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**Final Report**

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**Pilot Testing of Guidance for the Review  
and Updating of National Implementation  
Plan in India**

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*Sponsored by  
Secretariat of Stockholm Convention, Geneva  
under  
Small Scale Funding Agreement*



**(CSIR - NEERI)**



**CSIR-National Environmental Engineering Research Institute  
(CSIR-NEERI), Nehru Marg, Nagpur – 440020**



**Stockholm Convention Regional Centre  
on POPs for Asia**

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**July, 2012**

- 1.0 Title of the Project** : Pilot testing of guidance for the review and updating of National Implementation Plan in India
- 2.0 Date of Start** : April, 2012
- 3.0 Project Coordinator** : Dr. S. R. Wate, Director, CSIR-NEERI, Nagpur – 440020
- 4.0 Project Leader** : Dr. Asha A. Juwarkar, Chief Scientist & Head, Eco-System Division, CSIR-NEERI, Nehru Marg, Nagpur – 440020
- 5.0 Team Members** : Dr. P. L. Muthal, Dr. N. P. Thacker, Dr. A. N. Vaidya, Mr. G. S. Kanade, Mr. S. K. Singh, Mr. S. M. Kashyap, Dr. Kanchan Kumari, Dr. Kavita Gandhi, Mr. R. Karthik, Mrs. Rashmi R. Misra Mr. Jitendra K. Sharma

## **6.0 Introduction**

CSIR-NEERI was nominated as Stockholm Convention Regional Centre (SCRC) on POPs for Asia region in September, 2010 and has been endorsed as the Regional Centre for Capacity Building and Technology Transfer for Asia Region at COP-5 meeting held at Geneva, during April 25 – 29, 2011.

The main objective of SCRC is to serve different parties/countries in the Asia region in their capacity building, transfer of technologies related to persistent organic pollutants (POPs) and new POPs, raise awareness and promote environmentally sound management (ESM) of POPs and POPs contaminated sites in the region. The centre will also assist the parties of Asia region in fulfilling their obligations of the Stockholm Convention.

## 7.0 Background of the Project

The project entitled “*Pilot testing of guidance for the review and updating of National Implementation Plan in India*” was awarded to CSIR-NEERI by the Secretariat of Stockholm Convention, Geneva under the small scale funding agreement (SSFA) which included following objectives;

1. To conduct a desk study on inventory of new POPs especially PBDEs and PFOS.
2. To develop and validate methodologies for sampling, screening and analysis of these POPs in articles.
3. To enhance understanding on the Persistent Organic Pollutants (POPs) newly listed in the Stockholm Convention and to clarify the obligations and possible implications at the national level for the India.
4. To raise awareness and enhance the capacity of workshop participants about the sound management of the newly listed POPs that are widely used for industrial purposes – i.e. hexabromobiphenyl, pentabromodiphenyl ether, octabromodiphenyl ether (PBDEs) and perflurooctane sulphonic acid (PFOS), its salts and perflurooctane sulfonyl fluoride (PFOSF).
5. To raise awareness among countries in the region about the guidance documents for NIP updating and gather their feedback.

## 8.0 Structure of the Workshop

To achieve the objectives of the workshop, CSIR-NEERI organized a four day workshop on “*Pilot testing of guidance for the review and updating of National Implementation Plan in India*” during June 18-21, 2012. This workshop served as a platform to gather and share the information with respect to industrial POPs, their status in India, management strategy followed in India and abroad. The workshop

covered various lectures by experts followed by group exercises by participants to share their views and knowledge gained by them on various aspects of POPs during the workshop. The lab visits were also organized to demonstrate various facilities available at CSIR-NEERI for analysis of PBDEs and other POPs and the steps followed by CSIR-NEERI team to analyse samples suspected of containing PBDEs. The agenda of the workshop is enclosed as **Annexure-I**.

National and International participants (Indonesia, Sri Lanka and Thailand) from various agencies attended the workshop. The workshop was inaugurated at CSIR-NEERI on June 18, 2012 by Ms. Jacqueline Alvarez, Programme officer, Secretariat of the Basel, Rotterdam, Stockholm Conventions, Geneva in the presence of Dr S. R. Wate, Director, CSIR-NEERI; Dr. Asha A. Juwarkar, Chief Scientist and Head, Eco-System Division, CSIR-NEERI; Dr. Chhanda Chowdury, Director, HSDM, MoEF; Prof. Ivan Holoubek, RECETOX, Czech Republic; Mr. Roland Weber, Consultant, POPs Environmental Consulting, Germany. Dr. Reiner Arndt, Chairman of the POPs Review Committee, Germany also attended the workshop and delivered valuable lectures. The inaugural function was followed with the opening remarks by Dr S. R. Wate, where he extended the warm welcome to all the expert members and participants of workshop and also wished the workshop to be successful. He gave an overview of the workshop and activities to be taken up by the centre for mitigation of POPs. The workshop organizer, Dr. Asha A. Juwarkar, made a presentation on workshop objectives and also introduced the participants. The list of participants is enclosed as **Annexure-II**.

