POPs Newsletter

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Prepared on behalf of IHPA

Editor: B.Sugavanam, email: bsugavanam@yahoo.co.uk
Co-editor: Ivan Holoubek, email:holoubek@recetox.muni.cz
Co-editor: Mahbubar Rahman, email: drmahbubarr@gmail.com
Co-editor: Sushil Khetan, e-mail: skhetan@andrew.cmu.edu
Sub-editor for the Caucasus Region: Mr. Otar Kiria, Tbilisi, Georgia, okiria@caucasus.net

The aim of this newsletter is to disseminate information in a cost-effective way on the developments taking place in the area of POPs as implicated in the Stockholm Convention and other pollutants of concern. It will cover, among others, the news on science and technology for disposal of obsolete stocks and remediation of POPs contamination, which might be of interest for commercial exploitation both in developed and developing countries. Special emphasis will be given to bio-remediation, non-combustion related technologies which will benefit developing countries. The newsletter will not go into technical details of selected scientific publications but only highlight salient features for the benefit of the readers. One can subscribe and read IHPA Newsletter (2 times/yr free of charge) at http://www.ihpa.info/resources/newsletter/

Note from the Editor:

Since the last issue of the Newsletter our Director Mr. John Vijgen has been discussing with the editor ways and means of giving a new outlook to the Newsletter which will be completing 10 years of publication in 2011. We are trying to bring a team of young and energetic people, which can run the Newsletter to cover all regions of the world under one focal point. Our friend and IHPA Ambassador Prof. Dr. Md Mahbubar Rahman from Bangladesh has agreed to join the team along with a young expert team (from RECETOX, Brno) and Mr. O. Kiria from Georgia and Mr. Joao. Torres from Brazil will also join the team. During the course of next one year we will be building up the team to take over from the editor Dr. B. Sugavanam who managed the Newsletter using mainly the obsolete Windows 98. With technology having moved on to Windows 7/Vista/XP Professional/Apple.MAC/ipad, it is time we moved on to a new team so that the Newsletter can get a global outlook and a better sustainable future.
In this issue we are pleased to include a review article about pre-design of clean-up of pesticide storage sites in the Kyrgyz Republic, Republic of Tajikistan and The Republic of Uzbekistan implemented by TAUW of The Netherlands.

1. Central Asian World Bank POPs project

Mr Matthijs Bouwknegt and Mr Boudewijn Fokke, Tauw bv,
The Netherlands, boudewijn.fokke@tauw.nl, tel.+31 (0570) 69 9567)

This article is about the pre-design of a clean-up campaign of former pesticides storage sites and the rehabilitation of landfills with pesticides in the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan. The pre-design is made within the framework of the 'Obsolete pesticides technical study in the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan'. The Tauw Consortium, referred to as TC (Tauw bv Milieukontakt International, International HCH and Pesticides Association, Witteveen+Bos Environmental Consultants and Green Cross Switzerland) was selected by the World Bank in May 2009 to execute this project.

Badly maintained, mostly private owned, former pesticides storage sites and pesticide landfill sites are present in the selected oblasts (provinces) of the project countries. These sites mostly contain Obsolete Pesticides waste and Persistent Organic Pollutant Pesticides (referred to as OPs) [1]. The topsoil at these sites is also in many cases contaminated.

Photo 1 Child playing with DDT at a pit with Obsolete pesticides close to living quarter

The situation at the different former pesticides storage sites and the landfill sites poses a direct and unacceptable threat to public health and the environment. Photo 1 is a picture of a small child playing with a lump of DDT close to his home at a former pesticide storage site in the Kathlon oblast in Tajikistan. Urgent measures have to be taken. It is important to mention that in March 2010, just in the final stage of this World Bank project, 35 cows and 12 sheep died after drinking OPs contaminated standing rainwater at one of the landfill sites, in the Kyrgyz Republic. The cattle owners quickly sold the contaminated meat, which resulted in the hospitalization of 20 consumers. This sad incident underlines the seriousness and urgency of measures to be taken to eliminate the acute risks. Photo 2 is a picture of a dead cow which died after drinking water from contaminated stagnant water at the Vakhsh burial site also located in the Kathlon oblast in Tajikistan.

