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**Stockholm Convention on Persistent Organic Pollutants**
**Persistent Organic Pollutants Review Committee**
**First meeting**
Geneva, 7–11 November 2005
Item 6 of the provisional agenda*

**Consideration of chemicals newly proposed for inclusion in Annexes A, B or C of the Convention**

# Verification of whether new proposals contain the information specified in Annex D of the Convention

## Note by the Secretariat

1. Paragraph 2 of Article 8 of the Stockholm Convention on Persistent Organic Pollutants reads as follows:

> "The Secretariat shall verify whether the proposal contains the information specified in Annex D. If the Secretariat is satisfied that the proposal contains the information so specified it shall forward the proposal to the Persistent Organic Pollutants Review Committee."

2. The process by which the Secretariat makes the verification of whether a proposal contains the information specified in Annex D of the Convention is described in document UNEP/POPS/POPRC.1/INF/4. It is important to keep in mind that the verification process is not an evaluation of the rigour or strength of the scientific information provided.

3. Pursuant to the above, the Secretariat has examined five new proposals which were submitted before 1 August 2006. The proposals are for octabromodiphenyl ether (documents UNEP/POPS/POPRC.2/INF/4 and UNEP/POPS/POPRC.2/12), pentachlorobenzene (documents UNEP/POPS/POPRC.2/INF/5 and UNEP/POPS/POPRC.2/13), short-chained chlorinated paraffins (documents UNEP/POPS/POPRC.2/INF/6 and UNEP/POPS/POPRC.2/14) alpha hexachlorocyclohexane (documents UNEP/POPS/POPRC.2/INF/7 and UNEP/POPS/POPRC.2/15) and beta hexachlorocyclohexane (documents UNEP/POPS/POPRC.2/INF/8 and UNEP/POPS/POPRC.2/16).

4. The Secretariat assembled for each proposal a verification dossier containing a conclusion as to whether the proposal provided the information specified in Annex D. Those dossiers are reproduced in the annex to the present note and have not been formally edited.

* UNEP/POPS/POPRC.2/1.

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# Annex

## Secretariat verification of specified data – dossiers

## Contents

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# I. Octabromodiphenyl ether (commercial mixture) proposal (European Union)

| | | |
|---|---|---|
| **1(a). Chemical Identity** | (i) Names, CAS number, etc… | The IUPAC chemical name and CAS Registry number are provided for the commercial mixture. Synonyms are provided for 'commercial' octaBDE. |
| | (ii) Structure, isomers, etc… | The molecular weight, molecular formula and the structural formula are provided for octaBDE (but not for other components). |
| **1(b). Persistence** | (i) Evidence of half-life greater than… **or** | Persistence reported as 'no degradation seen over 28 days' in biotic assays; however, no other measurement data are provided. |
| | (ii) Evidence it is otherwise sufficiently persistent… | The proposal indicates 'little significant biotic or abiotic degradation of octaBDE' based on an evaluation of other BDEs; however, no data are provided. |
| **1(c). Bioaccumulation** | (i) Evidence of BCF/BAF greater than… **or** | The BCF for octaBDE is low (<9.5) possibly due to its large molecular size. Other BDEs in the commercial mixture have BCFs of >5000. No BAFs are provided. The log $K_{OW}$ values for octaBDE is reported to be >5. |
| | (ii) Evidence of other reasons for concern… **or** | None provided. |
| | (iii) Monitoring data indicating bio-accumulation potential… | Some evidence is provided that BDEs associated with octaBDE bioaccumulate in animal tissues in the Arctic. |
| **1(d). Potential for Long-range Environmental Transport** | (i) Measured levels of concern in distant locations… **or** | Monitoring data indicating that lower and higher brominated congeners (some components of commercial octaBDE) are transported to remote areas and evidence of increasing concentrations of penta- and hexaBDE in sediment and biota in the Arctic. |
| | (ii) Monitoring data showing transfer may have occurred… **or** | Evidence of components of commercial octaBDE attached to particles found in air samples in remote locations (Arctic). |
| | (iii) Environmental fate properties/models demonstrating the potential for transport…. | The vapour pressure for octaBDE is reported to be $6.6 \times 10^{-6}$ Pa.<br>The atmospheric half-life for octaBDE is estimated to be 76 days. |
| **1(e). Adverse Effects** | (i) Evidence of adverse effects… **or** | No direct human evidence or ecosystem evidence provided; however, the EU has classified octaBDE as 'may cause harm to unborn child', and 'possible risk of impaired fertility'. Lower BDEs, found in commercial octaBDE, may be more toxic. |
| | (ii) Toxicity or ecotoxicity data that indicate potential for damage… | Evidence of laboratory animal developmental toxicity (NOEL in mammals: 2 mg/kg-bwt/d). Proposal indicates that other BDEs associated with commercial octaBDE are more toxic. No appreciable effects of commercial octaBDE on aquatic, sediment or soil species in bioassays; however, secondary poisoning may occur (birds eating exposed worms) with the hexaBDE component. |

