CPCB NEWS LETTER

CENTRAL POLLUTION CONTROL BOARD

VOLUME: 2 JANUARY 1989 No.

Season's Greetings

&

Happy New Year

Shri Paritosh C. Tyagi, Chairman, Central Board and Prof. P. Khanna (NEERI) signing the MOU

CPCB signs MOU with CSIR

The Council of Scientific and Industrial Research (CSIR) and the Central Pollution Control Board signed a memorandum of understanding on 4th Nov., 1988. The MOU was signed in the presence of Dr. A.P. Mitra, Director General, CSIR by Shri Paritosh C. Tyagi, Chairman, Central Pollution Control Board on behalf of the Board and Prof. P. Khanna, Director, National Environmental Engineering Research Institute, Nagpur, on behalf of the CSIR.

The memorandum provides for collaborative research and development work in the areas of Industrial Pollution Control, Water and Air Quality Monitoring and Industrial Effluent Monitoring. The memorandum of understanding will be valid for a period of five years. The National Environment Engineering Research

Institute, Nagpur, a CSIR unit will be the executing counterpart agency on behalf of the CSIR. At present the following important areas have been identified for cooperation between CSIR and the Central Board.

Air Quality Monitoring Studies on chemical forms, physical/chemical transformation of toxic pollutants and receptor - receptor modelling approach.

Studies on Environmental Assimilative Capacities in select location to enable objective site selection for industries in delineated land use plans.

Studies on Low/Non Polluting Technologies in select industrial sectors.

Development of Management Information System for Water and Air Polluting Industries.

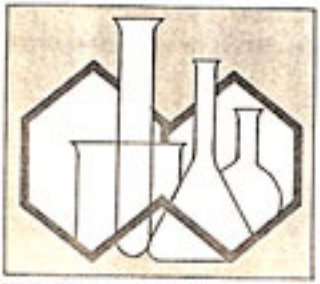
Development of Rapid BOD, Bacteriological and Virological tests.

Development of Rapid Bioassay Tests to ascertain toxicity of wastes using microflora and fauna.

Demonstration of PACT (Powdered Activated Carbon Treatment) process for Treatment of Toxic and Recalcitrant Organic Chemical Industry Wastewater - Pilot Plant Study.

Development and Demonstration of Thermal and Chemical methods of treatment for Hazardous Wastes.

COMMISSIONING OF THREE NEW INSTRUMENTS IN THE INSTRUMENTATION LAB OF THE CENTRAL BOARD



High Pressure Liquid Chromatograph

'KNAUER' HPLC has been installed and brought into operation in October 1988. This instrument is useful in analysing a wide spectrum of parameters such as phenols, pesticides etc., and requires simple sample pretreatment compared to the treatment for GLC analysis. Standardisation of this instrument for the analysis of parameters which are possible with the available columns, is in progress.

ION Chromatograph

BIOTRONIK (3000) Ion Chromatograph has been installed recently. The instrument requires continuous flow of 'Nanograde' water, through the system, and using suitable eluents it is possible to analyse several cations and anions simultaneously without treatment for colour generation or such processings required in Spectrophotometric analysis.

Atomic Absorption Spectrophotometer With Graphite Furnace.

Varian (Spectra 21) AAS with 'Graphite Tube Atomiser (GTA)' and 'Hydride Generation' attachments has also been commissioned this year. This system required a cooling water supply with minimum 25 psi. pressure and minimum 1.5 litres/minute flow with a maximum tolerable temperature of 40°C.

For this, recirculation system was devised indigenously. The system developed involves supply of cooling water to the graphite tube atomiser from a storage tank kept in the laboratory, with the help of a small pump. Water drained from the graphite tube is pumped back into the storage tank. The natural cooling of the water in the storage tank was found adequate to compensate temperature increase.

TWO DAY EXPOSURE PROGRAMME ON STREAM WATER QUALITY MODELLING CONDUCTED BY CESE, IIT, BOMBAY

Centre for Environmental Science and Engineering (CESE), Indian Institute of Technology, Bombay organized an Exposure Programme on Stream Water Quality Modelling at Hyderabad between October 31 - November 1, 1988. This programme at the initiative of Mr. Paritosh C. Tyagi, Chairman, Central Pollution Control Board, was conducted at the Environmental Protection Training Institute of the Andhra Pradesh Pollution Control Board. The programme was fourth of its kind conducted by CESE as a complementary activity to the on-going sponsored project on Water Quality Modelling from Ganga Project Directorate, Ministry of Environment and Forests, New Delhi.

Chairmen and Member Secretaries of various State Pollution Control Boards and Senior level officers from different Water Supply and Sewerage Boards participated in the programme.

