

# POPs NEWSLETTER

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PREPARED ON BEHALF OF IHPA

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The aim of this newsletter is to disseminate information in a cost-effective way on the Development 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 bioremediation, 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/>.

## CONTENTS:

### 1. PRESS RELEASE

#### MEMO TO ALL FORUM PARTICIPANTS

### 2. NEWS FROM THE SPONSORS OF THE 12 TH INTERNATIONAL HCH AND PESTICIDES FORUM AND INVITATION TO YOU TO MEET THEM AT THEIR STAND:

#### 2.1. S.I. GROUP (CONSORT) COMPANY PROFILE

#### 2.2. EDL - A SUCCESSFULLY COMPLETED PROJECT IN VIETNAM

*Marcus Glucina [marcus@pcasiahk.com]*

#### 2.3. GREEN TOX

*Margret Schlumpf and Walter Lichtensteiger*

#### 2.4. POLYECO

*Sofia Falida*

#### 2.5. PORT SERVICE SP. Z O. O., GDAŃSK

*Daniel Naumann <Daniel.naumann@portservice.com.pl>*

#### 2.6. SARP INDUSTRIESHAZARDOUS WASTE SERVICES

**A PART OF VEOLIA ENVIRONNEMENT GROUP**

*Aurélie Dauvais <ADAUVAIS@sarpindustries.fr>*

#### 2.7. SAVA

*Jaroslav Surma, jaroslav.surma@remondis.de*

#### 2.8. SÉCHÉ ENVIRONNEMENT / TREDI / UTM

*Christoph Rittersberger <c.rittersberger@groupe-seche.com>*

### 3. IMPROVING THE SAFETY OF INDUSTRIAL TAILINGS MANAGEMENT FACILITIES IN UKRAINE

**INTERVIEW WITH GERHARD WINKELMANN-OEI, GERMAN ENVIRONMENT AGENCY**

### 4. PROJECT INFORMATION UPDATED: JULY 2013

### 5. ALTERNATIVE METHOD FOR THE CHEMICAL TREATMENT OF METHYL BROMIDE

*Wolfgang A. Schimpf*

### 6. DESTROYING DANGEROUS PESTICIDES IN MOLDOVA

### 7. DIOXIN IN COW'S MILK

*Bala Sugavanam*

### 8. PESTICIDE TRAGEDY IN INDIA THAT KILLED MORE THAN 20 SCHOOL CHILDREN

*Bala Sugavanam*

# P R E S S   R E L E A S E

This project is co-funded  
by the European Union  
Tbilisi, Georgia, 17-20 September 2013

3

Environmental Management Plan  
International Training  
under  
The EU and FAO partnership project

“Improved pesticides and chemicals management in the Former Soviet Union”

From 17 to 20 September, FAO will hold training on development of environmental management plans for environmentally sound management of obsolete pesticides in Tbilisi, Georgia. The training will be immediately followed by a meeting of the Programme Technical Committee (PTC) to assess progress in implementation and to start preparations for the second annual Steering Committee meeting to be held in Kiev November 11 and 12.

The training and PTC meeting will be attended by representatives from Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, and Ukraine as well as representatives of programme partners including Milieukontakt International, Green Cross, and IHPA. The participation of representatives from Georgia, Kyrgyzstan and Tajikistan will be supported by the UNEP project “Demonstrating and Scaling-up of Sustainable Alternatives to DDT in Vector Management Global Programme”.

Both projects aim to reduce the risk from obsolete pesticides on public health and the environment in the former Soviet Union.

The training aims to strengthen the capacity of governmental specialists in the development of plans to reduce risks from hazardous materials such as obsolete pesticides and persistent organic pollutants (POPs). During the training participants will learn and work on an Environmental Management Plan (EMP) for the environmentally sound management of obsolete pesticides and associated wastes based on work already completed on identification of pesticide / POPs storage and burial sites. The EMP provides the base for a country to decide on risks, priorities, strategies and approaches to deal with its stocks of obsolete pesticides. It is expected that during and after the training participants will be preparing their country’s Environmental Management Plan.

Since early 2012 the twelve countries in European Neighborhood, Central Asia and the Russian Federation have been working with FAO to develop capacity to better manage their vast stocks of obsolete pesticides and POPs.

The programme is funded by the EC Europe Aid and implemented by FAO in partnership with a range of development partners including international NGOs (Milieukontakt International, Green Cross, and the International HCH and Pesticide Association), UN Agencies (WHO, UNEP, UNDP, the Secretariats of the Convention of Rotterdam, Stockholm and Basel) the Global Environment Facility, International Financial Institutions, bi-lateral donors and the private sector. For the next three years, the EU and FAO will invest €7 million to assist these countries and to foster an environment of cooperation and capacity development aimed at developing a sustainable solution of the project facing these countries. It is estimated that over 200,000 metric tons of these hazardous chemicals exist in the region and a concerted international effort is needed now to prevent contamination of water and soil used for production of food. At the same time, the project will build capacity to reduce risks from pesticides used in agriculture and avoid build-up of additional stockpiles in future.

For more information, please contact:

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## Memo to all Forum Participants

Dear Forum participants,

We like to remember you that we are near to the deadline 31<sup>st</sup> of August for the submission of your abstracts!!.