## 2. Statement of Concern

Statement of the reasons for concern provided as follows:
*"The fact that c-octaBDE consists of several polybrominated diphenyl ethers and congeners makes the assessment of POP characteristics more difficult than in the case of a single compound. However, it can be concluded that c-octaBDE meets the criteria for persistence, potential for long range environmental transport and potential to cause adverse effects. The situation with regards to the screening criteria for bioaccumulation is not so clear cut but the commercial product does contain at least a component group that has been confirmed by the POPRC to meet all the screening criteria (pentabromodiphenyl ether). It also contains hexabromodiphenyl ether (hexaBDE), another congener with POPs characteristics.*

*A second aspect of concern is that although the higher brominated diphenyl ethers are persistent, there is evidence that they can degrade under some conditions. Lower brominated diphenyl ether congeners have been identified among the degradation products. Since some of the products may be more bioaccumulative and toxic than the parent compound, any significant formation would be a cause for concern.*

*An additional risk is the possible formation of brominated dibenzo-p-dioxins and dibenzofurans during combustion and other high temperature processes involving articles treated with c-octaBDE flame retardants.*

*Marketing and use of octaBDE has been prohibited recently in the EU; however, it is assumed that it is still produced and used as a flame retardant in many countries. As octaBDE and its congeners can move far from their sources, single countries or groups of countries alone cannot abate the pollution caused by it. Due to the harmful POP properties and risks related to its possible continuing production and use, international action is warranted to eliminate this pollution".*

**3. Additional Information**


- European Commission, 2003: European Union Risk Assessment Report: Diphenyl ether, octabromo derivative (CAS No: 32536-52-0, EINECS No: 251-087-9). Risk assessment. Office for Official Publications of the European Communities, 2003. (http://ecb.jrc.it/existing-chemicals/); and
- European Commission, 2005: Risk profile and summary report for octaBDE (http://www.unece.org/env/popsxg/docs/2005/EU%20octaBDE.pdf).
- Environmental Health Criteria (EHC) 162: Brominated Diphenyl Ethers. IPCS, 1994
- Brominated Flame Retardants. Report 5065 (author, C.A. de Wit), Swedish Environmental Protection Agency, 2000.


**Secretariat Evaluation:**

The proposal identifies the chemical as required under Annex D 1 (a) and provides information on the chemical relating to the screening criteria set out in Annex D 1 (b-e). Few data are given in the proposal itself relating to the criteria (e.g. persistence). It includes a statement of the reasons for concern and the need for global control. Additional information, in the form of a review paper developed for the proposal, has been provided. The Secretariat is satisfied that the proposal, when combined with the additional information references, contains the information specified in Annex D.

# II. Pentachlorobenzene proposal(European Union)

| | | |
|---|---|---|
| **1(a). Chemical Identity** | (i) Names, CAS number, etc… | The IUPAC chemical name, CAS Registry number and EINECS number are provided. Synonyms are provided. |
| | (ii) Structure, isomers, etc… | The molecular weight, molecular formula and the structural formula are provided. |
| **1(b). Persistence** | (i) Evidence of half-life greater than… **or** | The half life of PeCB ranges from 6.5-42 months in surface water and 26-46 months in deep water. In soil, the half life is 6.5-11.5 months. |
| | (ii) Evidence it is otherwise sufficiently persistent… | Not required. |
| **1(c). Bioaccumulation** | (i) Evidence of BCF/BAF greater than… **or** | The measured BCF values based on whole body wet weight vary between 3 400 and 13 000. The geometric mean BCF for fish is reported to be 5300. Log $K_{ow}$ values for PeCB vary between 4.8 and 5.18 |
| | (ii) Evidence of other reasons for concern… **or** | None provided. |
| | (iii) Monitoring data indicating bio-accumulation potential… | PeCB has been found throughout the Arctic at increasing concentrations in the food chain. |
| **1(d). Potential for Long-range Environmental Transport** | (i) Measured levels of concern in distant locations… **or** | Monitoring data indicating that PeCB can be found in remote locations in the Arctic in sediment and biota at multiple trophic levels. |
| | (ii) Monitoring data showing transfer may have occurred… **or** | PeCB has been found in all environmental compartments in remote locations (Arctic). |
| | (iii) Environmental fate properties/models demonstrating the potential for transport…. | The vapour pressure of PeCB is 2.2 Pa. The estimated atmospheric half-life for PeCB is 45-467 days based on modelling data. European modelling indicates that PeCB can travel over 8 000 km. |
| **1(e). Adverse Effects** | (i) Evidence of adverse effects… **or** | No direct human evidence or ecosystem evidence provided. |
| | (ii) Toxicity or ecotoxicity data that indicate potential for damage… | Evidence of laboratory animal developmental toxicity (NOEL approximately 100 mg/kg-bwt/d) and liver and kidney damage (NOEL at 12.5 mg/kg-bwt/d). A NOEL in male rats (outcome unspecified) is reported to be 33 mg/kg-bwt/d. The lowest $LC_{50}$ value for fresh water organisms (fish) is 250 µg/L. The lowest NOEC reported is 10 µg/L (crustaceans). |