## 9.0 Proceedings of the Workshop

### DAY 1 (June 18, 2012)



Prof. Ivan Holoubek, RECETOX, Czech Republic, lighting the candle during the inauguration of workshop

*(Standing behind: L to R; Dr. Asha A. Juwarkar, Chief Scientist and Head, Eco-System Division, CSIR-NEERI; Dr. S. R. Wate, Director, CSIR-NEERI; J. Alvarez, Secretariat of the Basel, Rotterdam, Stockholm Conventions)*

## Welcome address and opening Remarks

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The workshop started with the welcome address by **Dr. S. R. Wate** which was followed by the opening remarks of **Ms. Jacqueline Alvarez**. Dr. Wate emphasized on the past and present activities on monitoring, R&D and awareness programmes with respect to POPs undertaken by CSIR-NEERI. Ms. Jacqueline highlighted the agenda of the workshop and the outcomes which are expected from the workshop.



**Dr. S.R. Wate, Director, CSIR-NEERI delivering the welcome address**

## (Technical Sessions)

### Lecture 1. Objectives of the workshop and introduction of participants

**Speaker:** Dr. Asha A. Juwarkar, CSIR-NEERI, Nagpur



The technical session started with the lecture by **Dr. Asha A. Juwarkar** who gave an overview on the objectives and expected outcomes of the four day workshop. She also gave brief introduction about POPs and new POPs especially PBDEs and PFOS.

### Lecture 2. Introduction to the new POPs listed under the Stockholm Convention and related obligations

**Speaker:** Ms. Jacqueline Alvarez, Secretariat of the Basel, Rotterdam, Stockholm Conventions

**Ms. Jacqueline Alvarez**, in her presentation on new POPs discussed in detailed about their identity, past/present uses, alternatives, and obligations under the Convention. Ms. Jacqueline also discussed key recommendations of POPRC on risk reduction for PBDEs and PFOS. She also highlighted the environmentally sound management of



obsolete stockpiles of these POPs

### **Lecture 3. NIP updating: a framework for developing strategies to address the POPs listed in 2009 and 2011**

**Speaker:** *Ms. Jacqueline Alvarez, Secretariat of the Basel, Rotterdam, Stockholm Conventions*

The lecture on new POPs was followed by the lecture on NIP Updating in which **Ms.**



**Jacqueline** highlighted process for reviewing and updating national implementation plans with respect to newly added POPs. She discussed in her presentation about framework for updation of NIPs. She also drew attention on specific action plans for new POPs.

### **Lecture 4. National Implementation Plan (NIP) on Stockholm Convention on Persistent Organic Pollutants (POPs)**

**Speaker:** *Mr. Gamini Gamage, Ministry of Environment, Sri Lanka*

**Mr. Gamini Gamage**, who represented Sri Lanka in the workshop provided emphasis on activities conducted to implement the convention at country level in Sri Lanka. He discussed major action plans adopted in the development of NIP along with the constraints/gaps experienced. He also highlighted the proposed future activities with respect to POPs and new POPs in Sri Lanka.



## Lecture 5. Progress Review of the initial National Implementation Plan: Thailand

**Speaker** : *Mr. Manorat Rittem, Ministry of Natural Resources and Environment, Thailand*



**Mr. Manorat Rittem**, country representative from Thailand briefed about the process of formulation of first NIP in Thailand. Further in his presentation, he discussed about the present status of the new POPs and progress of the updating the NIP in Thailand. He also discussed about the proposed action plans on new POPs in Thailand.

## Lecture 6. Understanding PFOS

**Speaker:** *Prof. Ivan Holoubek, RECETOX, Czech Republic*

**Prof. Ivan Holoubek**, an expert on POPs from RECETOX, Czech Republic delivered a very important and detailed presentation on PFOS, with respect to its production, past use, present use, life cycle and potential alternatives of these chemicals. He also emphasized on the products, articles and wastes containing PFOS. Further, he elaborated the steps involved in the preparation of inventory along with the key recommendations with respect to risk reduction.



## **Working group exercise 1**

**on**

### **Planning an initial assessment of PFOS and methodology for data collection**

The working group exercise was conducted for the participants to gather knowledge about country-specific information on PFOS and pesticides that can support the implementation of pilot testing activities in India. The information gathered will assist the inventory task teams for further investigation on these chemicals.



***The lectures of the speakers were followed by interactive session in which the queries of the participants were answered by the experts.***

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## Day 2 (June 19, 2012)

### Lecture 7. Understanding POP-PBDEs

**Speaker :** *Dr. Roland Weber, POPs Environmental Consultancy, Germany*

The second day of the workshop started with the very detailed and informative lecture by **Dr. Roland Weber**. He explained the production, use material flow in articles & products and convention obligations with respect to PBDEs/BFRs. Further, identification and inventory of new POPs in the life cycle stages was discussed in detail.



He also briefed the possible environmental and health impacts of these chemicals.

### Lecture 8. Specific exemptions and acceptable purposes for the POPs listed in 2009 and 2011 and their implications

**Speaker:** *Dr. Riener Arndt, Chairman, POP Review Committee*



**Dr. Rirner Arndt**, in his first lecture of the workshop beautifully presented the specific exemptions and acceptable purposes for newly listed POPs and their implications along with the legal obligations for their production, use and trade. He explained the regulatory status of POPs and new POPs and explained the difference between the chemicals listed in Annex A and Annex B of

the Stockholm Convention.

