

Measures to Reduce or Eliminate Releases from Wastes: The “Low POPs Content”, Recycling of PBDEs and Other Concerns

An IPEN Perspective

April 2011

Waste issues of concern to IPEN include:

The lack of any progress on establishing an appropriate and protective “Low POPs Level” for the original 12 POPs – and particularly for Dioxins and Furans. There is an urgent need for a protective and precautionary “Low POPs Level”.

The urgent need to establish “Low POPs” levels for the nine POPs added to the Convention at COP4.

The concerns about the “Low POPs” limits have increased in light of the increasing evidence that landfill is not an acceptable disposal route for POPs. Elevated low POPs levels result in more POPs being disposed to landfill – recent evidence indicates that this is not an environmentally sound management technique for POPs.

The exemption allowing recycling of PBDE undermines the effectiveness and credibility of the convention. Recycling of PBDE should be stopped as soon as possible.

Low POPs

The current “low POPs content” levels provisionally set in the Basel General Technical Guidelines are much too high. Wastes are considered to have “*low POPs content*” if they contain less than 15 parts per billion (ppb) of Dioxin, or less than 50 parts per million (ppm) of other POPs. These concentrations are not protective of human health and the environment.

Since COP4 the Basel OEWG has made no progress towards establishing the concentration levels of the chemicals listed in Annexes A, B and C at which “*they do not exhibit the characteristics of persistent organic pollutants*” in order to define the low POPs content. The current provisional levels do not meet the requirements of the Stockholm Convention text. The continued failure to resolve this important issue not only undermines the intention of the Stockholm Convention and the effectiveness of the BAT-BEP Guidelines but can also encourage the export of hazardous, POPs-contaminated wastes from developed to developing countries to other countries unable to deal with those wastes safely.

History

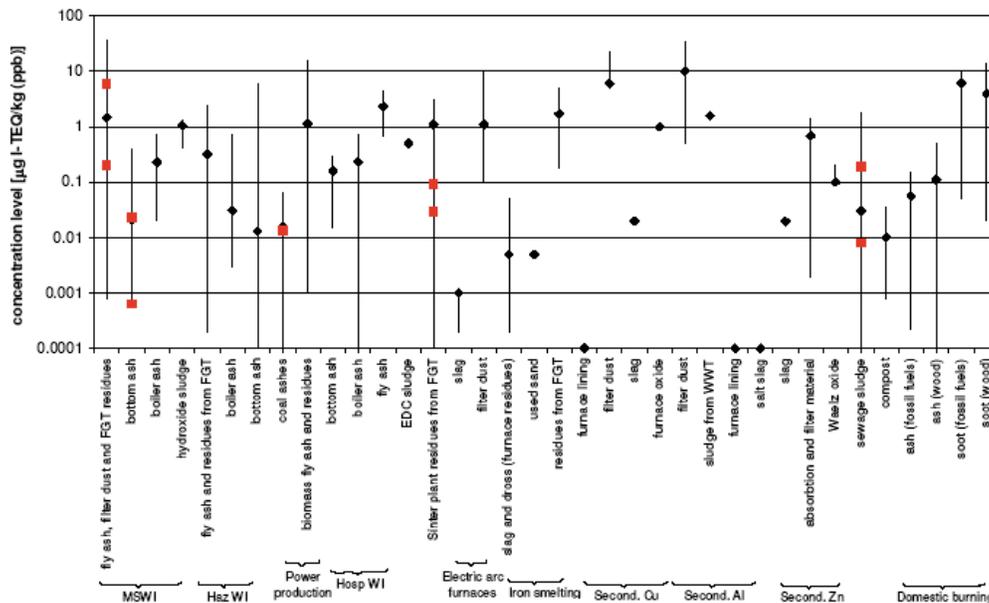
In June 2002, nearly two years before the Stockholm Convention came into force, Consultants [1] acting for the Secretariat of the Basel Convention attempting to establish a “low POPs” limit wrote:

There is a need for setting up some ground rules for establishing a concentration level of POPs to be defined as low levels of POPs by the TWG with regard to the following:

