



Prepared on behalf of International HCH and Pesticides Association (IHPA)

Aim

The aim of this newsletter is to disseminate information in a cost-effective way on the developments taking place in bioremediation technology moving the frontiers of technology for commercial exploitation both in developed and developing countries. Special emphasis will be given to bio-removal of pollutants in soil, water matrices and will cover mainly Persistent Organic Pollutants (POPs) as designated by the Stockholm Convention on POPs and also other persistent toxic pollutants not covered under the POPs conventions. It will also highlight cleaner and environment friendly technologies, which show good promise in this area. The newsletter will not go into technical details of selected scientific publications but only highlight salient features for the benefit of the readers.

Note from the Editor

The Montreal Protocol on ozone depleting substances (ODS) and the recent Stockholm Convention on POPs are watershed in the history of chemical pollution in that they set standards of responsibility and ways and means for producers/users and governments in mitigating the side effects of those chemicals which stayed on, entering the food chain and causing damage to the environment long after their proper use (and misuse). These conventions (along with Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal) give a powerful weapon in the arsenal of stakeholders to protect humanity and the environment from these once extremely useful chemicals of the last millennium. POP such as DDT will still find a place in some countries to fight control of vector borne diseases.

The role of NGOs in these conventions was specifically highlighted because of their special status in interacting with community at the grass root level and also at various levels with Governments, industrialists and the donor communities. In this connection, the meetings such as the HCH and Pesticides Forum organized by the International HCH and Pesticides Association (IHPA) become an important factor in facilitating and creating awareness and flagging out hot spots with respect to POPs.

It is almost one year since the Poznan Forum organized by Plant Protection Institute of Poland and the International HCH and Pesticides Association (IHPA). It was recommended in the Forum to come up with a small working group to promote bioremediation as a means of promoting green technology for cleaning of contaminated sites, which could specially benefit developing countries. As a first step, this Newsletter is distributed now to a network of interested parties and will be available on the 6th Forum Website: www.6thhchforum.com and in the near future also on the Home page of the Association of Former UN Industry and Development Experts (AFIDE). Subscription can be made as follows visit: www.ihoa.info/newsletter.php

It is proposed to bring out three issues of the Newsletter every year. The editor will be very pleased to receive any information or small articles related to bioremediation of POPs and related areas for publication. We also want to include calendar of events on this topic taking place around the world, which would be of use to the readers. In addition, the Newsletter would like to bring out to the attention of the readers and those involved in POPs about environment friendly technologies that have been commercialized or have potential for commercialization.

This Newsletter will be a vehicle for bringing awareness to stakeholders the importance of green technology in decontamination of especially contaminated soils and water sources. Success of the newsletter very much depends on voluntary contributions from readers in terms of articles, news items and calendar of events related to bioremediation of POPs and other toxic and persistent pollutants.

Poznan Meeting

The 6th International HCH and Pesticides Forum, Poznan held in March 2001, was an eye opener on the problems faced by Central and Eastern Europe and Central Asia on obsolete pesticides. Participants came from Government ministries, research departments, international and national organizations, from industries, NGOs and donor institutions. The Forum through its recommendations brought together a strong and very broad consensus on the actions needed to overcome the POP menace. Various options covering combustion and non combustion technologies were covered in the Forum. Next to the conventional methods, new methods have been shown on biochemical degradation, gas-phase chemical reduction etc.. While many papers covered stored obsolete pesticides, the soil and water sessions discussed the level of pollution, movement of pollutants, risk assessment tools, prioritization , and technical solutions such as controlled disposal, in situ microbiological degradation using combination of anaerobic and aerobic treatment and also phytoremediation which needs further research work. In Germany, Netherlands Canada, Hungary etc. pilot experiments on bioremediation/phytoremediation are being scaled up for commercial exploitation. The Forum also emphasized the EF/UN mechanism, established by the POPs convention, as an important mechanism for tackling obsolete pesticides and PCBs. Importantly sub. Regional cooperation was highlighted as an effective way of exchanging data, experience and experts, training and also in approaching donors for support in capacity building and demonstrating cleaner technology.