Mr. V.P. Ramarao, Secretary, Department of Environment, Andhra Pradesh and Chairman, Andhra Pradesh Pollution Control Board inaugurated the programme. Mr. Paritosh C. Tyagi, Chairman, Central Pollution Control Board delivered the opening remarks giving a background of the Programme, defining its objectives and usefulness, especially in the context of Pollution Control Boards. Mr. Y.S. Murthy, Member Secretary, Andhra Pradesh Pollution Control Board highlighted the activities of Environmental Protection Training Institute.

Professor C. Natarajan, Head CESE, IIT Bombay gave an overview of the genesis of the training programmes and Dr. P.M. Modak, Programme Coordinator, CESE described the scope of the Exposure Programme.

The two day programme consisted of four lecture sessions, focussing on the principles and field applications of stream water quality modelling, stressing both potentials as well as limitations. A special session was arranged of two hours on the hands-on utilization of the software on Water Quality Modelling to benefit the delegates. In this hands-on session, the delegates worked on the STREAM-I (one dimensional complete mix DO-BOD model) and STREAM-II (two dimensional complete mix DO-BOD model with transverse dispersion) packages developed at CESE, IIT Bombay using the IBM-PCs made available by the Andhra Pradesh Pollution Control Board. All the delegates were given a comprehensive set of lecture notes, an IBM-PC compatible floppy of STREAM-I including a text file of the manual. In the end, a discussion session was conducted by Prof. C. Natarajan where the delegates expressed their views with respect to the applicability of water quality models in managing stream water quality. Mr. Paritosh C. Tyagi, Chairman, Central Pollution Control Board, provided an overview of the activities in the Ganga Project Directorate and summed up the discussions identifying areas which could be taken up by Pollution Control Boards and institutions like CESE, IIT, Bombay.

As a continuing activity, CESE, IIT Bombay shall be organizing an Advanced Programme on Stream Water Quality Modelling at IIT between January 30-February 3, 1989. For details, Dr. P.M. Modak, Assistant Professor, Centre for Environmental Science and Engineering, Indian Institute of Technology, Powai, Bombay-400 076, may be contacted.

WORLD HEALTH ORGANISATION (WHO) SPONSORED GROUP EDUCATION TOUR TO INDUSTRIES.

With the basic objective to provide exposure to the middle level officers of the Central and State Boards, to different types of industries and sources of pollution in different states of the country, the Central Board organised study tours in the years 1987 and 1988 and

proposes to continue this tour in future.

The first group education tour was organised from October 26 to December 3, 1987. A total of 14 participants from Central and 11 State Boards took part in the programme. The exposure provided first hand opportunity to assess the status and extent of prevailing pollution level and the control measures being taken by the concerned organisations. They visited 36 industries and institutions.

The types of industries visited were ferrous and non-ferrous metallurgical industries, refineries, oil drilling sites, pesticides and thermal power plants. Special attention was given to domestic and industrial wastewater treatment plants.

Participants have expressed that they gained substantial knowledge in terms of pollution problems from different types of industries, identification of pollution prone areas in the country, new techniques for pollution control, operation and maintenance of control unit and process control.

The second programme started from 14th November and concluded on 15th December, 1988. The number of participants for the year 1988 was 16, apart from two coordinators from the Central Board. Participants were given first hand information regarding the industries to be visited to prepare themselves prior to the visit. A guideline was also evolved and given to the participants featuring major points to be looked into in details during the inspection. The participants visited 28 industries and institutions.

STUDY TO EVALUATE USE OF ETHANOL FOR THE EXTRACTION OF CHLOROPHYLL FROM SURFACE WATER SAMPLES

Chlorophyll contents of water is a measure of the extent of trophication of the water body. A correct estimation of the chlorophyll content is therefore essential before any control measures are taken. The method of chlorophyll estimation presently used in India involves use of acetone as the solvent for chlorophyll extraction from aqueous samples. This however has been reported to be efficient only in case of marine samples. Use of ethanol on the other hand has been reported to be more efficient for chlorophyll extraction from surface fresh water samples. This variation is probably because of the different osmotic properties of the chlorophyll cell/water system, depending upon the salinity of the water system. A study has therefore been initiated in the Biosciences laboratories of the CPCB for making a relative comparison of these two alternate solvents using Yamuna water samples.

STUDY TO COLLECT AND REVIEW INFORMATION ON CERTAIN ANALYTICAL INSTRUMENTS.

