pollution Control Board, Beltron Bhavan, IInd floor, Jawaharlal Nehru Marg, Shastri Nagar, Patna 800023, Bihar.	Member

Sl. No.	Name, Designation with Address	Nominated
9.	Chairman, Maharashtra Pollution Control Board, Kalpataru Points, 3-4th floors, Sion Matunga Schem Rd.No.6, Opp. Cine Planet, Sion Circle Sion (E), Mumbai-400 022.	Member
10.	Smt. Abhilasha Gupta Mayor 287, Bahadur Ganj Allahabad – 211 003	Member
11.	Chairman, Tamil Nadu Pollution Control Board, No. 76, Mount Salai, Guindy, Chennai- 600 032.	Member
12.	Dr. A.B. Akolkar Member Secretary Central Pollution Control Board 'Parivesh Bhavan', East Arjun Nagar Delhi – 110 032	Member Secretary

ANNEXURE-III

ORGANISATION STRUCTURE OF CENTRAL POLLUTION CONTROL BOARD



ANNEXURE – IV

SANCTIONED STAFF STRENGTH IN CPCB AND NUMBER OF VACANCIES IN EACH CADRE AS ON 31.03.2013

Sl. No.	Name of the Post	Sancti-oned	Filled			Deemed abolished/ approval for revival awaited	Abolished by MoEF
			Regular/ Dep.	Ad-hoc	Vacant		
Total number of scientific posts at the time of induction of the Flexible Complementing Scheme (Interchangeable)							
1	Scientist 'F' - 02	168	2	-	25	-	-
2	Scientist 'E' - 08		7	-		-	-
3	Scientist 'D' - 22		45	-		-	-
4	Scientsit 'C' - 60		36	-		-	-
5	Scientist 'B' - 76		52	-		1	-
6	Senior Law Officer	1	1	-	-	-	-
7	Finance & Account Officer	1	-	-	1	-	-
8	Sr. Administrative Officer	1	1	-	-	-	-
9	Administrative Officer	7	6	-	1	-	-
10	Law Officer	2	2	-	-	-	-
11	Assistant Law Officer	2	1	-	1	-	-
12	Hindi Officer	1	1	-	-	-	-
13	Accounts Officer	2	2	-	-	-	-
14	Assistant Accounts Officer	5	5	-	-	-	-
15	Assistant Technical Officer	1	-	-	1	-	-
16	Section Officer	10	8	-	2	-	-
17	Private Secretary	20	18	-	2	-	-
18	Senior Technical Supervisor	9	8	-	1	-	-
19	Draughting Supervisor	1	1	-	-	-	-
20	Deputy Librarian	1	-	-	-	1	-
21	Senior Scientific Assistant	35	30	-	4	-	-
22	Senior Hindi Translator	1	1	-	-	-	-
23	Technical Supervisor	10	2	-	8	-	-
24	Assistant	19	16	-	3	-	-
25	Data Processing Assistant	4	-	1	3	-	-
26	Senior Draughtsman	2	2	-	-	-	-
27	Junior Engineer (E & M)	1	1	-	-	-	-
28	Junior Engineer (Civil)	1	-	-	1	-	-

Sl. No.	Name of the Post	Sancti-oned	Filled			Deemed abolished/ approval for revival awaited	Abolished by MoEF
			Regular/ Dep.	Ad-hoc	Vacant		
Total number of scientific posts at the time of induction of the Flexible Complementing Scheme (Interchangeable)							
29	Personal Assistant	1	1	-	-	-	-
30	Accounts Assistant	8	8	-	-	-	-
31	Junior Hindi Translator	1	-	-	1	-	-
32	Publication Assistant	1	1	-	-	-	-
33	Junior Scientific Assistant	35	27	1	1	-	6
34	Senior Technician	12	8	-	-	-	4
35	Junior Technician	7	7	-	-	-	-
36	Senior Laboratory Assistant	32	28	-	1	-	3
37	Junior Laboratory Assistant	38	26	-	5	-	7
38	Field Attendant	7	7	-	-	-	-
39	Upper Division Clerk	24	21	-	-	-	-
40	Lower Division Clerk	35	15	-	5	13	2
41	Senior Attendant	15	15	-	-	-	-
42	Driver Special Grade	1	1	-	-	-	-
43	Driver Grade-I	7	7	-	-	-	-
44	Driver Grade-II	6	1	-	5	-	-
45	Driver (Ordinary)	8	6	-	2	-	-
46	Data Entry Operator Grade-I	2	1	-	1	-	-
47	Data Entry Operator Grade-II	8	6	-	-	-	2
48	Junior Draftsman	1	-	-	-	1	-
49	Stenographer	10	3	-	-	5	2
50	Cashier	6	-	-	-	6	-
51	Pump & Wheel Valve Operator	2	1	-	-	-	1
52	Plumber	1	1	-	-	-	-
53	Attendant	39	22	-	-	8	9
	Total	**612**	**464**	**2**	**74**	**35**	**37**