Please try to stick to these dates:

Here they are listed as indicated on the forum website <http://www.hchforum.com/1stAnnouncement.php>

**Summary of dates for submissions:**

**Registration – September 30, 2013**

**Abstract submission – August 31, 2013**

**Full Paper submission – September 30, 2013**

### Conditions of participation, Registration Fee

- Submitting the electronic Registration Form is required if you wish to participate in the Forum and have your oral or poster presentation included in the Forum schedule.
- The Forum participation fee is € 200,-. The fee has to be paid during the electronic registration. This covers participation in all presentations, coffee breaks, lunches, welcome reception and dinners, field trip, site- which includes the book of abstracts and later delivery of the electronic version of the `Forum Book`.
- **Please remind: Participants that have only registered and not paid will be deleted from the registration!**

### Contacts:

If you have any questions concerning the Forum please contact the Forum Secretariat:

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[back](#)

## 2. NEWS FROM THE SPONSORS OF THE 12TH INT. HCH AND PESTICIDES FORUM AND INVITATION TO YOU TO MEET THEM AT THEIR STAND:

### S.I. Group (Consort) Company Profile

“S.I. Group (Consort)” was founded in 2007 by few Israeli entrepreneurs. From the early beginning, the main goal of the company has been the management of toxic and dangerous wastes. It started operations in different parts of the world, however the former USSR, particularly Ukraine, was chosen as the priority area. The interest of the Group management to this market can be easily explained, taking into account big quantities of toxic wastes in the area and high qualification level of the local staff. Last, but not least – the State of Ukraine has had the strong will to clean up its territory from the obsolete toxic chemicals.

Since being founded, S.I. Group has managed to become one of the leading waste management operators in the region. Company provides to its clients, which includes the Governmental bodies, Oblast Administrations, foreign and local companies, the full range of services. That includes inventory, digging, repackaging, logistics and waste disposal or destruction. From 2011 the Company was directly involved into the Ukrainian National Program on toxic waste disposal. During this time S.I Group managed to organize the complex handling and destruction of 23738 MT of obsolete pesticides, 12915 MT of Hexachlorbenzene (HCB), 2834 MT of Mononitrochlorbenzene (MNCB) and 272 MT of Beryllium containing wastes. Such impressive results has brought Ukraine to the leading place in the world in cleaning its territory from the dangerous substances.

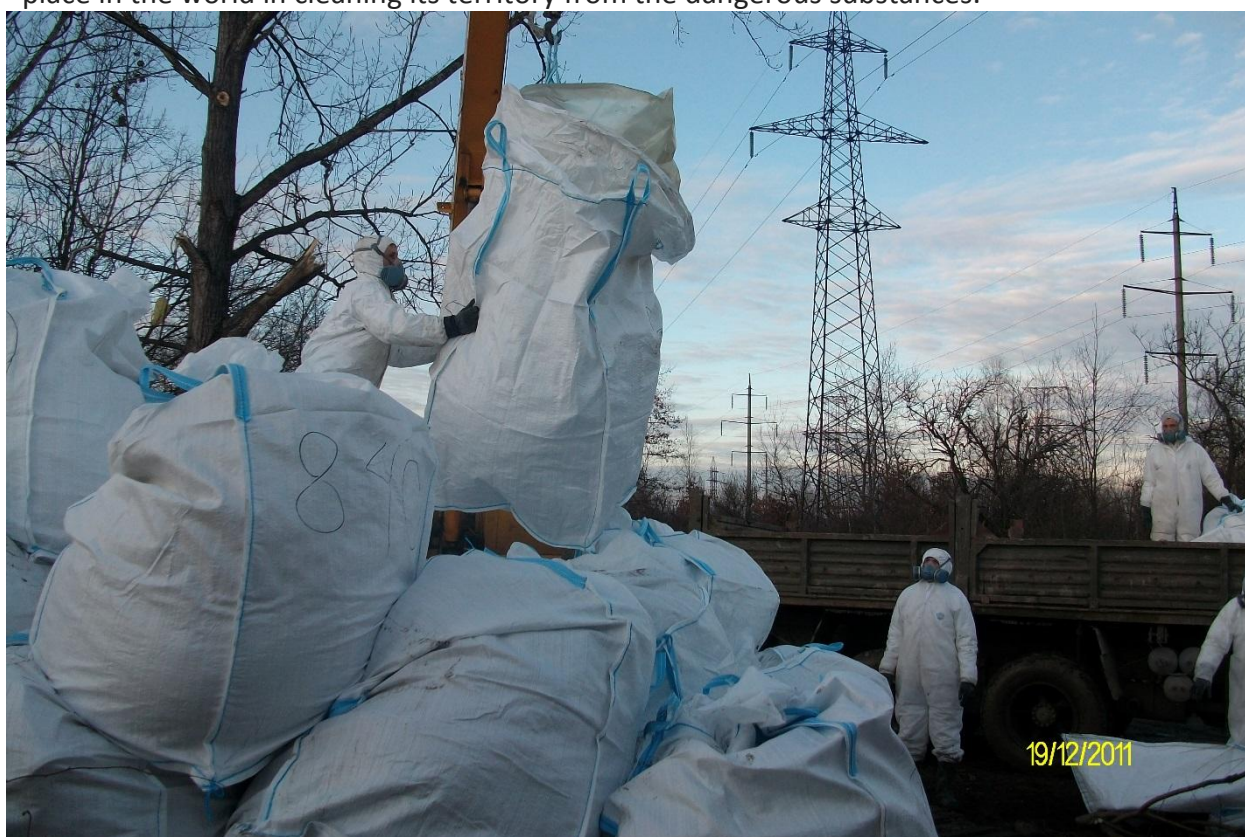


Figure 1 Preparing Big Bags with HCB for transportation from Kalush

Needless to say, that such work has not been possible without proper scientific and engineering support. S.I Group has established partnership relations with the major National



and International R&D centers, including National Academy of Science of Ukraine and several top International waste management operators. Such background helps the Company always to show the highest quality of the completion of different tasks, including the handling and management of the most dangerous wastes (MNCB for example). Quality of the works, completed by S.I. Group, has been many times confirmed by both National and International Inspections (including FAO mission).



Figure 2 Collecting MNCB containing waste in Gorlovka

However the logics of the current waste management market development shows the necessity of existence of the own waste destruction facility to any waste management company. Therefore S.I Group has decided to construct two hazardous waste management centers, multimodal moth by type of waste and method of its transportation. Both centers will include incineration facility for destruction of toxic wastes.