## Lecture 9. Overview of the methodology for the inventory of POPs

**Speaker :** Ms. Jacqueline Alvarez, Secretariat of the Basel, Rotterdam, Stockholm Conventions

**Ms. Jacqueline Alvarez** in her lecture presented the methodology for the inventorization of new POPs. Her lecture covered various steps involved in preparation of inventory which included planning of inventory, data collection methodology, collection and compilation of data, managing and evaluating the data and finally preparation of inventory report.



## Lecture 10. Approaches for the inventory of industrial POPs

**Speaker :** Dr. Roland Weber, POPs Environmental Consultancy, Germany



**Dr. Roland Weber** in his second lecture of the workshop presented the approaches for establishing the inventories for POP-BDEs and PFOS very comprehensively. He explained in guidance for the inventory of commercial c-PentaBDE, c-OctaBDE HBB and PFOS. He also emphasized on potential contaminated sites with PBDEs and PFOs.

## Lecture 11. Regulatory framework for the management of POPs in India: Effectiveness and gaps

**Speaker:** *Dr. Chhanda Chowdhury, MoEF, New Delhi*

**Dr. Chhanda Chowdhury**, in her presentation described the regulatory framework for management of POPs in India. She described the ministerial roles and responsibilities for the management of POPs chemicals. She gave special emphasis on management of PCBs with respect to its uses, sector wise distribution and post NIP project on disposal of PCBs in India.



## Lecture 12. Chemical Industries and Stockholm Convention

**Speaker :** *Mr. S. Ganesan, Indian Chemical Council & International Treaties Expert committee*



**Mr. S. Ganesan**, industry representative in the workshop in his short lecture emphasized on the trade of chemicals in international and Indian market. He also explained beautifully some bare facts of Stockholm Convention.

## Working group exercise 2

on

### Evaluation of Existing Capacities and Capacity Building Needs to Analyze POPs; Questionnaire for POPs Laboratories

Second Working group exercise was conducted for evaluating the existing capacities and capacity building needs to analyze POPs. Based on pre-preared questionnaire, information were gathered regarding different labortories who have the capacity to anlyze these chemicals in their lab. The participants suggested the names of laboratories who have the facility of analyzing these POPs viz, CSIR-NEERI, CPCB, CSIR-NIIST, CPRI, NABL accredited laboratories etc. Informations were also gathered on type of analysis offered by the laboratories, methods used for the identification and quantification of POPs and specific matrices, number of samples analyzed per matrix, Quality assurance Program, accreditation, equipments available in CSIR-NEERI, etc. The information gathered would be helpful to carry out some collaborative work in the area of POPs analysis in India.



***The lectures of the speakers were followed by interactive session in which the queries of the participants were answered by the experts.***

## Day 3 (June 20, 2012)

### Lecture 13. Management options for the production and use of PFOS

**Speaker :** Prof. Ivan Holoubek, RECETOX, Czech Republic

**Prof. Ivan Holoubek** started his lecture with the key points for management of chemicals in the environment. Further, he briefed about the guidance for BAT and BEP for the POPs chemicals. He also explained the uses of PFOS identified by POPRC and potential alternatives of these chemicals. He explained the material flow analysis scheme and the life cycle of PFOS, recommendations for the risk reduction, BAT/BEP with respect to the PFOS and related chemicals.



### Lecture 14. Management options for the waste disposal and recycling of articles containing POP-PBDEs

**Speaker :** Dr. Roland Weber, POPs Environmental Consultancy, Germany



**Dr. Roland Weber** also explained the guidelines on BAT and BEP for recycling and disposal of articles containing PBDE under the Stockholm Convention. He also explained the material flow in PBDE containing articles and the potential alternatives of these chemicals. Further, he briefed about the energy/material recovery and disposal techniques of PBDE containing articles.

## Lecture 15. Approaches to facilitate the monitoring of POPs listed in 2009 and 2011 throughout their life-cycle, including labelling

**Speaker :** *Dr. Riener Arndt, Chairman, POP Review Committee*

**Dr. Riener Arndt**, in his lecture explained the general provisions and regulatory status for the chemicals in Annex A and Annex B with special emphasis on PBDEs and PFOS. He also explained the regulations for trade of these new POPs between the parties and monitoring strategies for products and articles containing new POPs. He also emphasized on potential for international harmonization of labeling systems for POPs.



## Lecture 16. Roadmap and key considerations for screening and analysis of POPs-PBDEs and PFOS

**Speaker:** *Prof. Ivan Holoubek, RECETOX, Czech Republic*



**Prof. Ivan Holoubek**, in his last lecture of the workshop explained the steps involved in the screening and analysis of environmental samples, specific problems in environment analysis and methodologies involved in POPs analysis. He briefed about the guidance for sampling, sample preparation and final analysis of the samples. He also gave few examples of analysis of these new POPs in products and articles.