In order to come up with a group of well-balanced, sustainable and cost effective measures to eliminate these risks the TC made an assessment. This assessment is based on risk reduction, the environmental merits and costs of cleanup measures of around 50 former pesticide storage sites and four rehabilitation alternatives for all four landfill sites.

[1] The term OPs is used for all the obsolete pesticides waste including persistent organic pollutant pesticides. This term is used because the pesticides encountered are a mix of obsolete pesticides waste and persistant organic pollutant pesticides that cannot be separated

The TC proposes to eliminate the acute risks at the 50 former pesticide storage sites and the four-landfill sites in an integrated approach on the short term. The remaining risks should be addressed on the mid term and long term.

Proposed short measures to eliminate the acute risks
To reduce the acute risks at the high priority storage sites on the short term, the OPs should be repacked and removed to be stored at the Intermediate Collection Centers or contained at a proper managed and maintained landfill sites, followed by on-site[2] and/or in-situ[3] destruction as soon as possible. The identified severely contaminated topsoil at the former pesticides storage sites should be excavated and also brought to the landfill sites for treatment as soon as possible.

The short-term measures at the landfill sites comprise gathering and containing of the OPs laying in the open air at the landfill sites. The next steps of eliminating the acute risks are proper containment in trenches, followed by on-site and/or in-situ destruction of the OPs as soon as possible.

In addition to the containment of the OPs and severely contaminated soil awaiting destruction and treatment, the TC is convinced that it is very important to install proper management and guards at these landfill sites to prevent waste mining and to ensure proper containment until final destruction of the dangerous materials is accomplished. In order to keep trespassers and cattle safely away from the site and to reduce further risks, it will be necessary to fence these landfill sites. Very important additional short term measures are reinstalling the old surface drainage and implementing erosion control measures.

On-site and/or in-situ OPs treatment techniques (e.g. vitrification, thermal desorption, and Supercritical Water Oxidation (SCWO) with Base Catalyzed Decomposition (BCD)) seem to be the most suitable and robust techniques. Of special interest could be vitrification as it combines soil remediation and destruction of OPs. To vitrify one-third of OPs, two-thirds of (contaminated) soil is needed as a matrix.

On-site and/or in-situ destruction of all OPs and remediation of contaminated soil seems the most cost effective, final and sustainable solutions. But within the available GEF and country project budgets only destruction pilots are feasible. There is no budget for the destruction of the all identified OPs and severely contaminated soil. Therefore TC strongly recommends that the authorities apply for additional funding for the destruction of all remaining OPs and contaminated soil.

If site management is operational until the authorities have enough funding for in-situ and/or one-site destruction, the costs of the final and sustainable solution are limited to the management, containment and destruction costs. Extra costs for repackaging, transportation off-site and safe storage are then saved and the saved money can be spent on in-situ and/or one-site destruction of OPs and remediation of severely contaminated.

[2] On-site destruction:The materials are excavated and/or collected at the original site. A destruction plant is then brought to this site for on-site destruction
[3] In-situ destruction: The materials are not excavated or removed, but destroyed at the place where they are found in their orginal state (e,g. buried). An installation is brought to the site where the materials, as they are, are destroyed.

Photo 2. Dead cow at the Vakhsh burial site in Tajikistan

Proposed middle and long term measures to eliminate the remaining risks

Besides the high priority storage sites, there are also low priority sites in the Central Asian projects countries. These low priority sites have limited amounts of contaminated topsoil, stored and buried OPs. The TC proposes to further survey the topsoil and the pits with OPs at these sites to assess the quantity of contaminated soil and OPs. Based on the results of these surveys, site cleanup plans can be made. Mid and long term measures at these storage sites include excavation, removal and off-site bioremediation of (severely) contaminated soil at the landfill sites, and on-site (storage site) phytoremediation of slightly contaminated soil.