- *acceptable level of lifetime risk;*
- *representative ecological receptors and potential pathways; and*
- *toxicological characteristics/ criteria for acceptability.*

By May 2004 when the Stockholm Convention came into force no progress had been made on this. The Basel working group suggested a provisional “low POPs” level for PCDD/DFs in a range 1-10-50 $\mu\text{g TEQ/kg}$ (ppb) and submitted these to COP7 of the Basel Convention in October 2007 [2]. This was done without prior consultation with the Stockholm Convention in spite of the requirement of the Convention that levels should be determined in “close co-operation” between the Stockholm COP and appropriate bodies of the Basel Convention.

The values proposed had no technical basis. When the levels of dioxin in industrial wastes are plotted it can clearly be seen that none of the values exceed 50 $\mu\text{g/kg}$ (ppb), few exceed 10 $\mu\text{g/kg}$ (ppb) and even 1 $\mu\text{g/kg}$ (ppb) does catch most of the wastes:



The discussion in the Basel working group at the COP was not, in any case, based on the requirement to establish a level at which the wastes “do not exhibit the characteristics of persistent organic pollutants instead”. Instead, as the Earth Negotiations Bulletin [3] confirms “while some participants supported the levels proposed by the OEWG” which was 10 $\mu\text{g/kg TEQ}$ “others supported higher levels on the basis that a lower level would entail high regulatory costs and be difficult to enforce” (our emphasis).

Earth Negotiations Bulletin reported [3] that Greenpeace “stated that the final level represents a setback from the original OEWG proposal, and does not respond to health or environmental

considerations". There is clear evidence that much lower levels of POPs in soils/wastes than those set as provisional "low POPs" content values by Basel OEWG has led to the serious contamination of food even in developed countries, where the control of waste is more strict than in developing countries. Just one example of this would be the 'Byker' incident in Newcastle (UK), where a mixture of incinerator fly ash and bottom ash was used on allotments (community gardens) resulting in high levels of dioxin contamination of eggs, exceeding the EU limits by upto 7 times, in spite of the original wastes being well below the provisional low POPs levels [4].

It is now nearly seven years since COP7 of the Basel Convention adopted the provisional levels and the Basel Open Ended Working Group has continued to control the determination process. Whilst many International standards are more protective than those promoted by the Basel Convention as can be seen on the attached table the Basel working group has made little or no progress in establishing levels which meet the definition of the Stockholm Convention. Nor has any expert group from the Stockholm Convention had an opportunity to take this important work forward. The Annex to this briefing includes examples of regulatory limits for dioxins from around the world – it can be seen that all are below the current provisional "Low POPs" level.

EU and New POPs

In August 2010 the EU adopted Commission regulation 757/2010 [5] which updated the EU POPs regulations [6] with low POPs limits for the POPs added to the Convention by COP4. The values included are:

Tetrabromodiphenyl ether	10mg/kg
Pentabromodiphenyl ether	10mg/kg
Hexabromodiphenyl ether	10mg/kg
Heptabromodiphenyl ether	10mg/kg
PFOS and its derivatives	10mg/kg

Whilst these levels appear more protective than those set previously for the original Stockholm POPs (50 mg/kg apart from PCDD/DF) the levels for PBDEs are actually only marginally lower because the POPs were always supplied in technical mixtures. A more appropriate and protective standard for the POPs apart from the PCDD/DFs would be 10mg/kg total POP concentration.

Landfilling of POPs

An inevitable consequence of the high provisional "Low POPs" level is that more POPs will be landfilled rather than destroyed. There is increasing evidence that landfilling and/or the long-term storage of POPs in, for example, salt mines, cannot be considered to be environmentally sound. Recent relevant literature includes [7-11] and shows that over the medium to long-term leakage of POPs from landfill sites is inevitable – sometimes in more hazardous forms than they were originally landfilled due to the chemistry of the landfill sites.