Sophisticated analytical instruments such as AAS, GLC etc. are gradually becoming essential for the laboratories of the Pollution Control Boards. Being very expensive items, expected to perform important tasks, these require special attention to be given at the time of selection. It is essential to

select suitable make and model to suit the analytical requirements. Specifications of some of these instruments have been drawn. However, a review of the analytical requirements depending upon the existing/anticipated limits of detection of various pollutants, various options available and their respective performance etc. will be very useful to make optimum choice of the instruments. Keeping this in view, a three months study has been initiated in the Instrumentation Laboratory of the Central Pollution Control Board to collect/review the available literature/information and options available, for the four priority instruments namely AAS, GLC, TOC and UV/visible spectrophotometer.

MONITORING PERFORMANCE OF TREATMENT PLANTS THROUGH TOC ANALYSIS

Phase separation (UK) make TOC Sin II Aqueous Carbon Analyser has been commissioned in the instrumentation laboratory of the Central Pollution Control Board. It is being used for the analysis of carbon (Total,

Inorganic and organic i.e. TC, TIC and TOC) in aqueous samples. TOC can be used in lieu of BOD and COD in cases where significant correlation exists between these parameters. It is therefore possible to cut down not only the analysis load but also the analysis time, as the BOD/COD analysis is time consuming. In order to establish the correlation for the influent and effluent from treatment plants, three different types of industries have been taken up. The three industrial categories are:

- Food and Fertilizer industry
- Dairy
- Textile Industry

MONITORING OF PONDICHERRY COAST

In order to assess coastal water quality of Pondicherry Beach, Union Territory office of the Central Board undertook the monitoring work from 1983. The aim of the monitoring was to plan a programme which will help in understanding the cause and nature of environmental degradation associated with coastal zone development and evolving means to mitigate such environmental degradations. For monitoring, five stations were selected based on the activities on the coast e.g. sewage disposal, industrial effluent disposal and recreational activities. Samples collected regularly were analysed for various chemical and biological parameters. On the basis of two years data available, it is seen that though water quality has not changed much for analysed chemical parameters, bacteriologically the beach water is degrading.

WHO has prescribed standard for beach waters for coliform as 1000/100 ml. Based on the observations where higher values were recorded, the Central Board has advised the Government of Pondicherry to take steps whereby all sewage discharges be diverted and treated at one place. Presently the Central Board is carrying further studies to identify pathogenic organisms, such as E. coli, Salmonella, Shigella and Vibrios in the coastal waters.

FAI ENVIRONMENT PROTECTION AWARD

New Fertilizer plants are adopting latest technologies for monitoring and prevention of pollution. The existing plants have no option but to optimise process parameters to minimise pollution and adopt suitable control measures to control pollution.

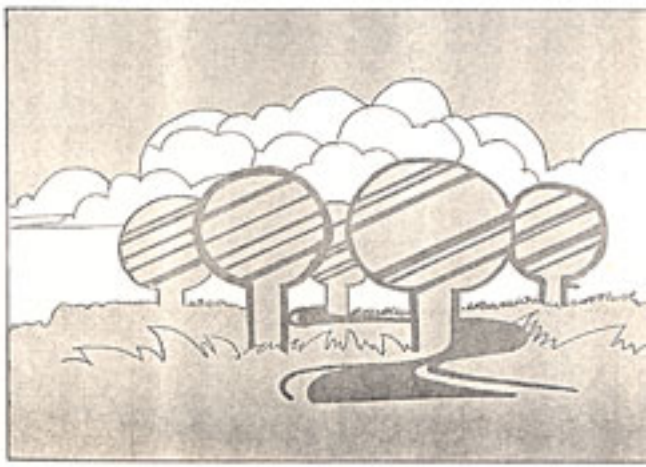
The industry on its part has intensified its efforts to meet the legal requirements and social responsibility of safeguarding the quality of environment we live in. To encourage company efforts in controlling pollution and to recognise the achievements, Fertiliser Association of India instituted 'Environment Protection Award' from the current year. Three Awards in the form of plaque have been instituted; one each for Nitrogenous fertilizer plants, Complex (P_2O_5) fertilizer plants and Single Superphosphate plants.

The keen interest shown by the industry is evident from the overwhelming response received. The entries were evaluated by a Committee, and the following plants were selected for the awards.

Gujarat Narmada Valley Co Ltd., Bharuch, for Nitrogenou fertilizer plant.