The middle and long-term measures at the landfill site comprise maintaining proper site management, containment of OPs and contaminated soil. When funds are available followed by in-situ and/or on-site destruction of the remaining volumes of the severely contaminated soil and OPs. The remaining contaminated topsoil will be remediated by on-site bioremediation and phytoremediation.

2. An SOS from Armenia

The Problem of the Nubarashen Burial Site is on the way to be solved. The Office of OSCE in Yerevan is lending support

The Nubarashen burial ground of obsolete and POPs pesticides is threatening to cause a serious anthropogenic and ecological catastrophe. The emergency situation has occurred because unknown persons have completely removed the cover of the landfill and now pesticides waste is lying open. Danger due to direct contact for humans and animals and contaminating the surface water towards environment in the valley and the nearby villages is possible. There is an urgent need to remove and dispose off the huge amount of pesticides buried in this site. But this is not as easy as it seems to be done. To implement all waste and contaminated soil safely and professionally, a huge amount of finances is needed. Now the RoA Ministry of Emergency Situations together with the Yerevan Office of OSCE is undertaking concrete steps towards the fundraising and the immediate solution of the problem.

A feasibility study of the area of the Nubarashen burial ground will be developed by the Yerevan Office of OSCE. According to this program the technical state of the storage, contamination of soil, groundwater and air, risk of landslides supported by the

necessary chemical laboratory analysis will clarify the situation of the territory, Also recommendation for gender-related health and exposure risks related to the burial of pesticides which will be included and lead to recommendations on further steps to be taken. It may be clear that due to the unexpected emergency situation a number of steps will be implemented soon.

On April 12, 2010 a group of specialists from the OSCE visited to the Rescue Service of Armenia to discuss the problem. In the discussions participated representatives from different departments, international and non-governmental organizations, as well the experienced international obsolete and POPs pesticides expert John Vijgen of the International HCH & Pesticides Association, who was invited by the Yerevan Office of OSCE within the framework of the project "To assist with the disposal of the Nubarashen burial ground".

Discussions took place about this emergency situation in the Nubarashen burial ground. To prevent worsening of the situation, it was suggested that a number of ad. hoc activities should take place to reinstall first the broken and with waste covered drainage system followed by a provisional capping of the burial. These actions then enable to plan further works for the final excavation and destruction of the waste and contaminated soil. It is also necessary to inform the population and bring awareness about risks and their avoidance and install permanent guards. The international expert John Vijgen suggested that the Ministry of Emergency Situations should apply to the Yerevan Office of OSCE and the UN Agencies in Armenia with a request to provide funds for the implementation of the activities.

The same day Armen Yeritsyan, the Minister of MES, Edik Barseghyan, the Chief of the Rescue Service of Armenia and Sergey Kapinos the Ambassador of the OSCE met. The problem of Nubarashen burial ground was discussed and the ad hoc plan proposed for the problem was considered to be of utmost importance

The Nubarashen burial ground of obsolete pesticides was constructed earlier in 1982 but the constructors had considered neither the site conditions nor the safety rules. They had just excavated at a depth of 5 meters and buried the obsolete pesticides amounting to 512 tons, mainly DDT, in bags and containers just placing them one over the each other. As the burial ground is located in the active landslide locality, the burial area and its content has been continuously sliding downwards to the nearby territories for almost 30 years. In the vicinity of the burial ground are located not only the villages Jrashen, Geghanist and Moushakan, but also the storage of the indigenous and unique Armenian wheat. The length of the burial ground is 100m, the width is 20m, and the depth is less than 5 meters. The approximate volume is not clear but can vary a lot and be easily much more than the present estimate. This is in strong contrast with the original estimate of 512 tons. In 2004 reconstruction works of a drainage system were implemented in the area of the burial ground that reduced the landslide process to some extent. The area was fenced and the signs prohibiting the entrance to the territory were placed. However, the posts with barbed wire fence were destroyed in some sections by the people, the barbed wires were cut and the prohibition signs disappeared.