Of course, these plans have the solid financial and marketing background. That is why few neighboring countries are expressing their interest in inviting S.I Group to manage hazardous wastes on their territories. That is why major European waste management companies are expressing their interest in cooperating with S.I. Group. And finally that is the reason why S.I. Group has the right to use the words “We Work In Order To Make The World Better!” as the Company slogan.

**“S.I. Group (Consort)”: “We Work In Order To Make The World Better!”**

[back](#)



## A Successfully Completed Project in Vietnam

Marcus Glucina [mailto:[marcus@pcasiahk.com](mailto:marcus@pcasiahk.com)]

A New Zealand company, Environmental Decontamination Ltd (EDL), has just completed a very successful project in Vietnam. The project, a joint effort funded by international agencies piloted the removal of toxic chemicals from soil and is the first part of a much larger environmental restoration programme. The success of the project showcased NZ's innovative engineering, the KIWI "CAN DO" ATTITUDE to implementation and our concern for the environment.

The highest and most complex dioxin residue levels in Vietnam have been measured at Bein Hoa airport. The project "*Environmental Remediation of Dioxin Contaminated Hotspots in Vietnam*" funded by the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP) piloted our unique balling milling process known as mechano-chemical destruction or "MCD Technology". The pilot involved the treatment of 100 tons of highly contaminated soils at the Bein Hoa airbase.



Photo: Pilot MCD Ball Mill plant in Bein Hoa airbase

The project was successfully completed in late 2012 with an independent review now completed. The conclusions and recommendations from the demonstration:

1. The MCD™ process demonstrated the capability of destroying dioxin contaminated soils;
2. Highly contaminated soils (up to 30,000 ppt TEQ) were successfully treated; and
3. Costs of US\$500 per ton have been indicated to clean up the anticipated 300,000 tons of contaminated soils located at this military base.

**COME AND TALK TO US ABOUT YOUR SOIL/CONTAMINANT PROBLEMS THAT CAN BE SOLVED IN-COUNTRY – NO EXPORT REQUIRED.**

[back](#)



## **Come to our Session: Exposure and Toxicities of Pesticides**

**We bring you the new results of pesticides effects and exposure:  
Cancer and neurodevelopmental and endocrine disrupting activities of the  
obsolete pesticides.**

**Green Tox means: Group for Reproductive and Endocrine and Environmental  
Toxicology**

**Green Tox supports mentally and financially the strategy of elimination and  
destruction of obsolete pesticides in order to protect and save precious life**

**We are available at the session for questions and information**

**Walter Lichtensteiger and Margret Schlumpf**

[back](#)



**We take care of the environment for you...**

POLYECO S.A. is the oldest and largest Waste Management & Environmental services contractor in Greece. Our company was established in 2001 by Environmental Protection Engineering S.A. (est. in 1977).



The group of companies currently employs approximately 280 employees with high technical and scientific qualifications and diverse specialties, such as Chemists, Geologists, Chemical Engineers, Mechanical Engineers, Environmental Engineers, Oceanographers, Logistics, Electronics Engineers, Maintenance Engineers and others. The annual turnover of the companies exceeds 35 million Euros.

Within our facilities our accredited and certified laboratory is operating, enabling us to analyze with precision various waste samples. Based on the utilization of our laboratory we offer tailor made solutions to all our customers and also management plans, in order waste to be managed in the most effective and sustainable method, either through recovery in Greece or final disposal at an accredited EU Final Disposal Facility.

By continuous investments in research, development and implementation of new technologies, POLYECO holds a leading position in the local and international market for services in hazardous waste management and remediation of contaminated sites.



POLYECO, since establishment has managed more than 350.000T of hazardous waste, is a member of EUCOPRO and has significant experience in the production of alternative fuels from industrial hazardous waste and their recovery through co-incineration in cement industry.

In 2009 POLYECO S.A. began its expansion abroad and successfully delivered hazardous waste management projects awarded by International Esteemed Organizations, placing POLYECO S.A. amongst the most reliable hazardous waste management companies in Southeastern Mediterranean Region. The company has established subsidiaries in Albania, Serbia, FYROM, Kosovo and in process in Ethiopia.



OPs project in Ethiopia



POPs management in Mauritius



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[back](#)



## **PORT SERVICE SP. Z O. O., GDAŃSK**

*Port Service is a company with long tradition, established in 1957 as a cooperative providing services connected with protection of marine environment.*

*In 1970s the cooperative was transformed into state-owned enterprise. The scope of services included supply of drinking water, storage services, as well as removal and utilization of ballast water in the treatment plant commissioned in 1980 in Northern Harbor.*

*Essential organizational changes began since 1994. The legal status of ground in Northern Harbor was settled and the lease contract was concluded for 30 years.*

*The scope of provided services was extended in accordance with market economy conditions. The company went into partnership with a foreign investor.*

*Thanks to considerable capital invested by the German partner the company could purchase modern, unique equipment and implement the modern technology: cleaning tanks containing petroleum products, cleaning water supply and sewage systems, including TV monitoring. Port Service was transformed from pure marine enterprise into the company carrying out professional orders of demanding inland clients.*

*Modernization of thermic plant of utilization of dangerous waste began in 2000. The first modern incinerating plant for dangerous waste in Poland, meeting the European standards, is now under construction.*

### **Port Service joins the tradition with modern technology of waste utilization.**

#### **Thermic Utilization of Dangerous Waste**

Port Service incinerating plant consists of rotary furnace with afterburning chamber, flue gas cooler and flue gas cleaning system, including: neutralizer, alkali scrubber, dust removing system (with wet electro filter) and coke filter.

Annual capacity of the incinerating plant is about 16,000 Mg of dangerous wastes (9,000 Mg of solid and 6,000 Mg of liquid wastes).

The incinerating plant emission can be monitored "on line" by the supervising environmental protection authority.