Hindustan Lever Ltd., Haldia for Complex (P_2O_5) fertiliser plant

Agro-Chem Punjab, Chandigarh for Single Superphosphate Plant



महानगरों में वाहन जनित प्रदूषण का अध्ययन

दस लाख या उससे ज्यादा जनसंख्या वाले शहरों को "महानगर" कहा जाता है। 1981 की जनगणना के अनुसार हमारे देश में कुल बारह महानगर हैं, और अनुमान है कि सन् 1991 तक इनकी संख्या 23 हो जाएगी (चित्र 1)।

यातायात और आवागमन के लिए मुख्य रूप से पेट्रोल और डीजल से चलने वाले वाहनों का प्रयोग होता है। विभिन्न कारणों से जैसे लोगों का जीवन-स्तर सुधरने, शहरों में व्यापार, वाणिज्य और उद्योगों के फैलने, शहरों के अनियोजित विस्तार तथा विभिन्न प्रकार के वाहनों के आसानी से उपलब्ध होने के कारण महानगरों में वाहनों की संख्या में काफी वृद्धि हुई है। सामूहिक यातायात व्यवस्था के बढ़ती हुई जनसंख्या की आवश्यकता को पूरा करने में असमर्थ होने के कारण व्यक्तिगत वाहनों की संख्या बहुत तेजी से बढ़ी है। देश की कुल जनसंख्या का 6 प्रतिशत और कुल पंजीकृत वाहनों का 35 प्रतिशत महानगरों में विद्यमान है।

विकसित देशों की तुलना में अभी भी हमारे देश में वाहनों की संख्या बहुत कम है परन्तु कुछ महानगरों में वाहन जनित वायु प्रदूषण का प्रभाव स्पष्ट रूप से प्रदर्शित होने लगा है। दिन-प्रतिदिन बढ़ते जा रहे वायु प्रदूषण को ध्यान में रखते हुए केन्द्रीय प्रदूषण नियंत्रण बोर्ड ने महानगरों में वाहन जनित प्रदूषण से संबंधित अध्ययन किया जिसके मुख्य उद्देश्य निम्नलिखित है:-

(क)महानगरों में प्रदूषण के स्तर का पता करना

(ख)वाहन जनित प्रदूषण की समस्या से ग्रस्त क्षेत्रों का पता लगाना

(ग)वाहन जनित प्रदूषण के नियंत्रण और उसे न्यूनतम स्तर तक लाने के लिए एक कार्य योजना की रूपरेखा तैयार करना।

अध्ययन के दौरान प्रश्नावली के माध्यम से दो तीन और चार पहिया वाहनों का सर्वेक्षण किया गया। ट्रक, बस और सामान ढोने वाले वाहनों के बारे में विभिन्न संबंधित संस्थाओं से पूछताछ की गई। सर्वेक्षण से यह पता लगाया गया कि साधारण तौर पर अलग-अलग वर्ग के वाहन, विभिन्न महानगरों में प्रतिदिन कितनी दूरी तय करते हैं। विभिन्न महानगरों के कुछ कार्यालयों, जैसे यातायात और साक्षियकी विभाग से उस शहर में पंजीकृत विभिन्न श्रेणी के कुल वाहनों की संख्या भी प्राप्त की गई। विश्व स्वास्थ्य संगठन के विभिन्न प्रकार के वाहनों के प्रतिहजार किलोमीटर चलने से उत्पन्न हुए प्रदूषणकारी तत्वों की मात्रा का अनुमान लगाया गया। वाहन जनित प्रदूषण के संदर्भ में क्रम से पांच महानगर हैं - दिल्ली, बम्बई, बंगलौर, कलकत्ता और अहमदाबाद। डीजल से चलने वाले वाहनों की अपेक्षा पेट्रोल से चलने वाले वाहन ज्यादा प्रदूषण उत्पन्न करते हैं।

महानगरों में वाहनों से उत्पन्न होने वाले धुंओं में 64% कार्बन मोनोक्साईड, 22% हाइड्रोकार्बन और 12% नाईट्रोजन के आक्साईड होते हैं। सारे महानगरों में संयुक्त रूप से 31.3.1987 तक 39,04,030 वाहन थे (चित्र 2) इनसे प्रतिदिन 2997.65 टन प्रदूषणकारी तत्व उत्सर्जित होते हैं। सारणी-1 अनुमान है कि सन् 1991 में कर्नाटक महानगरों में 72,19,233 वाहन 4162.11 टन दूषक पदार्थ प्रतिदिन उत्सर्जित करेंगे।

गाड़ियों के रखरखाव तथा सड़क तथा यातायात की व्यवस्था का ठीक न होना व्यापारिक केन्द्रों का शहर के बीचों-बीच रहना तथा ऊंचे भवनों के कारण धुंए का पूरी तरह न फैल पाना भी वाहन जनित प्रदूषण के स्तर बढ़ाते हैं। अन्तर्राष्ट्रीय स्तर के अनुसार महानगरों में सड़कों का क्षेत्र कुल क्षेत्र का तीस प्रतिशत या उससे ज्यादा होना चाहिए जबकि भारत के महानगरों में बंगलौर में सबसे ज्यादा 17 प्रतिशत भाग में और कलकत्ता में सबसे कम 6 प्रतिशत हिस्से में सड़कें है।

