POPs and POPs Wastes Management and Technological Considerations Practice in Viet Nam

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International Principles & Tools

Principles and Instruments

- **Agenda 21** (chapter 19) and the Johannesburg Plan of Implementation
- **SAICM** (Strategic Approach to International Chemicals Management) a policy framework to foster the sound management of chemicals
- **Montreal** Protocol on Substances that Deplete the Ozone Layer;
- **Basel** Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal;
- **Rotterdam** Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade;
- **Stockholm** Convention on Persistent Organic Pollutants (12+9 substances);
- **ILO Convention** No. 170 concerning safety in the use of chemicals at work.” (OPS, para. 20);
- **Rio+20** Outcome document “The Future We Want”
Sound management of chemicals

POPws and POPs wastes management is part of sound management of chemicals and hazardous wastes

Main aspects of SMC

- Assessment of chemicals risks
- GHS of chemicals
- Information exchange of toxic chemicals and chemical risks
- Risk reduction
- Capacity for management of chemicals
- Prevent ion of illegal international traffic in toxin and dangerous products

POPs and POPs wastes management is part of sound management of chemicals and hazardous wastes.
Sound management of chemicals

Product Life-Cycle

www.osha.gov/dsg/hazcom/ghs.html

www.nist.gov/mel/msid/dpg/lifecycle.cfm
National Policies

National policies:

- Law on Chemicals Management
- Law on Environmental Protection (2005, revision 2014)
- **NIP for Stockholm Convention** 2006 (updating, 2014)
- NAP to overcome consequences of toxic chemicals to 2015 and orientation to 2020
- National Target Programme on Pollution Management and Environment Improvement
- NAP for Chemicals Cycle Management (2014)

Key actors:

**National:** MONRE, MOD, MARD, MOIT (EVN), MOH, and MOF (Customs Office)
  Local authorities, MPI, MOF, private sectors.

**International:** UNDP, US-G/USAID, the WB, Czech Republic, New Zealand, UNIDO, FAO, and I-NGOs
Main POPs/wastes in Viet Nam

<table>
<thead>
<tr>
<th>Key POPs &amp; wastes</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dioxin- TCDD (Tetra-chloro dibenzo-dioxin)</strong></td>
<td>By-products of herbicides used during the war 1961-1971</td>
</tr>
<tr>
<td><strong>Pesticides, Lindane, DDT</strong></td>
<td>Using in the past for agriculture, treat mosquito &amp; other purposes during the war, illegal importation</td>
</tr>
<tr>
<td><strong>Medical wastes</strong></td>
<td>Hospitals, beauty services, health cares, etc.</td>
</tr>
<tr>
<td><strong>PCB- Polychlorinated biphenyls</strong></td>
<td>Transformers (old generation)</td>
</tr>
<tr>
<td><strong>Mercury</strong></td>
<td>Inventory in 2014</td>
</tr>
<tr>
<td><strong>E-wastes &amp; others</strong></td>
<td>Various sources (IT-equipments)</td>
</tr>
</tbody>
</table>
## Current status

<table>
<thead>
<tr>
<th>POPs/ wastes</th>
<th>Related actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dioxin in Phu Cat: 7,500 m³</td>
<td>Environmentally safe contained</td>
</tr>
<tr>
<td>Dioxin in Da Nang: &gt;100,000 m³</td>
<td>preparation for treatment</td>
</tr>
<tr>
<td>Dioxin in Bien Hoa: &gt;200,000 m³</td>
<td>temporary prevention measures</td>
</tr>
<tr>
<td>Pesticides: &gt;1,000 metric tons, at 1,500 sites</td>
<td>preparation for treatment</td>
</tr>
<tr>
<td>PCB 10,000-20,000 tons contaminated transformer oils, &gt;900 electrical equipment, range 50-1,450 ppm</td>
<td>preparation for treatment</td>
</tr>
<tr>
<td>Mercury</td>
<td>Inventory in 2014</td>
</tr>
<tr>
<td>E-wastes &amp; others</td>
<td>Planning work</td>
</tr>
</tbody>
</table>
Landfill in Phu Cat airbase

- UNDP/GEF/MONRE project
- 7,500 m³ of dioxin contaminated soils contained, 2011/12
2. Technological Considerations
POP Management process

• Destruction is part of overall POPs management process

**Pre-destruction**
Identify, capture, secure storage, and prepare POPs stockpiles & wastes

**Destruction/Disposal**

**Post-destruction**
Manage emission and by-products, and residuals

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**Monitoring & Evaluating**

*(Post-Des) Monitoring*
Shortlist of Technologies

References:

- Technology evaluations provided by the Basel Convention, Stockholm Convention
- GEF-UNDP-MONRE Project Technology Evaluations Report (by Ron McDowall (University of Auckland, New Zealand)

Short-listed by the Project:

- Bio-remediation (various approaches)
- Mechano-chemical Destruction (MCD) – ball mill
- Thermal Desorption Destruction (in pile)
- Copper-mediated Destruction (CMD) preceded by in-vessel Thermal Desorption
Configuration of the System

- Feeding system
- Drying system
- Heating system
- Ball mills
- Dust control system
Testing Unit

Feeding

Dryer Discharge Conveyor

Ball mills x 4

Final Discharge point from pug mill onto discharge conveyor
Conclusion/ recommendations

- The “bare-born” configuration/scale demonstrated the capability of destroying the PCDD/F contaminated soils with dioxin concentrations <30,000 ppt TEQ treated soils well <1,000 ppt TEQ & likely <300ppt TEQ, RE >99%.
- Well planning and pre-processing is needed for high variation in POPs soil concentrations
- Needed real-time screening laboratory or testing for evaluation of untreated and treated soils
- Sites for treatment is considered contaminated, implications for future land-use/ planning
- Utilization and disposition of treated soils from the remediation/destruction remains problematic
Findings/Recommendations

- POPs and POPs wastes management is part of sound management of chemicals and hazardous wastes
- Technical and envir. qualification of POPs disposal technology should be performance-based
- Cost-effectiveness and commercial maturity of the available technologies
- Primary envir. performance requirements: limits/levels in treated soils; POPs destruction efficiency; Unintended release limits
- Safeguard measures are needed to assure implementation & achievement of performance
- Balance: (i) direct maximizing the quantity of POPs eliminated; and (ii) facilitating technology transfer and development of local infrastructure
Indonesia/ Jakarta’s wastes management
Indonesia/ Jakarta’s wastes management
Indonesia/ Jakarta’s wastes management

Contaminated Hotspots in Viet Nam
Thank you!