IPEN position:

COP5 should modify the proposed language in Para 7d of Document 12 to reinforce synergies and ensure that the Stockholm Convention cooperates with the Basel Convention as stated in Article 6. The current language cedes authority for various tasks to Basel instead of promoting synergies and cooperation. Proposed language for paragraph 7d: *Invites the Conference of the Parties to the Basel Convention to consider close cooperation with the Stockholm Convention in undertaking the*

work referred to in paragraphs 1 (a)–(c) of decision POPRC-6/3 by cooperatively convening a joint meeting of its appropriate subsidiary body and the POPs Review Committee of the Stockholm Convention.

The Recycling of PBDEs

Document: UNEP/POPS/COP.5/15

IPEN supports the recommendations of POPRC in relation to ending the recycling exemption for PBDEs. IPEN endorses the statement in the Annex to UNEP/POPS/COP.5/15 that:

“The objective is to eliminate brominated diphenyl ethers from the recycling streams as swiftly as possible. To meet this objective, the principal recommendation is to separate articles containing brominated diphenyl ethers as soon as possible before recycling. Failure to do so will inevitably result in wider human and environmental contamination and the dispersal of brominated diphenyl ethers into matrices from which recovery is not technically or economically feasible and in the loss of the long-term credibility of recycling”.

IPEN Position:

The COP is therefore strongly recommended to endorse Decision POPRC-6/2 on the elimination of bromodiphenyl ethers from the waste stream and to welcome the associated actions as set out in the Annex to UNEP/POPS/COP.5/15 including requesting special consideration by developed country Parties to implement these recommendations, and to request the Secretariat to update COP6 on efforts to eliminate brominated diphenyl ethers from the recycling streams as swiftly as possible.

COP5 should request developed country Parties and other Parties practicing recycling of materials containing brominated diphenyl ethers to:

- Notify the Secretariat of their intent to use this exemption in accordance with Decision SC-4/14
- Immediately stop the export of these materials except for the purpose of environmentally sound disposal
- Rapidly implement effective screening and separation techniques to separate materials containing the substances before recycling proceeds
- Minimize occupational exposure and assess occupational exposures of staff working in facilities where articles and wastes potentially containing brominated diphenyl ethers are stored, sorted, treated, recycled, recovered or disposed
- Promote and facilitate public awareness-raising on the potential harm of materials containing polybrominated diphenyl ethers currently in use
- Generate and collect information on releases of brominated diphenyl ethers and unintentionally produced brominated organic compounds such as polybrominated dibenzodioxins and polybrominated dibenzofurans (PBDD/PBDF) in emissions to air and in the solid residues from thermal processes used in treating materials contaminated with brominated diphenyl ethers
- Report on their efforts to eliminate brominated diphenyl ethers from the recycling streams as swiftly as possible during the interim period between COP5 and COP6

PFOS, its salts, and PFOSF

Document: UNEP/POPS/COP.5/15

The POPRC reviewed the information provided by parties and observers on PFOS, its salts, and PFOSF. The Committee identified potential gaps in the information and developed recommendations on the risk reduction for PFOS, its salts and PFOSF, including on how to fill the information gaps identified.

IPEN Position:

COP5 should welcome the recommendations of the POPRC on risk reduction for PFOS, its salts and PFOSF, request Parties making use of the specific exemptions and acceptable purposes for these substances to notify the Secretariat of their intent, and request the Secretariat to update COP6 on efforts to reduce and eliminate PFOS, its salts, and PFOSF use as swiftly as possible. COP5 should request Parties using PFOS, its salts and PFOSF to:

- Promote development and implementation of best available techniques and best environmental practices destruction technologies for wastes containing PFOS in current production and industrial uses of PFOS as specified in Article 6
- Strictly monitor landfills and treat leachate found to contain these substances according to requirements of Article 6
- Identify and cease using stocks containing PFOS (fire-fighting foams, carpets and others)
- Establish and implement a strategy for identifying and monitoring sites contaminated with PFOS in accordance with Article 6 of the Convention
- Request relevant industries to report to national governments current and historical practices in use, emissions, and managing sludge
- Halt the practice of applying biosolids or sewage sludge contaminated with these substances to agricultural areas or other dispersive practices
- Minimize with the goal of eliminating occupational exposures and assess occupational exposures of staff working in facilities where these substances are stored and used
- Promote and facilitate public awareness-raising on the potential harm of the substances and materials containing them
- Report on their efforts to eliminate PFOS, its salts, and PFOSF use as swiftly as possible during the interim period between COP5 and COP6

Slow Progress in addressing the POPs Stockpiles:

The progress in addressing stockpiles of POPs – particularly in Africa (where the total POPs stockpiles are between about 25,000 and 50,000 tonnes) and Eastern Europe (with total stockpiles estimated at around 250,000 tonnes), has been very slow.