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[back](#)



# SARP Industries

## HAZARDOUS WASTE SERVICES

**SARP Industries**  
**Hazardous waste Services**  
**A part of Veolia Environnement group**  
DAUVAIS Aurélie <[ADAUVAIS@sarpindustries.fr](mailto:ADAUVAIS@sarpindustries.fr)>



### ***Innovating to make your waste a sustainable resource***

A pioneer in its industry, SARP Industries combines all the expertise essential for processing and recovering hazardous waste. We guarantee total compliance with safety, environmental and health standards.

By continuously adapting our equipments and developing innovative solutions, we share with our customers and partners the common objective of preserving our environment and producing sustainable development.

SARP Industries treatment and recovery facilities accept all categories of hazardous waste (such as used chemicals, crop protection chemicals and pesticides, medical waste, oils containing PCB, ...) in all its forms (liquid, solid, packed) including the most reactive.

Faced with the wide variation in types of waste, SARP Industries combines the largest treatment and recovery capability in Europe with the ability to operate as a network.

After 40 years of industrial activity in hazardous waste, SARP Industries networks 48 sites in 9 European countries and process 2.2 million tons of hazardous waste each year.

As a leader in Eastern Europe, SARP Industries have the 2 major high temperature incineration lines in Poland – SARPI Dąbrowa Górnicza and Hungary – DOROG.

At the same time, SARP Industries offers complementary services for customized support such as international packaging, conditioning, transport and regulation enforcement for obsolete pesticides with Veolia Field Services (based in UK) or polluted site and soil remediation with GRS Valtech (based in France) ...

Choose SARP Industries, it is your assurance that you are benefiting from first-class services for the preservation of our environment and the guarantee that you are contributing towards making innovation a sustainable resource.

**SARP Industries is an official sponsor of the 12<sup>th</sup> HCH & Pesticides Forum;**

**Meet us on the exhibition area !**

**Communications contact :**

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*Attached photos :*

**photo 1 : SARPI Dabrowa Gornicza plant (Poland)**

The reliable partner for industrial and institutional customers in the area of comprehensive management of hazardous waste



**photo 2 : SARPI Limay (France) – R&D laboratory**

12% of SARP Industries employees work in a laboratory for customer hazardous waste samples analysis or innovative developments



**photo 3 : Veolia Field Services (UK) – obsolete pesticides repackaging**







Jaroslaw Surma, [jaroslaw.surma@remondis.de](mailto:jaroslaw.surma@remondis.de)

SAVA GmbH in Brunsbüttel is a fully owned subsidiary of REMONDIS Industrie Service GmbH & Co. KG. The company has one of the best performing and most modern hazardous waste incineration plant in Europe. Using the state-of-the-art processes available at the plant, the SAVA experts make an important contribution towards ensuring hazardous waste: collection, packaging, transporting and processing in an environmentally friendly way.

SAVA GmbH successfully completed international projects in many countries including Albania, Africa (Mauritania, Senegal, Cape Verde, Togo), Nepal, Romania, Lithuania, Moldova, Ukraine, etc.

Since September 2011 SAVA GmbH implementing project in Belarus financed by the World Bank with the title: "Disposal of POPs obsolete pesticides and related wastes from the Slonim Obsolete Pesticides Landfill". The substances are being recovered from four large cement cellars which had been used as a storage area for hazardous waste. It has been a big challenge for the SAVA Project Management to carry on the removal of the pesticides in the city Slonim – especially during the winter months when the team had to face up the outdoor temperatures up to -35°C and snow 1.5 meters deep.

**We will be happy during 12th International HCH and Pesticides Forum to share experience and challenges which company faced when implementing the project.**

**Welcome to our Presentation and Poster Session!**



## Séché Environnement / Tredi / UTM

Christoph Rittersberger <[c.rittersberger@groupe-seche.com](mailto:c.rittersberger@groupe-seche.com)>

**« PLEASE COME AND VISIT TREDI'S STAND!!!**

Tredi is a worldwide active hazardous waste treatment expert, specialising in obsolete pesticides, PCB, toxic gas, site rehabilitation. We offer our clients to treat their hazardous waste at their site, wherever it is, providing tailor-made turn-key solutions. Or we transport the hazardous waste for treatment at one of our sites in France.

Our technical range starts with packing, conditioning and treating the waste, physically or chemically or biologically. Then follow either final storage at site (including landfill construction) or local valorisation or export to our European Standard hazardous waste incinerators in France.

Tredi has a longstanding experience in this field including major projects for POP with FAO (MENA, Africa), UNEP (Africa, Kazakhstan) and the World Bank (Moldova, Bielorussia). Currently, Tredi participates for example in Ukraine's effort to dispose of obsolete pesticides.

Important features of our work are:

- top-quality service (ISO 9000/14000/18001)
- highest technical standards
- working with trustful local experts and partner companies
- transfer of know-how

Tredi salutes IHPA's work and supports IHPA since a long time. We are proud to be part of IHPA in Kiev 2013!"

[back](#)



### 3. IMPROVING THE SAFETY OF INDUSTRIAL TAILINGS MANAGEMENT FACILITIES IN UKRAINE

Interview with Gerhard Winkelmann-Oei, the project manager of the German Umweltbundesamt (German Environment Agency) that is financing the project **“Improving the safety of industrial tailings management facilities in Ukraine”**, within the Technical Assistance Programme of the German Ministry of the Environment



Mr. Winkelmann-Oei during the kick-off Meeting in Kiev

#### 1. Could you tell me what tailing management facilities are?

Yes, certainly I can do that. First I should then briefly explain what tailings are: Tailings consist of ground rock and process effluents that are generated in mine processing plants. Tailings are the materials left over after the process of separating the valuable fraction from the uneconomic fraction ([gangue](#)) of an [ore](#). Various mechanical and chemical processes are used to extract the desired product from the run of the mine ore.

Respectively tailings may contain trace quantities of metals found in the host ore, and they may contain substantial amounts of added compounds used in the extraction process.

The unrecoverable and uneconomic metals, minerals, chemicals, organics and process water are discharged, normally as slurry, and finally stored in an area commonly known as a Tailings Management Facility (TMF) or Tailings Storage Facility (TSF).