Post Poznan Forum

- After the Poznan meeting, IHPA and others visited the European Parliament and talked to many politicians on the urgency of tackling the POP problems. In June 2001 the Committee on Environment , Public Health and Consumer Policy of European Parliament raised the issue of obsolete pesticides and in July after a lively debate, the Committee contacted ambassadors of ten accession countries to report on the government's estimation of the range and quantity of such stocks held and the plans how these may be disposed of.

- The well awaited Stockholm Convention on POPs agreed to develop national Implementation Plans (NIP) for implementing their obligations under the convention. The Stockholm Convention on POPs sets a high, protective standard aimed at reduction and elimination of environmental releases of POPs in order to protect human health and the environment Importantly GEF/UN agreed on a mechanism to provide financial support for development of NIP s and related enabling activities to GEF eligible countries. The German Minister for Environment Mr. Jurgen Trittin asked the participants to consider seriously the problem of obsolete pesticides in Central and Eastern Europe. Recently the 15 ministers of environment of the EU agreed to the draft of the 6th Environment Action Plan and for the first time obsolete pesticides in the accession countries have been made a priority issue in the programme.

- The Poznan Forum book is out and can be downloaded free of charge at the Forum website: www.6thHCHForum.com/book.htm

Contribution from UN Agencies

UNEP Chemicals work related to promoting cleaner technology to the disposal of POPs.

The work of UNEP Chemicals on POPs is centred on the recently adopted Stockholm Convention on Persistent Organic Pollutants, for which UNEP provides the interim secretariat. As of 19 March 2002, the Convention has been signed by 119 States and ratified by 6. It will enter into force after 50 ratifications. The Convention covers an initial 12 POPs -chemicals that are persistent, bioaccumulate and biomagnify, and adversely affect the environment and human health. Slated for elimination are the pesticides aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex and toxaphene. Continued use of DDT is permitted for disease vector control until

safe, affordable and effective alternatives are in place. In addition, the Convention covers several industrial chemicals and by-products: dioxins and furans, hexachlorobenzene and polychlorinated biphenyls (PCBs).

Under the Convention, disposal of wastes containing or contaminated with the listed chemicals is to be undertaken in such a way that the POPs content is destroyed or irreversibly transformed, or otherwise disposed of in an environmentally sound manner. Disposal must take into account international rules, standards and guidelines, and relevant global and regional legal regimes. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989) is particularly relevant in this context.

UNEP Chemicals' work at the country level includes assisting countries to: develop National Implementation Plans for the Stockholm Convention, formulate strategies for identifying stockpiled and waste POPs, develop action plans on the control and substitution of DDT, and develop action plans to reduce or eliminate POPs releases from unintentional production (for example during the disposal of other POPs). There is a requirement for release reduction measures that employ cleaner technology (best available techniques and best environmental practices), guidelines for which are to be adopted under the Convention.

Ongoing regional workshops and projects are also being organized by UNEP Chemicals to help countries prepare to meet the Stockholm Convention's requirements. These include:

- Advice for CIS and other countries on technologies for treatment/destruction of obsolete (POPs) pesticides and PCBs.
- A UNEP-Artic Council project aimed at the environmentally sound disposal of obsolete pesticides in Russia.
- An upcoming UNEP-Basel Convention pesticides workshop for Caribbean countries that will include waste and stockpile issues.

Supporting, along with other intergovernmental organizations and NGOs, a large-scale "Africa Stockpiles Programme" which aims to facilitate the disposal of tens of thousands of tonnes of obsolete pesticides currently stockpiled in African countries. Technology criteria are being developed for the programme in accordance with the provisions of the Stockholm Convention.

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UNIDO Preparing TOR for clean technology in the disposal of Africa Stockpiles Programme (ASP).