The addition of α -HCH, β -HCH, and lindane (industrial γ -HCH) to the convention will inevitably increase the pressure on the limited resources available. Whilst approximately 1.9 million tonnes of production wastes, mainly α -HCH, have been quantified, it is estimated that between 4 and 7 million tonnes of residues were produced. Most of this waste is untreated and is often found in unsecured locations accessible to children and grazing animals. The countries most likely to be affected are Austria, Brazil, China, Czech Republic, France, Germany, Hungary, India, Italy, Japan, Macedonia, Nigeria, Poland, Romania, Slovakia, South Africa, Spain, Switzerland, Turkey, The Netherlands, UK, USA, and former USSR (Vijgen, 2011).

Significantly more resources will be required if these stockpiles are to be destroyed.

Comparison of International Standards –for emissions, disposal and clean up

SOIL		
ATSDR Interim Policy Guidelines		
≤ 50 ppt	Screening level	ATSDR, 1997, 2006
≥ 50 ppt	Evaluation level – proposed ≥ 50 ppt in draft update	ATSDR, 1997, 2006
≤ 1,000 ppt		
≥ 1,000 ppt	Action level – proposed for deletion in draft update	ATSDR, 1997, 2006
Canadian Environmental Quality Guidelines		
4 ppt	Alert level	CCME, 2005a
New Zealand Interim Acceptance Criteria		
10 ppt	Agricultural	MoE, 1997
1,500 ppt	Residential	MoE, 1997
18,000 ppt	Industrial	MoE, 1997
90,000 ppt	Industrial – Paved, with Management Plan	MoE, 1997
21 ppt	Maintenance	MoE, 1997
EU Waste Incineration Directive		
0.3 ppt	release to water from waste incinerators	EU, 2000
Germany Federal and Lander Ministers of the Environment recommendations		
5-40 ppt	Agriculture	EU, 1999
100 ppt	Playgrounds	EU, 1999
1,000 ppt	Residential areas	EU, 1999
10,000 ppt	Industrial areas	EU, 1999
The Netherlands Guidelines		
1,000 ppt	Residential and agricultural areas	EU, 1999
10 ppt	Dairy farming	EU, 1999
10 ppt	Land with sensitive use	EU, 1999
250 ppt	Land with less sensitive use and groundwater extraction	EU, 1999
250 ppt	Land with less sensitive use	EU, 1999
Finland Ministry of the Environment, Department for Environmental Protection		
2 ppt	Proposed guideline	EU, 1999
500 ppt	Proposed limit value (agricultural and residential) for contaminated soil	EU, 1999
Hawaii Proposed dioxin action levels for East Kapolei Brownfield Site		
<42 ppt	Low risk, no further action required	DHH, 2006
>42 <390 ppt	Intermediate risk, further action	DHH, 2006
>390 ppt	High risk, Residential use not recommended in absence of remedial actions to reduce potential exposure.	DHH, 2006
US EPA Region 5 ecological screening levels		
11 ppt	PCDD soil guideline level	USEPA, 2003
38.6 ppt	PCDF soil guideline level	USEPA, 2003
US EPA Region 6 screening level for 2,3,7,8-TCDD		
39 ppt	Residential soil	USEPA, 2001
US EPA Region 9 preliminary remediation goal for 2,3,7,8-TCDD		
39 ppt	Residential soil	USEPA, 2000
Japan		
3ppb	Limit for solid wastes to landfill	Japan, 1971
10 pg-TEQ/l	Leaching limit	Japan XX
Czech Republic		
1 ppt	Background	BIPRO, 2006
100 ppt	Pollution limit	BIPRO, 2006
500 ppt	Action limit - living area	BIPRO, 2006
1 ppb	Action limit – recreational	BIPRO, 2006
10 ppb	Action limit – industrial	BIPRO, 2006
Denmark		
<5 ppt	Target concentration soil used for agricultural purposes	BIPRO, 2006
5 – 40 ppt	Control of products for dioxin transfer	BIPRO, 2006
>40 ppt	Restrictions on crops with minimum dioxin transfer	BIPRO, 2006
> 100 ppt	Soil exchange on children's playgrounds	BIPRO, 2006
> 1 ppb	Soil exchange in residential areas	BIPRO, 2006
> 10 ppb	Soil exchange independent of the location	BIPRO, 2006
Korea		
3 ppb	Low POPs level for solid wastes set in the Persistent Organic Pollutant Special Management Law	Jin, 2009
100 ppt	Low POPs level for liquid wastes set in the Persistent Organic Pollutant Special Management Law	Jin, 2009