These tailings dumps would continue to leach residual chemicals into the environment, and if weather conditions allowed it the finer fraction would become windborne, blowing around the mining areas.

It is obvious that the physical and chemical characteristics of tailings and their methods of handling and storage are of great and growing concern.

#### 2. That looks a serious issue , but why should Tailing Management Facilities be reported in IHPA POPs Newsletter?

That is a good question. IHPA is working with dangerous chemicals. We are dealing with hazardous activities. The risk potential of an hazardous activity is not only up to the individual danger of the substances used , but also up to the amount of the chemicals, the process conditions and the respective prevention measures being implemented. Also the consequences in a potential accident have to be taken into account. What we noticed is accidents with the largest extent of environmental consequences at global level and often transboundary are up to the failure of TMF

#### 3. Can you mention some of these TMF accidents in the region of Eastern Europe and Former Soviet Union, as you are starting now in Ukraine?

First of all let me mention that these kind of accidents are not only limited to the region of Eastern Europe and Former Soviet Union, but we can see it worldwide wherever mining activities with TSF are performed. But of course the more often mining activities are performed the more you have to be aware of accidents. And in the mentioned region mining activities have a very high economic importance.

Let me just outline some of these accidents so you get a bit of a feeling what we are dealing with. Just recently, in October 2010, there was an environmental disaster in the Hungarian town of Kolontar. Its cause was the dam failure of a TMF with toxic waste of a large factory for the production of aluminum. About 600–700 000 m<sup>3</sup> of red sludge have spilled out.

This so-called 'red mud' was released as a 1–2 m (3–7 ft) wave, flooding several nearby localities. Three villages (Devecser, Kolontár, Somlóvásárhely) were inundated, 10 people died, and more than a hundred people suffered injuries. About 40 square kilometers of land were initially affected. The chemicals extinguished all life in the Marcal river, and reached the Danube River on the 7th October, prompting countries located further down the river to develop emergency plans in response.

The costs of remediation cannot yet be exactly calculated but will be certainly up to millions or even billions of dollars.

In that region another two cases are still fresh in many people's mind was the breaking of dams used for the storage of liquid waste from gold mining in the Romanian cities Baya Mare and Baya Borsa about 10 years ago. Severe environmental damage was caused to the tributaries of the Danube and was even noticed at the Danube River Delta. This is also underlined through an analysis carried out by the International Commission for the Protection of the Danube River (ICPDR), which shows the greatest potential risks in the Danube basin in Romania are combined with the large tailings in mining and processing plants.

And let's not forget the Ukrainian TMF case of Kalush, which are well known and the UN-EU mission to the Kalush area described in 2010 (Technical Scoping Mission Kalush Area, Ukraine March 2010, A Joint United Nations – European Commission Environmental Emergency Response Mission) assessed the situation there as "critical", quoting that mining in the Kalush area has left the ground unstable and prone to subsidence, with mine tailings dams at risk of bursting as a result of snowmelt and spring floods. Even recently again it turned out that the dangers still exist for the entering of pollution from the TMF plus the dangers of the waste generation of HCB, one of the chemicals which IHPA so concerned about, will enter the Dniestr and can endanger the drinking water of Moldova and Western Ukraine, so I hope you can see my point of taking the problems TMF extremely serious.

In addition, the problems in Ukraine are not only limited to the Dniester region: there are also giant retention reservoirs in the Dnieper River Basin (Dnipropetrovsk region), and they pose an enormous threat to the entire Black Sea region. An accident in the Ukrainian city Nikolayev in January 2011 illustrated another potential danger of retention reservoirs: Due to a long period of drought, the reservoirs of an aluminium plant (see Kolontar, Hungary) dried out. Strong winds led to the fact that the deposited residues were stirred up which then extensively contaminated the environment and ground water in the vicinity.

#### **4. So, why has your project such an international importance ?**

Based on these findings the United Nations Economic Commission For Europe (UNECE) had already started a joint activity between the "Industrial Accident"- and "Water"-Convention to develop tools for improving the safety of TMF as they resulted as key problems for environmental safety in the whole UNECE region. Supported and guided by our agency, the Umweltbundesamt, this activity resulted in 2008/9 in *safety guidelines and good practices for tailings management facilities*. The safety guidelines were agreed by all UNECE countries and include both recommendations to UNECE countries and authorities on the necessary legal basis for issuing permits for the safe operation of tailings management facilities as well as recommendations to operator on the safe design of tailings management facilities. UNECE called on the governments of UNECE countries and on TMF operators to include the safety guidelines in the national regulations and technical standards and to apply them.

As an additional tool to support the implementation of the Guidelines in the UNECE member countries: a user-friendly checklist combined with a catalogue of measures is to facilitate the implementation of the UNECE safety guidelines.

Therefore the project, which is part of the UNECE work programme, delivers the key for many countries with TMF problems

Even better is that we have already now arranged the cooperation between this UNECE project and the presently running EU-funded Programme for the Prevention, Preparedness and Response to Man-made and Natural Disasters in the ENPI East Region (PPRD East).

The practical training for testing the checklists will be accessible not only for Ukrainian specialists but also for experts from a number of countries in the UNECE region.

It is obvious that far beyond this region, globally an enormous need to deal with the issue is proven.

In this way we will work out this package and make it available to all those who will need it. It will be like an oil spot spreading on the water.

**5. What do you think the project can achieve in the Region of the Former Soviet Union, where IHPA also has put its focus ??**

As mentioned already the idea is to support these countries in establishing a high safety level at TMF. TMF are economically very important in the region of the Former Soviet Union.

Many of these TMF that are badly maintained, due to former and/or present lack funds and where the dangers are silently increasing, often without their owners are realizing the enormous extent of their own problem, but also lacking the insight of the enormous dangers and consequences for disaster for their near and far surroundings.