Most of the African Stored Obsolete Pesticides (ASP) have been exported for incineration in dedicated high temperature hazardous waste incinerators in Europe to be disposed of in accordance with international guidelines. It is also well established that incinerators can generate and release POPs in the form of dioxins and furans in stack gas emissions and in solid wastes such as fly and bottom ashes

The Africa Stockpiles Programme (ASP) aims to clear all obsolete pesticide stocks from Africa and put in place measures to prevent their recurrence. The concept of a continent-wide stockpiles project grew out of informal discussions between NGOs and several intergovernmental organizations. The objective of the ASP is to:

- Clean-up stockpiled pesticides and pesticide contaminated waste (e.g. containers and equipment)
- Catalyze development and implementation of prevention measures and
- Provide capacity building and institutional strengthening on important chemical-related issues.

Supported by GEF, UNIDO will soon take a lead to start a process that will establish Technology Terms of Reference (TOR) including criteria, guidelines and standards for technology selection, deployment, operation and monitoring under the ASP. It builds upon the document on Technology TOR that was tabled in Rome, February 2001, and should be read in conjunction with that document.

This is also muted by the fact that over the last 10-15 years a number of non-combustion technologies, some of them superior to incineration, have been developed that have been demonstrated to effectively treat POPs wastes (including pesticides) in countries such as Canada, USA, Australia and Japan. According to UNIDO, some of these technologies with a history of commercial operation have following characteristics:

- Have 100% destruction efficiency taking into account all inputs and releases to all media.
- Containment of all process streams to enable testing for 100% destruction efficiency
- Do not produce dioxins or other POPs as secondary products

Importantly the TOR will seek in addition to the above criteria, will demand that:

- A liability regime must be in place so that failures to comply with ASP standards have a consequence. If the failure is due to the characteristics of the technology, the vendor should be held liable. If the failure is due to the operating regime, the operating company should be held liable.

According to UNIDO, beyond addressing the immediate acute stockpiles problem, African countries will need to develop strategies for managing hazardous waste in the long term. This may involve the establishment of facilities in country wise or sub-regionally. The development of such strategies and facilities from scratch provides a unique opportunity to consider technology options other than the current standards of incineration and landfill.

An additional concern is the long distance transportation of obsolete pesticides and the risk of accident en-route. The consequences of a spillage of obsolete pesticides during overland transport would be extremely serious, while such a spillage occurring during marine transport would be devastating. One important question to be asked in the context of the ASP is: can this initiative stimulate a move towards a more sustainable non-polluting approach to hazardous waste management, and how far does ASP wish to go towards implementing such options?

The challenge facing the Technology TOR process will be to establish a high and protective standard as contemplated under the Stockholm Convention; but one that can be met by practical and cost effective means.

The proposed ASP Technology TOR Process aims to establish a single set of criteria, guidelines and standards to be applied whenever there is a proposal under the ASP to treat wastes with a significant POPs content in Africa under any of the following three circumstances:

- When there is a proposal to treat POPs containing waste in an already existing facility.
- When there is a proposal to modify an already existing facility so it can be used to treat POPs containing wastes
- When there is a proposal to construct a new facility to treat POPs containing wastes.

UNIDO will organize a workshop to discuss the ASP Technology TOR. The workshop might also establish task groups to address more technical matters after a more general framework and approach is agreed. UNIDO will then prepare a draft report based on the discussion of the workshop and subsequent, follow-up technical work.

While it is not expected that the ASP Technology TOR workshop will address and resolve all topics that will need to be addressed in the development of the ASP Technology TOR, it is expected that this workshop will be able to arrive at an agreed approach to many of the most difficult topics that will be applicable to all GEF eligible countries.

UNIDO will circulate the draft report to all workshop participants for consideration and comments. A final report then will be prepared and submitted to the ASP Partners for approval.

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Feasibility Studies:

With a view to assisting CEE countries in developing a systematic regionally coordinated approach towards obsolete pesticides, the Dutch Ministry of Housing, Spatial Planning and the Environment, has conducted a feasibility study from Sept 1, 2000 to March 1, 2001. The objective of the feasibility study was to make use of existing tools and research for handling obsolete pesticides and make funds better accessible. The feasibility study prepared by Mr. Sander Grip and Ms. Michal Oppenheimer of

the Ministry produced three products.