Full citations can be obtained from IPEN

EndNotes:

1. SENES Consultants Limited, *Draft Technical Guidelines for Environmentally Sound Management of Persistent Organic Pollutants Wastes June 2002*. 2002, Prepared for the Secretariat of the Basel Convention United Nations Office at Geneva: Ontario Canada.
2. Basel Convention, *UNEP/CHW.7/8/Add.1 Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal Seventh meeting Geneva, 25–29 October 2004 Item 6 of the provisional agenda* Report on the implementation of the decisions adopted by the Conference of the Parties at its sixth meeting "Technical guidelines for environmentally sound management of wastes consisting of, containing or contaminated with polychlorinated biphenyls, polychlorinated terphenyls or polybrominated biphenyls August 2004*. 2004: Geneva.
3. iisd, *Reports on the Seventh meeting of the Conference of the Parties (COP-7) to the Basel Convention 25-29 October 2004* <<http://www.iisd.ca/basel/cop7/>>, in *Earth Negotiations Bulletin*. 2004.
4. Pless-Mulloli, T., et al., *Report on the analysis of PCDD/F and heavy metals in soil and egg samples from Newcastle allotments: Assessment of the role of ash from Byker incinerator*. . 2001, University of Newcastle.
5. European Commission, *Commission Regulation (EU) No 757/2010 of 24 August 2010 amending Regulation (EC) No 850/2004 of the European Parliament and of the Council on persistent organic pollutants as regards Annexes I and III Text with EEA relevance*. Official Journal of the European Union, 2010. **OJ L 223**: p. 29–36.
6. European Commission, *Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC NOTE: Whilst this was published in the Official Journal of the European Union L158 of 30th April 2004. A Corrigendum to the Regulation was subsequently published in the Official Journal L229/5 of 29th June 2004*. 2004, Official Journal of the European Union L 229/5.
7. Weinberg, I., A. Dreyer, and R. Ebinghaus, *Landfills as sources of polyfluorinated compounds, polybrominated diphenyl ethers and musk fragrances to ambient air*. *Atmospheric Environment*, 2011. **45**(4): p. 935-941.
8. Weber, R., et al., *Review Article: Persistent organic pollutants and landfills - a review of past experiences and future challenges*. *Waste Management & Research*, 2011. **29**(1): p. 107-121.
9. Oliaei, F., R. Weber, and A. Watson, *PBDE contamination in Minnesota Landfills, waste water treatment plants and sediments as PBDE sources and reservoirs* *Organohalogen Compounds* 2010. **72**.
10. Busch, J., et al., *Polyfluoroalkyl compounds in landfill leachates*. *Environmental Pollution*, 2010. **158**(5): p. 1467-1471.
11. Schmid, P., et al., *Polychlorierte Biphenyle (PCB) in Gewässern der Schweiz - Daten zur Belastung von Fischen und Gewässern mit PCB und Dioxinen, Situationsbeurteilung (in German)*. 2010, Bundesamt für Umwelt BAFU: Bern.