On May 15, 2008 a case of excavation of the burial ground was registered that was reported to the RoA Police Department of Erebouni community. The police concluded that heavy machinery was used for excavating the burial ground. Three holes were excavated; two of them reached the upper layer of the buried pesticides. The pesticides were taken out and scattered over the surface of the burial ground. Thereafter, measures were undertaken to rebury the excavated pesticides and the damaged section of the fence was restored.

On March 4, 2010 another case of excavation of the burial ground was reported. The upper layer of the burial ground was completely damaged, the pesticides of the upper layer were excavated and scattered around an area of more than 3000m², the drains were filled with waste and could not serve their purpose anymore, the posts with barbed wire fence were torn down and the gate was destroyed. A big environmental damage was caused to the territory, and a real threat of emergency situation occurred. The Ministry of Emergency Situations has appealed to the Chief of the Police of Armenia.

According to the preliminary conclusion of the experts the disposal of the buried pesticides should be executed in 4 stages.

The first stage, as described before contains a number of ad hoc activities such as the reinstalment of the broken drainage system followed by a provisional capping of the burial.

In the 2nd stage, the investigations by means of drillings have to be made to determine the quantity of and contents of the pesticides waste and contaminated soil. After the real quantities have been quantified, the possible strategies on the repackaging of waste, heavy contaminated soils and transport of low contaminated soils can be made, as well as the final treatment. The possibility of treating the material (on site= at the Nubarashen site) has been excluded due to the danger of the area which can also occur during treatment.

In the 3rd stage, it is planned to carry out excavation activities, identification and further classification of waste and soils streams, packaging and transportation, to a suitable store for temporary storage for pesticides waste and eventually a depot for the low contaminated soil, as well as the re-cultivation of the area.

In the 4th stage, selection of the disposal alternative is planned. In this phase, for waste and heavy contaminated soil, different options can be considered such as: export and destruction in dedicated hazardous waste incineration plants in the EU or depending on the quantity of waste, a smaller treatment plant could be shipped to the storage site in Armenia, where the material could be treated. For such destruction in Armenia, an Environmental Impact Assessment has to be made. For the low contaminated soil, bioremediation methods in Armenia can be used.

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The elimination of the pesticides waste and the low contaminated soils is planned to be carried out in the 5th stage. Along with this a number of monitoring works have to be implemented such as: soil, and water monitoring, landslide progress, vegetation, cattle and humans in order to ensure if damages to environment, animals and human have occurred or are taking place.

The buried pesticides of the Nubarashen burial ground are classified as compounds belonging to the I and II hazard categories. According to the official documents the amount of the buried pesticides is about 512 tons. But this amount can turn out to be much more after the investigation in the first phase and finally during the removal of the pesticides. On the 15th of April, 2010 the working group under the leadership of the Deputy Head of the Yerevan Office of OSCE Carel Hofstra and the Minister of the MES Armen Yeritzyan and the experts of the Ministry of Agriculture, visited the Nubarashen burial ground. They investigated whether or not the ad hoc plan drafted could be realized in the field, and were finally convinced that the plan could be realized and should be started as soon as possible. It should be stressed that due to the strong engagement of OSCE and Ministry of Emergency Situation these actions have been made possible.

Thus, the first stage, i.e. the study of the burial ground, the development of a working plan has already commenced. As for the remaining steps, in order to get support to organize the excavation of the pesticides, transportation and the final elimination, the Armenian Government, has now made available 30, 000 US Dollars for the first phase, but should urgently apply to bilateral donors and the international organizations, to find sufficient financial support to implement all other necessary works in the next phases.

It should be mentioned that due to the intensive efforts of the Armenian NGO (Armenian Women for Health and Healthy Environment (AWHHE http://www.awhhe.am/index.html) to draw international attention, for more than a decade, there is now a possibility that the problems of the burial will be dealt with in the near future.