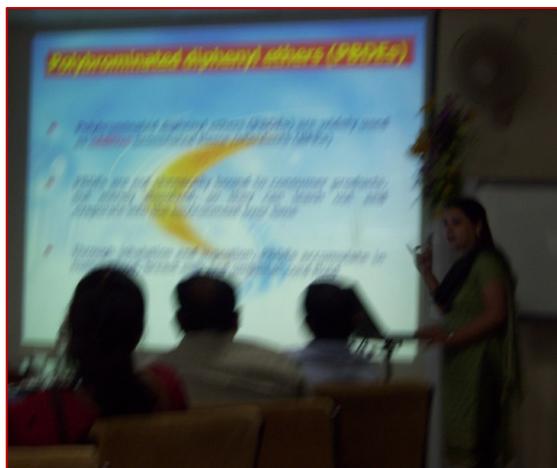
## Lecture 17. Overview of the pilot project on the screening and analysis of POP-PBDEs and PFOS in India

**Speaker :** Dr. Kavita Gandhi and Dr. Kanchan Kunari, CSIR-NEERI, Nagpur



**Dr. Kavita Gandhi** started her lecture with the objective of the pilot project in India and explained the major activities carried out under the project. She explained certain screening techniques for new POPs and also cited few examples of analysis of PBDEs in India and Asia region.

The presentation was further continued by **Dr. Kanchan Kumari**, who briefed about the results of the pilot project on screening and analysis of PBDEs in India. She presented the methodology adopted for the analysis of the PBDEs in various samples and also presented the analytical results of PBDEs analysis undertaken by NEERI.



### Pilot study for analysis of PBDEs in India

The main highlight of the workshop was the pilot study for the analysis of PBDEs in articles which was carried out by CSIR-NEERI team to assess the capacity of the country in analyzing the industrial POPs i.e. PBDEs. The study was technically supported by Research Centre for Toxic Compounds in the Environment (RECETOX), Czech Republic. For the first time in India, CSIR-NEERI attempted to

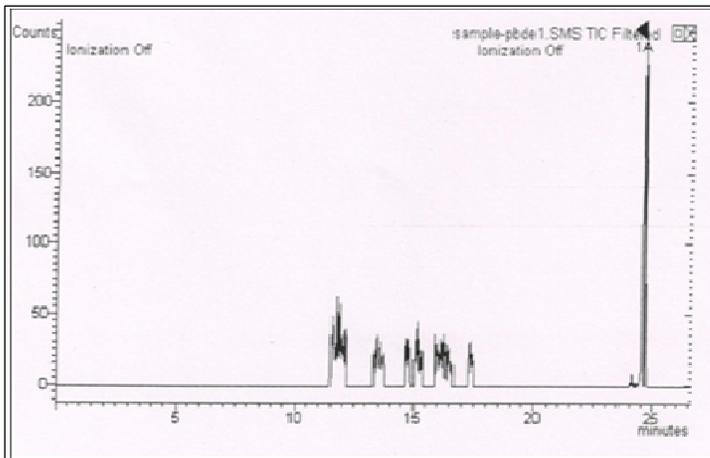
analyze PBDEs in various samples which were suspected to contain brominated flame retardants. The standards for analysis of PBDEs were provided by RECETOX. Various samples viz. foam from upholstery, motherboard of a computer (manufactured in Taiwan in 1996), children toy composite sample, vanishing blind sample, electrical wire sample, PVC flooring sample were collected. The sample volume taken for analysis was 5 gm for each sample. These samples were analyzed for the presence of different PBDE congeners viz. BDE-28, BDE-47, BDE-99, BDE-100, BDE-153, BDE-154, BDE-183 and BDE-209. It was found that three out of six samples were positive for the presence of PBDEs. Three congeners were detected in the samples i.e. BDE-47, BDE-153 and BDE-209. Of which, highest concentration was found was of BDE-209. Among the samples, motherboard of computer showed the presence of BDE-209 with a concentration as high as 11584 mgkg<sup>-1</sup> while vanishing blind showed 4799 mgkg<sup>-1</sup> of BDE-209. The results of the analysis of PBDEs are presented in **Table 1**.

The results of the pilot project on the analysis of PBDEs in different samples showed that CSIR-NEERI, India has the capacity and facilities for the analysis of these chemicals and the experience gained will be very helpful in updating of the national implementation plan with respect to new POPs.

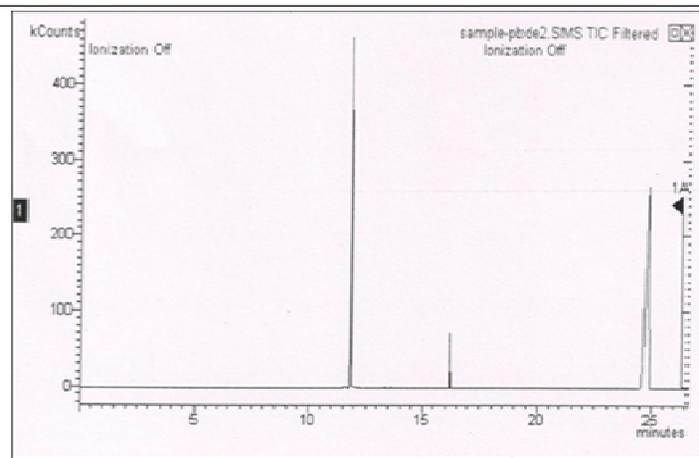
**Table 1: Concentration of PBDEs in different samples**