As we are paving the way by training activities to raise the safety by prevention measures and being prepared of minimizing consequences in the case of an accident, this project is more welcome in these countries with economies in transition as in any other region!

[back](#)

## PROJECT INFORMATION

# Improving the safety of tailings management facilities based on the example of Ukrainian facilities



Ore processing tailings management facilities (Photo: Grigory Shmatkov)

### Background

The failure of tailings management facilities is a major problem worldwide that regularly leads to severe disasters. To address this problem, the United Nations Economic Commission for Europe (UNECE) developed in 2009 "Safety Guidelines and Good Practices for Tailings Management Facilities". These comprise recommendations to authorities on the necessary legal basis for issuing permits for the safe operation of tailings management facilities as well as recommendations to operators on their safe design. The UNECE called on the governments of UNECE countries to incorporate the safety guidelines into their national regulations and technical standards and to apply them. In subsequent years it became apparent, however, that the implementation of the safety guidelines poses problems because they set out safety standards only in general terms.

### Project

The aim of the project is to overcome the problems in the implementation of the UNECE Safety Guidelines for tailings management facilities and to thus permanently reduce the risk posed by these facilities. The practicality of the project outcomes will be tested at two Ukrainian facilities.

Following a fundamental analysis of the legal framework with respect to tailings management facilities in Ukraine, a checklist will be developed which can be used by inspectors and operators of tailings management facilities to identify safety shortcomings of these facilities and to derive short-, medium- and long-term measures to address those deficiencies. The checklist shall be developed in consultation with the current international expertise in this area and be based in particular on a catalogue of measures prepared on the basis of international standards.

The practicality of this checklist will be tested in cooperation with inspectors and operators by applying it to two selected Ukrainian facilities. After completion of the practical test, the checklist is intended to be available for use in the entire UNECE region.

- Target country/region: Ukraine, transnational
- Duration: 07/2013 – 06/2015
- Beneficiary: Authorities and plant operators
- Implementing organisation: IHPA, International HCH & Pesticides Association, Denmark
- Project number: 26206



## 5. ALTERNATIVE METHOD FOR THE CHEMICAL TREATMENT OF METHYL BROMIDE

Wolfgang A. Schimpf<sup>1</sup>

The Ministry of Environment of the Government of Nepal (MoEST) and the Chemical Safety Project of the “*Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)*”, Germany, planned and carried out a disposal operation in Nepal in October 2011. All 75 tons of obsolete pesticides mentioned in the National Implementation Plan (NIP)<sup>2</sup> of the Government of Nepal from April 2007 were collected and shipped to Germany for final disposal.

The NIP also comprised 43 steel cylinders with 4 tons of methyl bromide, which had been stored for over 30 years in two stores in the Kathmandu Valley. Due to the bad storage conditions two of the steel cylinders corroded and the highly toxic gas escaped into the environment in an uncontrolled manner. Corrosion was also visible on the metal surface of all steel cylinders and the valves were no longer functional.



Photo 1: The steel cylinders with methyl bromide Photo: W. Schimpf

According to the international ADR/RID and IMDG standards for the transportation of steel cylinders with compressed toxic gases, these

cylinders were no longer fit for transportation by road, rail or sea to Europe. Due to these circumstances the GIZ project worked out a technically and economically viable alternative for on-site elimination of the methyl bromide through a chemical treatment process.

### **Methyl bromide**

Methyl bromide, also known as bromomethane, with formula  $\text{CH}_3\text{Br}$  is an odourless, colourless and non-flammable gas produced both industrially and particularly biologically. Methyl bromide has been used as a soil fumigant and structural fumigant to control pests across a wide range of agricultural sectors to control pests and applied as a gas fumigant against insects, termites, rodents, weeds, nematodes, and soil-borne diseases.

In 1999, an estimated 71,500 tonnes of synthetic methyl bromide were used annually worldwide (UNEP, 1 August 1999). 97% of this estimate was used extensively for fumigation purposes in the agriculture field, whilst 3% is used for the manufacture of other products, e.g. as methylation agent, solvent and in fire extinguishers (halons).

Methyl bromide is an extremely toxic vapour. In humans, methyl bromide is readily absorbed through the lungs. Most problems occur as a result of inhalation and exposure effects from skin and eye irritation to death. Most fatalities and injuries occurred when methyl bromide was used as a fumigant.

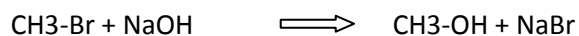
Methyl bromide is recognized ozone-depleting chemical. As such, it is subject to phase-out requirements of the *Montreal Protocol on Ozone Depleting Substances* (1987).

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<sup>1</sup> Author: **Wolfgang A. Schimpf**; M.Sc. in Analytical Chemistry and former Project Manager of the Convention Project Chemical Safety of the “*Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)* GmbH; 65726 Eschborn, Germany; Email contact: [w-schimpf@t-online.de](mailto:w-schimpf@t-online.de)

## Hydrolysis of methyl bromide

The hydrolysis of methyl bromide is a simple chemical reaction that transforms the toxic methyl bromide into non-toxic and bio-degradable methyl alcohol and sodium bromide – which can both be released without any risk into the environment.



Experts from GIZ and a specialist company designed an apparatus for the chemical treatment of the methyl bromide and adopted a proven technology to open the steel cylinders on-site without using the valve. The chemical apparatus was designed as a mobile unit based in a 20-ft sea container. It was shipped to Nepal.

## Transfer of the methyl bromide into the reactors and the chemical process

The chemical process is a two-stage process in a closed system of specially designed steel vessels with a volume of 1,000 litres each. The high-pressure reactor system consists of two steel reactor vessels, with electric stirrers and a flow-control system so that the hydrolysis takes place under controlled conditions.