- *02 posts of Scientist D (one Sr. Env. Engineer and one Sr. Scientist Sl. No. 3), These 02 posts are indicated in the168 posts covered under FCS -Sl check. (Sl. No. 5), 02 posts of Senior Scientific Assistant (Sl. No. 21) and 02 posts of Junior Scientific Assistant (Sl. No. 33) are sanctioned under HWMD for which approval for continuation is awaited.*
- *One post of Assistant Technical Officer (Sl.No. 15) is sanctioned, however approval for Recruitment Rules are still awaited.*
- *Five post of Sr. Technician are abolished by MoEF, however, one post is filled up due to exigency of work. (Sl. No. 34).*

ANNEXURE – V

POST CREATED BY THE CENTRAL POLLUTION CONTROL BOARD AFTER THE NOTIFICATION OF CPCB REGULATIONS, 1995 AND FOR WHICH CONCURRENCE OF GOVERNMENT IS AWAITED.

Sl. No.	Name of the post	Approved by the CPCB	Filled		Unfilled
			Regular/Dep.	Ad-hoc	
1	Assistant Law Officer	1	-	-	1
2	Sr. Hindi Officer	1	-	-	1
3	Accounts Assistant	6	-	-	6
4	Senior Hindi Translator	1	-	-	1
5	Junior Hindi Translator	7	-	-	7
6	Hindi Typist (LDC)	7	-	-	7
7	Driver Grade II	3	-	-	3
8	Attendant (Safaiwala)	10	-	8	2
9	Field Attendant	11	-	-	11
Total		**47**	**0**	**8**	**39**

ANNXURE VII

THE ENVIRONMENTAL LABORATORIES OF GOVT. / PUBLIC SECTOR UNDERTAKINGS/ EDUCATIONAL INSTITUTES / STATE OR CENTRAL POLLUTION CONTROL BOARD RECOGNISED UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986.

S. No	Name of laboratory	Gazette notification no. and date	Validity upto
1.	Central Laboratory Central Pollution Control Board Parivesh Bhawan East Arjun Nagar **Delhi-110032**	Legal 42(3)/87 dated 1st October, 2009	30st September, 2014
2.	Central Laboratory Punjab Pollution Control Board Vatavaran Bhawan, **Patiala, -147001** Punjab	Legal 42(3)/87 dated 15th January , 2010	14th January, 2015
3.	Regional Laboratory Maharashtra Pollution Control Board Jog Centre , 3rd Floor, Pune- Mumbai Road, Shivaji Nagar, **Pune-411003** Maharashtra	Legal 42(3)/87 dated 15th January , 2010	14th January, 2015
4.	Zonal Laboratory Central Pollution Control Board, Zonal Office , Kolkata 502, Southend Conclave, 1582 Rajdanga Main Road **Kolkata – 700107**	Legal 42(3)/87 dated 15th January , 2010	14th January, 2015
5.	Environment Protection Training and Research Institute (EPTRI), 91/4, Gachi Bowli, **Hyderabad- 500032** Andhra Pradesh	Legal 42(3)/87 dated 20th September, 2010	19th September, 2015
6.	P.G. Department of Environment Management Chhatrapati Shahu Institute of Business Education and Research (SIBER), University Road, **Kolhapur- 416004** Maharashtra	Legal 42(3)/87 dated 20th September, 2010	19th September, 2015

S. No	Name of laboratory	Gazette notification no. and date	Validity upto
7.	Punjab Bio- Technology Incubator Agri. And Food, testing Laboratory SCO: 7 & 8 (Top Floor), Phase-V,SAS Nagar, **Mohali-160059** Punjab.	Legal 42(3)/87 dated 20th September, 2010	19th September, 2015
8.	Regional Laboratory Maharashtra State Pollution Control Board 6th Floor, "Udyog Bhawan" Civil Lines **Nagpur-440001** Maharashtra	Legal 42(3)/87 dated 27th January, 2011	26th January, 2016
9.	Regional Laboratory Maharashtra State Pollution Control Board 1st Floor, Udyog Bhawan, Rathi Chowk, Trimbak Road **Nashik-422007** Maharashtra	Legal 42(3)/87 dated 27th January, 2011	26th January, 2016
10.	Regional Laboratory Maharashtra State Pollution Control Board "Paryavaran Bhavan" A-4/1, Chikalthana MIDC, Behind Dhoot Hospital, **Aurangabad- 431210** Maharashtra	Legal 42(3)/87 dated 27th January, 2011	26th January, 2016