Sample	Conc. of PBDE mgkg <sup>-1</sup>		
	BDE-47	BDE-153	BDE-209
Foam from upholstery	ND	ND	7.023
Motherboard of a computer	1.173	0.259	11583.8
Toys	--	--	--
Vanishing blind	ND	ND	4798.72
Electrical wire	ND	ND	ND
PVC flooring	ND	ND	ND

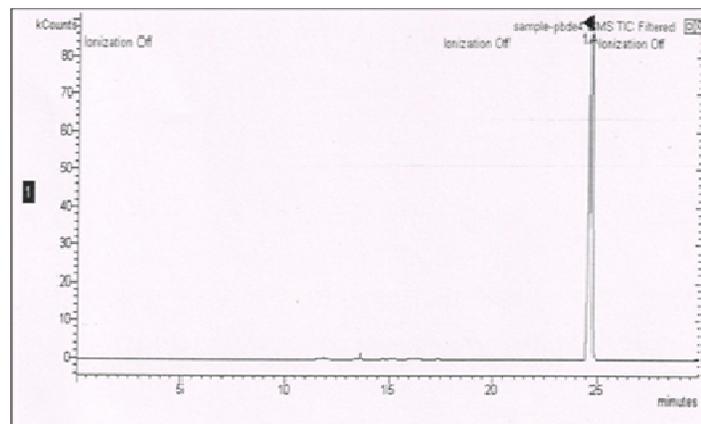
\*ND- Not Detected



**Polyurethane Foam**



**Computer Motherboard**



**Vanishing blind**

**GCMS Chromatograms of the various samples for the presence of PBDE congeners**

**Lecture 18. Overview of capacity building activities related to POPs listed in 2009 and 2011 and NIP updating**

*Speaker: Ms. Cynthia Indriani, BCRC, Indonesia*

**Ms. Cynthia Indriani**, representative of the Basel Convention Regional Centre (BCRC), Indonesia in her presentation introduced the BCRC-South East Asia region and its activities related to POPs. She briefed about the past and present projects of the centre, awareness workshops/training programmes held at the centre and future workplans of the centre.



***The lectures of the speakers were followed by interactive session in which the queries of the participants were answered by the experts. The third day was the closure of the sub-regional component of the workshop.***

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## Day 4 (June 21, 2012)

### Lecture 19. Developing a roadmap for the assessment of industrial POPs in India

**Speaker:** Mr. S.K. Singh, Dr. Asha A. Juwarkar and Mrs. Rashmi Misra, CSIR-NEERI, Nagpur



The first lecture of the final day of the workshop started with a very important lecture by **Mr. S.K. Singh**, in which he delivered his lecture on developing a roadmap for the assessment of industrial POPs in India in which he beautifully explained the process and outline of the roadmap which included planning and preparation, visioning, roadmap development and roadmap implementation and revision.

### Lecture 20. Inventory of PCB and DDT in India: lessons learnt and recommendations

**Speaker:** Dr. Asha A. Juwarkar and Mr. Jitendra K. Sharma, CSIR-NEERI, Nagpur

**Mr. Jitendra Sharma** started his lecture with the specific objectives of National Implementation Plan preparation in India and elaborated the inventory of PCBs and DDT in India during the NIP preparation. He also briefed regarding the PCBs and DDT contaminated sites in the country. He ended his presentation with the very important points on lessons learnt during the preparation of NIP and recommendations of the NIP.



## Lecture 21. Inventory on Unintentionally produced POPs - Dioxins and Furans, Indian Scenario

**Speaker :** Dr. N. P. Thacker, CSIR-NEERI, Nagpur



**Dr. N.P. Thacker**, elaborated the inventory on unintentionally produced POPs i.e. Dioxins and Furans. She explained the inventory methodology, annual emissions of dioxins and furans with different categories of sources and region wise distribution of release of dioxin and furans in India.

### Working group exercise 3 on Assessment of industrial POPs in India

The last exercise was coordinated by **Ms. Jacqueline Alvarez** on assessment of industrial POPs in India to gather knowledge from participants about country-specific



information on industrial POPs that can inform and support the implementation of activities in India. The aim of the exercise was to explore options for management of industrial POPs throughout their life-cycle and identify those that require further attention when updating the NIP. In this exercise different issues viz., production, import, export, use, stockpiles, waste

disposal, monitoring, etc were discussed for PBDEs, PFOs and PCBs.

### **Visit to analytical facilities at CSIR-NEERI, Nagpur**

The visit of the participants and experts to the analytical facilities of CSIR-NEERI was coordinated by **Mr. G.S. Kanade** in which the participants and experts were shown various facilities of CSIR-NEERI including the facilities for the analysis

of POPs and new POPs which was well appreciated by the experts and participants. The methodology and instruments used for the analysis of PBDEs was also explained to the participants. The experts also visited the newly constructed dedicated office of the SCRC at CSIR-NEERI and appreciated the efforts made by the coordinator Dr. Asha A. Juwarkar.