3. Another burial site of POP s in Kalush Area, Ukraine.

A UN.OCHA Technical scoping mission in a detailed document discusses the problem of mine waste and hexachlorobenzene (HCB) buried in a industrial site that used to produce carbon tetrachloride and ethylene tetrachloride that produced more than 11,000 tons HCB side product. For more details see http://ochaonline.un.org /ochaunep . IHPA has been drawing large international attention during the 10th Int. HCH and Pesticides Forum in Brno, last year urging that actions have to be taken for this ticking time bomb

4. Another year of Roll Back Malaria Programme

In our issue No.17 we published a main review article on Malaria to commemorate the 10th anniversary of Roll Back Malaria programme. Now again the Financial Times on April 23, 2010 came up with a 6 page review on progress in Malaria control. This year the UN special envoy on malaria says “today we know we can achieve the goal of universal coverage of mosquito nets by the end of the year and near zero deaths from the disease by 2015”. Imaginative advocacy has increased funding from $60 million to $2 billion annually. Great footballers from Africa have launched a match “Footballers Vs Malaria 2010.” Ethiopia, Ghana, Rwanda, Zambia and Zanzibar cut death and disease by up to 70 percent in recent years. On the other fighting strategy, vaccination against malaria is underway with RTS.S vaccine, which took almost 20 years to develop according to Glaxo Smith and Kline. Totally more than $300 million have been spent mainly given by Bill & Melinda Gates Foundation. Another front against malaria is from prevention to cure by making available array of drugs combination to

avoid resistance and treating the most virulent type of malaria caused by *plasmapodium falciparum.* The difference between *falciparum* malaria and *vivax* malaria is the former is predominant in Africa while the later is predominant in Asia. In some countries clinics are very few and far between but churches and mosques are plenty. So in Nigeria in some places mosques and churches are used as health centres where one can seek both spiritual healing and malaria protection and healing.

Mixing of the two populations of mosquitoes are producing new type of malaria which might be resistant to old and new drugs. Another fear is that China, the main supplier of Artemisinin drug, will be running short of supplies due to drought in South West China and reduction in the price over the past two years ($ 1200/kg in 2006 to $150 in 2008) making the farmers switch to more profitable crops. Resistance to ACT (Artemisinin based Combination Therapy) has been noticed in Thailand/Cambodia region. So, the next challenge in the current scenario is not to depend on one plant Artemisea and control resistance spreading. Added to all this is the robust and simple method of diagnostic tool. The major problem facing mankind in the fight against malaria is donor fatigue, complacency, lack of education and above all demotivated staff. In Burma (now Myanmar), the border between Burma/ Thailand /Cambodia is well known for resistance development against anti-malarial drugs including ACT. Treating the patients gets into international politics while resistance species have no respect for international borders. So the review article concludes with a statement from its South Asian Correspondent "we have the tools, the drugs, even the money. The only problem is the politics"

Malaria did not spare Tutan Kamun of Egypt

Who would have thought that Tutan Kamun, the great legendary king of Egypt who died at an young age of 16 more than 5000 years ago, was probably struck by malaria according to a recent finding by forensic studies on the DNA taken from the mummified original Tutan Kamun (*BBC World News , April 2010.)*

We want to end this news on Malaria by quoting Bill Gates of Microsoft *"Rich people spend more money on their own problems, like baldness, than they do to fight malaria." Bill Gates made this remark criticizing Italy's low levels of foreign aid with a passing remark on Prime Minister Silvio Berlusconi (Time USA, Quotes)*

5. Plastic recycling

The US Army has commissioned the construction of two new railroad bridges made almost entirely from recycled plastics taken from household items including milk jugs, detergent bottles and car bumpers. The bridge can take up to 130 tons sufficient to transport locomotives and freight traffic. Such bridges from recycled plastics do not rust save literally ton so waste plastics destined to landfills. (Chem and Ind. Feb.2010).

6. Obsolete Pesticides

Now the Russian version of the "Obsolete Pesticides "A Ticking Time Bomb and Why We Have to Act Now" Book, which was released in Brno at the 10th Forum is available.