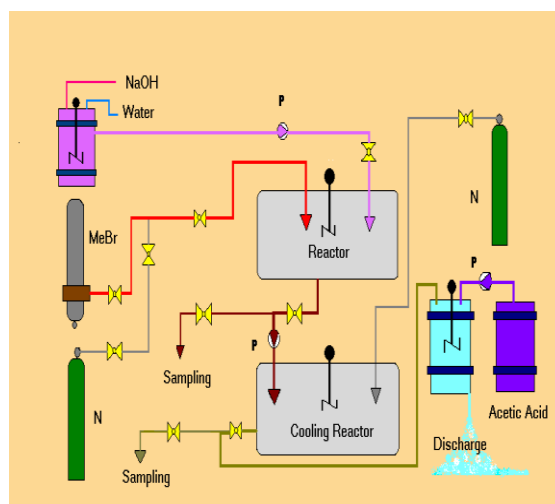
Considering the fact that the original valves could malfunction and to avoid the risk that the methyl bromide might escape into the atmosphere, the steel cylinders were opened on the side wall by applying a special spot drilling technique with an 'gas-tight system'. After drilling, the methyl bromide in the cylinder was transferred into the first reactor vessel via a connected Teflon tube, forced by the gas pressure in the cylinder, supported by nitrogen.

## The reaction process

A volume of 500 litres of a 25% aqueous sodium hydroxide solution was pumped into reactor 1 prior to the hydrolysis in this reactor. After that the methyl bromide from a steel cylinder was transferred into reactor 1 via the Teflon tube. Simultaneously the electric agitator stirred the mixture to support the hydrolysis process.

The dosage of the methyl bromide was controlled, so that the pressure inside reactor 1 did not exceed a pressure of 1.5 bar. The reaction temperature did not rise over 70 °C. After completion of the chemical process the reaction products were pumped into reactor vessel 2 for the after-reaction process and cooling down.

The chemical reaction was controlled by the pressure and the temperature and was monitored through the inspection window.



Graphic: Diagram of the apparatus for treatment of the methyl bromide. Graph: W. Woywod

This is an exothermic reaction and cooling was necessary. After cooling down and the transformation of the methyl bromide into methyl alcohol and sodium bromide, the reaction product was neutralised with acetic acid. When the methyl bromide concentration reached a level lower than 10 mg/l and a pH of 6-7, the reaction products were transported by a tank truck directly to a local sewage system for discharge.



Photo 2: The apparatus for the elimination of the methyl bromide. Photo: W. Schimpf

### Scientific and technical background information

The hydrolysis of methyl bromide is a batch-by-batch process, executed in a closed system. The reaction is very selective and fast; no other by-products are produced. The stoichiometric composition has to be calculated in a way that the quantity of the sodium hydroxide with a 10% excess corresponds exactly to the quantity of 200 kg of methyl bromide – or the quantity of 2 steel cylinders. Continuous chemical analyses were carried out at the end of each batch in order to control the completion of the chemical reaction.

### Summary

The reaction products are eminently water-soluble and have no eco-toxic effects. Methanol is 100% biodegradable (eco-toxicity LC50 fish 96h 10.8 g/l). Sodium bromide has no impact on water. It is an integral part of seawater (toxicity LD<sub>50</sub> rat 3.5 g/kg, oral). After the neutralisation of the aqueous mixture of methanol and sodium bromide the solution was directly disposed of in the local sewage plant.

The emptied steel cylinders were free of methyl bromide residues. After testing with Draeger test tubes, the valves of the steel cylinders were torn off. The steel cylinders were then ready for recycling by one of the local steel plants as scrapped metal.

The practical work on site was carried out by specialists from a German company and by GIZ experts, and supported by Nepalese counterparts.

This method is an economical, technically proven and practical on-site approach for the environmentally sound elimination of the highly toxic gas methyl bromide and can be applied in any country with identical problems to those in Nepal.

### Reference

*National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs) of the Ministry of Environment, Science and Technology (MoEST) of the Government of Nepal; April 2007*

*Towards Methyl Bromide Phase Out: A Handbook for National Ozone Units - New Publication - Information Release; UNEP DTIE OzonAction Programme; 1999*

*Toxicological Profile for Bromomethane, Agency for Toxic Substances and Disease Registry, ATSDR; September 1992.*

*International Chemical Safety Card 0109 for Methyl bromide; WHO/IPCS*

*IMDG Code – the International Maritime Code for Dangerous Goods of the International Maritime Organization (IMO) of the United Nations (Maritime Safety Conventions, Geneva 1974*

*ADR / RID - the European Agreement concerning the International Carriage of Dangerous Goods by Road and Rail; Geneva 1968*

[back](#)

## 6. DESTROYING DANGEROUS PESTICIDES IN MOLDOVA

[http://www.nato.int/cps/en/SID-517D969B-2EC1FEE3/natolive/news\\_98881.htm?goback=.gde\\_2476900\\_member\\_221536939](http://www.nato.int/cps/en/SID-517D969B-2EC1FEE3/natolive/news_98881.htm?goback=.gde_2476900_member_221536939)

NATO - North Atlantic Treaty Organisation



28 Feb. 2013

### Destroying dangerous pesticides in Moldova

Twenty years after independence, Moldova is still grappling with the effects of intensive agriculture production under the former Soviet Union. In the 1970s, large quantities of fertilizers, pesticides and dangerous chemicals were used on Moldovan soil to maximise crop yields. Although their use is now prohibited, large quantities of these pesticides are still stored around the country, including over 3000 tonnes in 450 poorly equipped facilities. A NATO-sponsored project is helping to address this lingering problem. *“The objective of our country is to avoid any new stockpiles of pesticides, which are dangerous for the environment and for public health,”* says Anatol Spivacenco, Deputy Minister for Agriculture and the Food Industry.