***Visit of the participants and experts to the analytical facility of CSIR-NEERI, Nagpur***

## **Lecture 22. A roadmap for undertaking the assessment of industrial POPs in India**

***Speaker: Dr. S. R. Wate, CSIR-NEERI, Nagpur***

The last lecture of the workshop was presented by **Dr. S. R. Wate**, in which he elaborated the steps involved in developing a roadmap for the assessment of industrial POPs in India. Also, he presented the recommendations and key notes on the assessment of industrial POPs in India with respect to collection of data, field survey, awareness programmes, collection and analysis of samples, reports on findings and finally updating the NIP of India.



## 10.0 Discussions, Future Planning, Outcomes and Recommendations

The following points were discussed:

**Dr. S. R. Wate** was of the opinion that the database of toxicity of POPs in human and fishes should be developed and the condition effect relationship should also be established.

**Dr. Roland Weber** suggested the participants to read the guidance material provided by Stockholm office. He also informed that China has already developed a road map.

**Ms. Jacqueline Alvarez** was happy with the outcome of the workshop and expressed that the main objective of the workshop to raise awareness on new POPs has been fulfilled.

**Prof. Ivan Holoubek** informed that Czech Republic is the first country whose has conducted full inventorization of POPs. India being a large country requires a good number of samples to be analysed, he expressed.

**Dr. Ashwani Sharma** from MoEF, New Delhi informed the participants about the new legislation on E-wastes. He also informed that the Ministry is also planning to develop a regulatory framework for New POPs.

**Mr. Rajeev Betne**, representative of Toxics link, was of the opinion that involvement of large number of stakeholders is required to address the issues related to New POPs.

**Dr. C. S. Sharma** from CPCB, Delhi appreciated the road map prepared by NEERI for India and discussed the different gaps which further need to be addressed. He also expressed that labelling of articles containing such chemicals should be considered.

**Mr. Praveen Sharma** from Himachal Pradesh State Pollution Control Board, Shimla informed about the status of management of E-waste in Shimla; there are two authorized transporters for e-waste transport. He also informed the participants that they are also working for the inventory of E-waste.

**Mr. R V. Singh**, Deputy Director, Ministry of Agriculture, Faridabad appreciated the efforts of NEERI for providing a common platform for discussion on this New POPs Issues. He emphasised that the road map of different countries with similar problems should be provide to India for harmonisation to save time.

**Mr. Manish Kashyap**, Chhattisgarh Environment Conservation Board, Raipur was of concern that proper care should be taken in selection of alternatives of these POPs. He further expressed that some case studies of those countries who have replaced POPs/New POPs with new alternatives should also be presented.

**Dr. Riener Arndt**, POPs Review Committee replied that the decision of sharing of roadmaps depends on the country. If India is ready to share the road map then other countries may come forward to share it.

**Mr. P K. Barai and Mr. S. Roy** from West Bengal Pollution Control Board thanked NEERI and secretariat of Stockholm Convention for organising such a valuable and informative workshop on this topic. Shri Barai was of opinion that the old POPs has to be eradicated first then only we will be in a position to eradicate new POPs. Prioritization of work in this regard is needed.

**Dr. S N. Tiwari** from MP Pollution Control Board, Bhopal expressed that CPCB, Delhi is the regulatory body for giving direction in this regard and they are ready to monitor these chemicals in future depending on the direction of CPCB, Delhi. He was satisfied with outcomes of the workshop.

**Mr. P C. Gupta** from ASI, Agra thanked Dr. (Mrs.) Asha A. Juwarkar for organising such an informative workshop in NEERI. He informed that he is involved in air pollution monitoring and this workshop provided him a good insight of New POPs.

**Mr. V K. Rajeevan** from Kerala State Pollution Control Board told that analysis part is more important to have some data base of new POPs in India.

**Mr. S P. Badholiya** from MP Pollution Control Board, Bhopal expressed that a forum should be created to share information on these issues.

**Mrs. Anjana Pant**, Director of Living Ganga Program, Delhi was of the opinion that interdisciplinary work is required and promised NEERI to extend her support in future if required.

**Dr. Irani Mukherjee** from IARI, Delhi congratulated NEERI for organising such an informative and successful workshop on New POPs. She also expressed her satisfaction on the analysis work carried out by NEERI on PBDEs and congratulated the team involved in analysis of PBDEs.

**Mr. K M. Nagraj** from Karnataka State Pollution Control Board emphasised that the first target to address the new POPs should be the inventory. He also discussed about Indian scenario, transport sector, consumption pattern and different climatic condition of India. He was of opinion that Secretariat of Stockholm should come up with some case studies right from banning of these chemicals to switching over the alternatives. He was also concern about the human resource required for such type of analysis and asked Stockholm to provide SOPs to them.

## **11.0 Concluding Ceremony**

The workshop was concluded on June 21, 2012 in the gracious presence of **Dr. S.R. Wate, Director, CSIR-NEERI**. In his concluding address, he thanked **Secretariat of Stockholm Convention, Geneva, Switzerland** and **Ministry of Environment and Forests (MoEF), Govt. of India, New Delhi** for entrusting CSIR-NEERI, Stockholm Convention Regional Centre on POPs for Asia region for organizing such an important workshop. He appreciated the efforts of team involved in organizing very useful and informative workshop. He also expressed that some

procedure should be developed to remove or substitute bromine to render PBDEs a harmless product. The certificates were distributed to the participants by **Dr. S.R. Wate** and **Ms. Jacqueline Alvarez**.