7. Meeting in EU parliament to discuss the dire situation of Obsolete Pesticides in Central Asian and the Caucasus Regions.- Invitation from the Director of IHPA

Dear All,

Subject: Invitation to join – a Mini Hearing on Obsolete Pesticides in the European Parliament on 29 of June 2010

We have the pleasure that the Members of the European Parliament. Ms. Ria Oomen-Ruijten and Ms. Esther de Lange are organizing a Mini Hearing on Obsolete Pesticides in Eastern European countries, Caucasus and Central Asia Countries, in the European Parliament from 14.00 till 17.00 on 29 of June 2010 in Brussels. A room for 160 people has been reserved for the event.

The recent developments of extremely dangerous situations in Ukraine (Time Bomb news), Armenia (Emergency situation) and Kyrgyzstan (death of 20 cows and hospitalization of 20 people due to eating of the poisoned cow meat) are reasons to organize this debate and discuss common strategies as to how to work on a structural plan to solve the obsolete pesticides problem in the coming decade in the region

We are encouraging to participate in the very important debate. You can participate by sending the following information to Mr. Hubert Beusmans assistant of Ms. Ria Oomen-Ruijten at ria.oomen-ruijten@europarl.europa.eu

First Name; Surname; Birthday; Address; Email address

If you send these data, a pass will be prepared for entering the EU Parliament and you will get an official information. The debate will be in English. There is no funding for travelling available

8. New members of the Team

We are pleased to inform that Prof. MD Mahbubar Rahman who is well known to IHPA members, is the new member of IHPA Newsletter team. He is also an IHPA Ambassador.

Prof. Md. Mahbubar Rahman was born in Bangladesh and after finishing B.Sc. Hons Ag and M.Sc. in Bangladesh, he did his Ph.D. in pesticide toxicology at the Indian Agricultural Research Institute (IARI) in New Delhi and his post-doctoral research at the University of the Philippines at Los Bänos. After working in various capacities in different institutions including the university in Bangladesh and training in FAO on obsolete pesticide management and IPM he became Professor (Pesticides Toxicology) in Entomology at the Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU - www.bsmrau.edu.bd) in 1996 in 2000. He has been teaching and conducting research on Environmental Toxicology of Pesticides, Pesticides Toxicology and IPM and also worked in Kabul on IPM as FAO consultant. He has many M.Sc. and Ph.D. students working with him and has published a number of papers including a contributed chapter in the Radcliff's World IPM Textbook published by the Minnesota university, USA and has been nationally and internationally involved in aspects related to pesticide safety. Presently he is also one of the IHPA ambassadors. We warmly welcome him to join the Newsletter as co-editor and will initially cover the Asia region.

We also welcome Mr. Joao Paulo Machado Torres (jptorres@biof.ufrj.br), Associate Professor at the Instituto de Biofisica of the Universidade Federal do Rio de Janeiro (UFRJ) who will cover Latin America

In addition we are expecting three professionals to join the team from RECETOX, Brno, Czech Republic.
Dr. Michael Bittner, Ph.D. (bittner@recetox.muni.cz), Dr, Jiri. Novak, Ph.D. (novakj@recetox.muni.cz) and Ondrej Mikes, MSc., all from RECETOX, Masaryk University Kamenice 3, Brno, CZ62500 Czech Republic

Finally, we welcome Ms. Gulchehra Aliyeva (gulchehra_76@yahoo.com), Deputy Chairman ECORES Environmental Analytical Agency (NGO) in Azerbaijan.

9. Note from the IHPA Board:

The members of the Board of IHPA want to express their highest gratitude to Dr. Sugavanam for a decade of editing the IHPA Newsletter. Dr. Sugavanam has started just with a simple idea of disseminating information on obsolete and POPs pesticides and all other POPs. The newsletter has become now an important instrument of exchange and so far reached more than 2000 persons and a number of international communications have been established by Dr. Sugavanam's work. We hope he will still remain involved and write now and then a nice article. Thanks very much for his great work. We hope that the new team gives the letter a greater boost for the future