- Technical manual to make inventories of pesticides stocks and different ways to dispose of pesticides.
- Data base of funds that could provide financial support at addressing problems of obsolete pesticides
- Practical guidelines to write project proposals for funds mainly from the EU countries.

The feasibility study is focused on two countries, Hungary and Slovak Republic. This extensive 131 page document will be a very valuable tool for organizations working on obsolete pesticides and look for funds especially from bilateral sources. The document when finalized will be made publicly available.

News items:

Holy River Ganges in India gets bioremediation technology.

It is a strong belief of the Hindus that the holy river Ganges flowing across the plains of North India cannot be polluted and many Clean the Ganga (Ganges) projects in the past have been barely successful. Now a NGO organization is linking with a UK organization Thames 21, a group that has worked to dramatically improve the water quality of the River Thames in South England to start another Clean Ganga Project. The Ganges flows for more than 2,500 kilometres through several states in India, and in some ritual bathing areas on the banks of the river, pollution levels are 3,000 times the level safe for human beings.

According to the director of Thames 21, Mark Lloyd, the main source of pollution in the Ganges. Plans are unveiled for a cost-effective and safe system to clean up the stretch of the Ganges that passes through Varanasi. This plan is not reliant on electric power, which can be erratic at times. Instead, it moves sewage by the force of gravity, into ponds where it is treated biologically. This removes the pesticides, heavy metals and other strong pollutants. The technical name of the system is the Advanced Integrated Wastewater Oxidation Pond System, which has been used in the United States. (Source BBC, news).

Ghost of Vietnam war

Those who remember 1960s when America used Agent Orange in the Vietnam war, there was very little known about the dioxin contamination. Now after 30 years, the residues are having their impact on the environment and human health. US and Vietnamese scientists are holding their first conference in the Vietnamese capital Hanoi on the effects of the controversial wartime herbicide, Agent Orange. The conference is due to hear the findings of a US scientist who tested the blood of 43 people living near a former southern air base used as a depot for spraying the chemical. Professor Arnold Schechter, of the School of Public Health at the University of Texas, says the tests show that the people of Bien Hoa have high levels of dioxin - as high as 413 parts per trillion compared to a national average of just two parts.

- Is enough known about dioxin? That is a question the powerful US veterans' lobby wants answered.
 - Is it possible to identify and clean up the affected sites? That is perhaps multi million dollar question for Hanoi, which has had responsibility in the 25 years since the end of the war.
 - Importantly the conference will discuss as to how the victims can be helped. (source: BBC news)
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Kerala Bans aerial spray of Endosulphan.

Endosulphan is a chlorinated mixture of isomers but is not in the category of POPs and is a broad spectrum insecticide. While it is banned in some countries it is used in many countries with restrictions especially due to its aquatic toxicity. Suspicions about the pesticide endosulphan grew when an Indian environmental group carried out its own investigations in Kerala where endosulphan has been used as aerial spray on cashew nut plantations for more than 25 years. Its report recorded high levels of Endosulphan in the local water, soil and plant samples in many villages. Government action followed talks between the chief minister of Kerala and the Endosulphan Spray Protest Action Committee (ESPAC) of Perala village in the northern district of Kasaragode. ESPAC has campaigned for the past four years, highlighting the damage caused by the chemical in several villages. It says that the spray has caused wide spread health problems including cancers, liver disorders and hormonal problems. In one village many children were borne with abnormalities but direct links to endosulphan could be difficult to prove. At the same time when a small area was subjected to 25 years of aerial spraying with endosulphan it is difficult to relate side effects from laboratory studies.