**Dr. Riener Arndt**, thanked CSIR-NEERI for their hospitality and asked India to ratify these chemicals as soon as possible. **Ms. Jacqueline Alvarez** thanked **Dr. S. R. Wate** for sparing his valuable time during the workshop. She also thanked **Dr. Asha A. Juwarkar** for organizing the workshop in a professional way.

**Dr. Asha A. Juwarkar** also thanked Secretariat of Stockholm Convention and MoEF for their extensive support during the workshop. She also extended her gratitude to the workshop participants for their sincere efforts, attention and fruitful interactive sessions that contributed greatly towards the success of the workshop. She highly acknowledged the support to Dr. Wate organizing this training programme.

Overall, the workshop was a grand success and strengthened the centre to carry out further research work in the field of new POPs.

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# **Annexure - I**

## Agenda of Workshop

DAY 1: Background on the POPs listed in 2009 and 2011 and introduction to the guidelines for NIP updating		
<b>09:00-09:30</b>	Registration of participants	
<b>09:30-09:45</b>	Opening remarks	Dr. S. R. Wate Director, CSIR-NEERI J. Alvarez Secretariat of the Basel, Rotterdam, Stockholm Conventions
<b>09:45-10:00</b>	Objectives of the workshop and introduction of participants	Dr. A. A. Juwarkar CSIR-NEERI
<b>10:00-10:45</b>	Introduction to the POPs listed in 2009 and 2011 under the Stockholm Convention and related obligations <i>Questions and answers</i>	J. Alvarez Secretariat of the Basel, Rotterdam, Stockholm Conventions
<b>10:45-11:00</b>	<i>Coffee break</i>	
<b>11:00-11:45</b>	NIP updating: a framework for developing strategies to address the POPs listed in 2009 and 2011 <i>Questions and answers</i>	J. Alvarez Secretariat of the Basel, Rotterdam, Stockholm Conventions
<b>11:45-13:00</b>	Country presentations: 10 minute presentation from each country representative about progress review of the initial NIP <i>Questions and answers</i>	Country representatives
<b>13:00-14:00</b>	<i>Lunch break</i>	
<b>14:00-14:45</b>	Understanding PFOS <i>Questions and answers</i>	Ivan Holoubek RECETOX
<b>14:45-16:15</b>	Working group: Planning an initial assessment of PFOS and methodology for data collection	All participants
<b>16:15-16:30</b>	<i>Coffee break</i>	
<b>16:30-17:30</b>	Debrief and discussion	All participants
<b>17:30-18:00</b>	Wrap-up and overview of agenda for day 2	Dr. A. A. Juwarkar CSIR-NEERI

<b>DAY 2: Understanding industrial POPs and their inventory</b>		
<b>09:30-10:00</b>	Understanding POP-PBDEs <i>Questions and answers</i>	Roland Weber, POPs Environmental Consulting, Germany
<b>10:00-10:45</b>	Specific exemptions and acceptable purposes for the POPs listed in 2009 and 2011 and their implications	Reiner Arndt, Chair of the POPs Review Committee
<b>10:45-11:00</b>	<i>Coffee break</i>	
<b>11:00-11:45</b>	Overview of the methodology for the inventory of POPs	J. Alvarez Secretariat of the Basel, Rotterdam, Stockholm Conventions
<b>11:45-12:30</b>	Approaches for the inventory of industrial POPs	Roland Weber POPs Environmental Consulting, Germany
<b>12:30-13:30</b>	<i>Lunch break</i>	
<b>13:30-14:30</b>	Working group exercise: Planning an initial assessment of POP-PBDEs and	All participants
<b>14:30-15:15</b>	Debrief and discussion	
<b>15:15-15:30</b>	<i>Coffee break</i>	
<b>15:30-17:00</b>	Working group exercise 3: Methodologies for data collection of POP-PBDEs	All participants
<b>17:00-17:30</b>	Debrief and discussions	
<b>17:30-18:00</b>	Wrap-up and overview of agenda for day 3	Ivan Holoubek, RECETOX

**DAY 3: Exploring strategies for the management of POPs listed in 2009 and 2011**

<b>9:30-10:10</b>	Management options for the production and use of PFOS <i>Questions and answers</i>	Ivan Holoubek RECETOX
<b>10:10-10:45</b>	Management options for the waste disposal and recycling of articles containing POP-PBDEs <i>Questions and answers</i>	Roland Weber POPs Environmental Consulting, Germany
<b>10:45-11:00</b>	<i>Coffee break</i>	
<b>11:00-11:45</b>	Approaches to facilitate the monitoring of POPs listed in 2009 and 2011 throughout their life-cycle, including labelling <i>Questions and answers</i>	Reiner Arndt Chair of the POPs Review Committee
<b>11:45-12:30</b>	Roadmap and key considerations for screening and analysis of POPs-PBDEs and PFOS <i>Questions and answers</i>	Ivan Holoubek RECETOX
<b>12:30-13:00</b>	Overview of the pilot project on the screening and analysis of POP-PBDEs and PFOS in India <i>Questions and answers</i>	Dr. Kavita Gandhi, Dr. Kanchan Kumari CSIR-NEERI
<b>13:00-14:00</b>	<i>Lunch</i>	
<b>14:00-14:30</b>	Overview of capacity building activities related to POPs listed in 2009 and 2011 and NIP updating	Regional Centre China
<b>14:30-15:00</b>	Overview of capacity building activities related to POPs listed in 2009 and 2011 and NIP updating	Regional Centre Indonesia
<b>15:00-15:15</b>	<i>Coffee break</i>	
<b>15:15-16:45</b>	Working group exercise 4	All participants
<b>16:45-17:30</b>	Debrief and discussions	Dr. Kanchan Kumari CSIR-NEERI
<b>17:30-18:00</b>	Wrap up and closure of subregional component of the workshop	J. Alvarez