इस अध्ययन के बाद वाहनों से उत्पन्न होने वाले प्रदूषण को निम्नतम स्तर तक लाने के लि कुछ सुझाव निम्नलिखित हैं-

(क) मुख्य व्यापारिक केन्द्र तथा कार्यालयों को शहर के बीचों बीच स्थापित करने के बा इन्हें कई भागों में बांटकर शहर के बाह हिस्से में ले जाना चाहिए।

(ख) सामूहिक यातायात व्यवस्था को सक्षम बनाया जाए जिससे लोगों को व्यक्तिगत वाहन का प्रयोग करने की कम से कम आवश्यकता हो।

(ग) सड़कों का उचित रख रखाव होना चाहि तथा यातायात व्यवस्था नियंत्रित होनी चाहिए।

(घ) लोगों को प्रदूषण से संबंधित पूरी जानका देनी चाहिए।

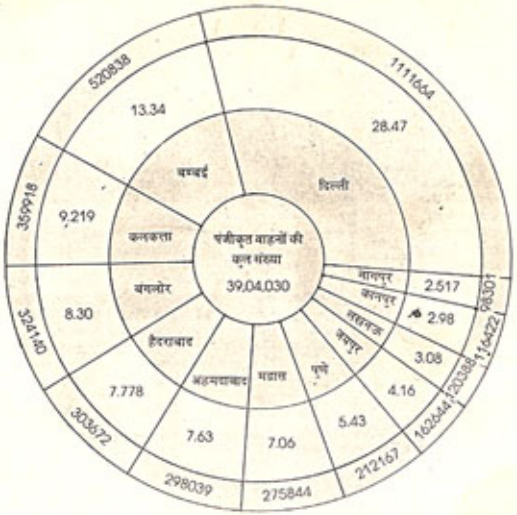
(ङ) भारतीय स्थिति को ध्यान में रखते हुए वाहनों से धुएं के उत्सर्जन की सीमा निश्चित की जाए तथा अनुज की मदद इनका पूरी तरह से पालन किया जाना चाहिए।

चित्र 1 : भारत में महानगरों की स्थिति

● 1981 की जनगणना के आधार पर महानगर
▲ 1991 में सम्भावित महानगर

सारणी 1 : महानगरों में अनुमानित वाहनों द्वारा उत्पन्न प्रदूषण
(31 मार्च, 1987 तक पंजीकृत वाहनों की संख्या के आधार पर)

क्रम संख्या	महानगर का नाम	वाहनों द्वारा उत्सर्जित प्रदूषणकारी तत्व (टन प्रतिदिन)					
		अवलम्बित कण	सल्फर डाय आक्साईड	हाइड्रोजन के आक्साईड	हाइड्रो कार्बन	कार्बन मोनोआक्साईड	योग
1.	दिल्ली	8.58	7.47	105.38	207.98	542.51	871.92
2.	बम्बई	4.66	3.36	59.02	90.17	391.60	548.81
3.	बंगलौर	2.18	1.47	21.85	65.42	162.80	253.72
4.	कलकत्ता	2.71	3.04	45.58	36.57	156.87	244.77
5.	अहमदाबाद	2.46	2.41	33.33	56.46	149.28	243.94
6.	पूने	1.99	1.07	13.50	61.00	135.20	212.76
7.	मद्रास	1.95	1.68	23.51	42.05	119.35	188.54
8.	हैदराबाद	1.62	1.30	14.03	46.94	105.14	169.03
9.	जयपुर	0.98	1.04	12.74	17.49	42.73	74.98
10.	कानपुर	0.88	0.90	11.14	18.53	40.35	71.80
11.	लखनऊ	0.95	0.79	8.07	18.75	41.02	69.58
12.	नागपुर	0.46	0.34	4.24	13.60	29.16	47.80
	कुल योग	29.42	24.87	352.39	674.96	1916.01	2997.65



चित्र 2

विभिन्न महानगरों में पंजीकृत वाहनों की संख्या (1986-87)
बाहर के कुल में महानगर में पंजीकृत वाहनों की कुल संख्या
तथा दूसरे कुल में सारे महानगरों में वाहनों का प्रतिशत निर्दिष्ट है

Issued by: Public Relations Cell; Central Pollution Control Board;
5th & 6th Floors, Skylark; 60, Nehru Place; New Delhi-110 019.