The industry view is that this compound has been in use around the world for more than 40 years and it gets periodically evaluated. The villagers say that many of their houses are right by the cashew trees - so homes and water sources are bound to be affected by aerial spraying. There is a clear warning that endosulfan should not be used in catchments areas or near (within 25 meters) to the wells of villages. Managers at the cashew nut plantation would not comment - but spokesperson for the pesticide association did say aerial spraying of endosulphan is extremely unusual in India and not recommended by the industry clearly a case of misuse of proper application methods and lack of advice and supervision by the agricultural extension system. Kerala lies in the backwaters of the Arabian sea and is a major tourist spot well known for eco tourism and ayurvedic treatment. So it cannot afford contamination of its soil/water by toxic substances. (source BBC news)

Success of USEPA -XL Projects.

USEPA moved from the well known Super Fund projects for decontamination contaminated sites 1980-1990s to introduce, in the 1990s, a scheme to support XL projects. X stands for excellence and L stands for Leadership. The main goal is to promote new and innovative environmental strategies and technologies that are cleaner cheaper and smarter. According to the US EPA "if you have an idea that offers better results than what would be achieved under current requirements then we will with you and other interested parties to put those ideas to the test". The XL projects to get support should meet eight conditions:

- Superior environmental results
- Cost saving and paperwork reduction
- Stakeholders support
- Multimedia pollution prevention
- Transferability
- Feasibility
- Monitoring, reporting and evaluation.
- Worker safety

After facing many initial challenges due to XL requirements, now more than 50 projects or being implemented or in development phase. These XL projects have reduced air pollution, water use and disposal of solid and hazardous waste. Several XL projects promote to test new environmental technologies by removing barriers that once blocked them. An important project is called Weyerhaeuser Flint River Operation dealing with new air and wastewater regulation affecting pulp and paper industry called the Pulp and Paper Cluster Rule. This allows mills to meet stricter wastewater discharge limits by installing advanced technologies. It is expected that this rule along with other provisions will eliminate 59% of toxic air emissions from US pulp, paper and paperboard mills. Chloroform discharges to water will fall by 99% and dioxin and furan discharges will be reduced by 96%. XL projects also include bioremediation technology. For additional information please visit XL projects website: <http://www.epa.gov/projectXL>

Bio-bed filter to remove PVC odours.

An Italian company, SIC International has realized a complete new factory for Lucchesi SpA (Bologna - Italy), a company producing technological rigid PVC for credit cards. This was an investment of approx. 50 billion It. Lire, equivalent to approx. 26 million €, which included the installation of a state-of-the-art calendaring line of width 2.400 mm, one of the largest in operation in the world. To reduce the problem of PVC vapours from the calendaring line, a biofilter was installed, which consisted of an

underground tank of dimensions ca. 20 m x 8 m and depth ca. 1 m. The PVC vapours were forced through an organic bed of depth ca. 60 - 70 cm, kept wet by specially installed sprayers. The outgoing effluent resulted free from the intense PVC-odour.

Calendar of Events:

April 22-25, 2002 , Port of Spain, Trinidad and Tobago

Regional workshop on Reduction/elimination and management of pesticides in the Context of Stockholm Convention on Pops and the Basel Convention on the Control of Transboundary movement of hazardous wastes and their Disposal. Organized by UNEP. Contact person Mr. John Gubb - Email: Mgubb@chemicals.unep.ch

September 16-19, 2002 , Krasnodar, Russian Federation.

Subregional Training Workshop on inventories of Stocks of obsolete/Unwanted Pesticides. Organized by UNEP. Contact person Mr. John Gubb - E-mail: Mgubb@chemicals.unep.ch

September 9, 2002.

Waste for waste treatment: Society for Chemical Industry , U.K.

Venue : Belgrave Square, London.

Hundreds and millions tons of waste are discarded each year , some of this material could be recycled to treat other contaminated waste thereby achieving a true win-win situation.

(Contact person Prof. Harry Eccles- E-mail hel@bnfl.com)

November 18-21, 2001

The British Crop Protection Council Conference -Pests and Diseases ,

venue: Brighton, U.K.

For details: www.bccpc.org

Interesting quotes:

- "It will give peace of mind that comes from knowing that fruits and vegetables and grains they set down in front of their children are safe. Bad pesticides have stayed on the market to