#### DAY 4: Assessment of industrial POPs in India

<b>09:30-10:00</b>	Developing a roadmap for the assessment of industrial POPs in India <i>Questions and answers</i>	Dr. Asha A. Juwarkar, Mr. S K Singh, Mrs. Rashmi R. Misra CSIR-NEERI
<b>10:00-10:45</b>	Regulatory framework for the management of POPs in India: effectiveness and gaps <i>Questions and answers</i>	Dr. Chhanda Chowdury MoEF
<b>10:45-11:00</b>	<i>Coffee break</i>	
<b>11:00-11:30</b>	Inventory of PCB and DDT in India: lessons learnt and recommendations <i>Questions and answers</i>	Dr. A. A. Juwarkar, Mr. Jitendra Sharma CSIR-NEERI
<b>11:30-12:30</b>	Activities related to e-waste and their management, including EEE recycling, in India <i>Questions and answers</i>	Dr. A. N. Vaidya / Dr. M. P. Patil CSIR-NEERI
<b>12:30-13:00</b>	Inventory on Unintentionally produced POPs - Dioxins and Furans Indian Scenario <i>Questions and answers</i>	Dr. N. P. Thacker CSIR-NEERI
<b>13:00-14:00</b>	<i>Lunch break</i>	
<b>14:00-15:00</b>	Visit of analytical facilities at CSIR-NEERI	Mr. G. S. Kanade CSIR-NEERI
<b>15:00-15:15</b>	<i>Coffee break</i>	
<b>15:15-16:45</b>	Working group exercise	All participants
<b>16:45-17:15</b>	Debrief and discussions	
<b>17:15-17:45</b>	Presentation of the a roadmap for undertaking the assessment of industrial POPs in India	Dr. S. R. Wate CSIR-NEERI
<b>17:45-18:00</b>	Wrap up and closure of the workshop	Dr. S. R. Wate CSIR-NEERI

# **Annexure - II**

## List of Participants

Sr. No.	Name	Designation and organization
1	Mr. R V. Singh	Deputy Director Ministry of Agriculture, Faridabad
2	Mr. P K. Barai	Sr. Scientist, West Bengal Pollution Control Board, Kolkata
3	Mr. S. Roy	Scientist, West Bengal Pollution Control Board, Kolkata
4	Mr. V K. Rajeevan	Env. Scientist, Kerala State Pollution Control Board, Ernakulam
5	Mr. K M. Nagraj	RSEO, Karnataka State Pollution Control Board, Bangalore
6	Mr. Praveen Sharma	JSO, Himachal Pradesh State Pollution Control Board, Shimla
7	Mrs. Anjana Pant	Director, Living Ganga Program, Delhi
8	Dr. Chhanda Chowdhary	Director, HSMD, Ministry of Environment and Forest, New Delhi
9	Dr. Ashwini Sharma	Asst. Project Coordinator, HSMD, Ministry of Environment and Forest, New Delhi
10	Dr. Irani Mukherjee	Principal Scientist, Indian Agriculture Research Institute, New Delhi
11	Dr. C.S. Sharma	Scientist D, Central Pollution Control Board, New Delhi
12	Mr. S. Ganesan	Chairman, Indian Chemical Council, Secunderabad
14	Ms. Cynthia Indriani	Executive Secretary, Basel Convention Regional Centre-South East Asia, Indonesia

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<b>Sr. No.</b>	<b>Name</b>	<b>Designation and organization</b>
15	Mr. Manorat Rittem	Environmentalist, Ministry of Natural Resources and Environment, Thailand
16	Mr. Gamini Gamage	Additional Secretary, Ministry of Environment, Sri Lanka
17	Dr. S N. Tiwari	Scientist, Madhya Pradesh Pollution Control Board, Bhopal
18	Shri S P. Badholiya	Scientist Madhya Pradesh Pollution Control Board, Shahdol
19	Mr. Manish Kashyap	Executive Engineer, Chhattisgarh Pollution Control Board, Bhopal
20	Mr. R B. Andhale	Sub. Regional officer, Maharashtra Pollution Control Board, Bhopal
21	Shri P C. Gupta	Deputy SAC, Archeological Survey of India, Agra
22	Dr. Dipanjali Majumdar	Scientist, Kolkata Zonal Laboratory, CSIR-NEERI, Kolkata
23	Dr. Kanchan Kumari	Scientist, CSIR-NEERI, Nagpur
24	Dr. Kavita Gandhi	Scientist, CSIR-NEERI, Nagpur
25	Mrs. Rashmi Misra	Technical Assistant, CSIR-NEERI, Nagpur