### Combating the effects of pollutants





Composed of over 50 per cent arable land, Moldova's economy is heavily dependent on agriculture. Pesticides – including now-banned persistent organic pesticides – were used during the Soviet era to increase food production. Dispersed over large distances by air and water, 50 years of extensive use of pesticides and dangerous chemicals has contaminated the soil and ground water. Although Moldova prohibited the use of these pesticides in the 1970s, the long-term effects on the population remain. Over time, the toxic chemicals can accumulate in the tissues of humans and other living organisms. As well as affecting major organs, and the reproductive and immune systems, many of the pesticides and dangerous chemicals are carcinogenic. A three-phase NATO/Partnership Trust Fund project is addressing the threat posed by obsolete pesticides to Moldovan people. It was developed by NATO and the Moldovan Ministry of Defence in cooperation with other international organisations, including the United Nations Environment Programme, the Regional Environment Centre for Central and Eastern Europe, the United Nations Economic Commission for Europe, the United Nations Development Programme and the Organization for Security and Co-operation in Europe. With Belgium and Romania in the lead of the Trust Fund project, Phase I was completed in July 2007 and focused on centralisation of pesticides and chemicals in 19 Regional Central Storages. An analytical lab was set up to provide a comprehensive database on pesticides and dangerous chemicals under Phase II, which was launched and finalised in early 2010, funded by the NATO Science for Peace and Security Programme. Phase III implementation has now started. The project for the destruction of 950 tonnes of the harmful chemicals was recently contracted in February 2013, under a second Trust Fund led by Romania. The NATO Support Agency (NSPA) is responsible for overseeing implementation of the project.

#### **UNSEEN DANGERS POSE LONG-TERM RISKS**

**CLEANING UP AND DESTROYING THE PESTICIDES IS JUST THE BEGINNING FOR MOLDOVA. *"THE PROBLEM STILL EXISTS AND THE BUILDING MATERIAL AND THE RESIDUALS OF THE PESTICIDES KEEP PENETRATING THE VILLAGES,"* SAYS ANDREI ISAC, EXECUTIVE DIRECTOR OF THE REGIONAL ENVIRONMENTAL CENTRE - MOLDOVA.**

**MANY OF THE FACILITIES WHERE THE PESTICIDES WERE STORED HAVE BEEN DESTROYED. BUT EVEN AFTER THEIR DESTRUCTION, THEY PRESENT A RISK. SOME PEOPLE HAVE USED THE WOOD AND OTHER CONSTRUCTION MATERIALS FROM THE WAREHOUSES, NOT REALISING THAT IT IS CONTAMINATED WITH PESTICIDES AND OTHER CHEMICALS. *"THEY USE THE MATERIALS IN THEIR HOUSEHOLDS AND HAVE NO IDEA ABOUT THE DANGERS THEY POSE,"* POINTS OUT ANDREI VACARCIUC, CHAIRMAN OF CIMIŞLIA RAYON COUNCIL.**

**BEYOND THAT THREAT, THE DETERIORATION OF THE WAREHOUSES AND EXPOSURE TO RAIN AND WIND, HAVE ALLOWED SOME OF THE CHEMICALS TO SEEP INTO THE GROUND AND GROUNDWATER.**

**IN ADDITION, SOME OF THE STORAGE FACILITIES, EMPTIED OF THE PESTICIDES, NOW STORE GRAIN. *"EVEN THOUGH THE PESTICIDES FROM 22 WAREHOUSES FROM CIMIŞLIA HAVE ALREADY BEEN LOADED, SHIPPED AND STORED IN A CENTRALISED MANNER, THE WAREHOUSES STILL PRESENT A PERMANENT DANGER TO PUBLIC HEALTH,"* EXPLAINS MR VACARCIUC.**

**THESE PESTICIDES WILL AFFECT MOLDOVA FOR YEARS TO COME BUT OFFICIALS HOPE TO PREVENT SUCH PROBLEMS FROM REOCCURRING IN THE FUTURE.**

[back](#)

## **7. DIOXIN IN COW'S MILK**

*Bala Sugavanam*

In a study conducted by the Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), twenty samples of milk collected from cows contained traces of dioxins. The cows had been brought to the veterinary hospital after they developed gastroenterological problems, as a result of swallowing large amounts of plastic waste. Stray cows in India eat waste food left in the streets and in the process consume plastic waste which gets mixed with waste food. According to a report "The toxication occurs when the plastic is stuck in the lumen of the cow for a long time. Besides bringing down the appetite of the cow, it contaminates the milk it produces as well. We are looking at how dangerous the impact is for the cattle and for people who are dependent on the milk," said TANUVAS Vice-Chancellor R. Prabhakaran. The increase in number of cows swallowing huge amount of plastic is also because people are increasingly discarding their wastes in light garbage bags which are less than 20 micron. Cattle cannot spit, which makes them more vulnerable, said a professor.

At the moment there is no proof that plastic in cows stomach could produce trace of dioxins under biological conditions and could contaminate the milk. (*Source The Hindu, Madras*)

## **8. PESTICIDE TRAGEDY IN INDIA THAT KILLED MORE THAN 20 SCHOOL CHILDREN.**

*Bala Sugavanam*

The IHPA Newsletter issue number 11 of June 2006 reported a news item as to how tin cans used to store endosulfan has been converted into tea cups for use in road side tea shops.

*"According to a newspaper The Hindu, Madras, that some tea shops in South India use pesticide tins for preparing tea in tea shops and the use is increasing. Use of endosulfan as pesticide has created heated debates in several states in India but none expected that it will appear in tea shops for serving hot tea. One should note that endosulfan could become a potential candidate for consideration for inclusion in the Stockholm Convention" (IHPA .POPs Newsletter 11, June 2006).*

Very recently a tragedy has gone beyond anybody's imagination. A school in a village in Bihar India serving free midday meals to poor children used oil from a plastic container used to store toxic OP pesticide monocrotophos. The poisoned food claimed the lives of 23 children of in Chapra, Saran district of Bihar. Over 50 children were rushed to the primary health care centre when they took ill after eating the midday meal. These type of incidents clearly show how vulnerable the poor segment of the society are very similar to places where toxic obsolete pesticides are stored (*Source The Hindu, Chennai and BBC, London*)

[back](#)