**2. Statement of Concern**

Statement of the reasons for concern provided as follows:
*"PeCB is persistent in soil, water and the atmosphere. It has been shown to bioconcentrate in different species and to be toxic to aquatic organisms. It is also widely found in humans and biota in the environment as a result of its long range transport.*

*Although its production seems to have ceased in Europe and North America, it is still present as an impurity in commercial pesticides which are still used, and it is unclear whether it may be used as a pesticide or flame retardant in other parts of the world. As PeCB can move in the atmosphere far from its sources, single countries or groups of countries alone cannot abate the pollution caused by it. Due to its harmful POP properties and risks related to its possible continuing production, use and releases to the environment, international action is warranted to control this pollution."*

**3. Additional Information**

- Van de Plassche, E.J., Schwegler, A.M.G.R., Rasenberg, M. and Schouten, A. 2002. Pentachlorobenzene. Dossier prepared for the third meeting of the UN-ECE Ad hoc Expert Group on POPs. Royal Haskoning report L0002.A0/R0010/EVDP/TL
(http://www.unece.org/env/popsxg/docs/2005/EU%20pentachloorbenzeen.pdf); and

- Belfroid, A., van der Aa, E. and Balk, F. 2005. Addendum to the risk profile of Pentachlorobenzene. Royal Haskoning report 9R5744.01/R0005/ABE/CKV/Nijm.
(http://www.unece.org/env/popsxg/docs/2005/PeCB%20_def__NL.pdf ).

**Secretariat Evaluation:**

The proposal identifies the chemical as required under Annex D 1 (a) and provides information on the chemical relating to the screening criteria set out in Annex D 1 (b-e). It includes a statement of the reasons for concern and the need for global control. The Secretariat is satisfied that the proposal, when combined with the additional information references, contains the information specified in Annex D.

# III. Short-chain chlorinated paraffins proposal (European Union)

| | | |
|---|---|---|
| **1(a). Chemical Identity** | (i) Names, CAS number, etc… | The IUPAC chemical name, CAS Registry number and EINECS number are provided. Synonyms are provided. |
| | (ii) Structure, isomers, etc… | The molecular weight range for 10 to 13 carbon alkanes and the generic molecular formula are provided. The structural formulae for two example SCCPs are provided. |
| **1(b). Persistence** | (i) Evidence of half-life greater than… **or** | Simulation tests indicate that SCCPs with low chlorine content (e.g. <50% wt chlorine) may biodegrade slowly in the environment in the presence of adapted microorganisms. The half-life of SCCPs in sediment is reported to be greater than 1 year (no data provided in the proposal). |
| | (ii) Evidence it is otherwise sufficiently persistent… | An EU scientific committee came to the conclusion that SCCPs are potentially persistent (P) and possibly very persistent (vP). |
| **1(c). Bioaccumulation** | (i) Evidence of BCF/BAF greater than… **or** | Experimentally derived whole body BCFs in fish range between 1173-7816 (based on radioactivity measurements) and 574-7273 (based on the parent compound analysis). *In situ* measurements of Lake Trout yield a BCF for C10-13 SCCPs of 36500. The log $K_{ow}$ of different SCCPs range from 4.39 to 8.69. |
| | (ii) Evidence of other reasons for concern… **or** | None provided. |
| | (iii) Monitoring data indicating bio-accumulation potential… | Some evidence is provided that BDEs associated with octaBDE, bioaccumulate in animal tissues in the Arctic. |
| **1(d). Potential for Long-range Environmental Transport** | (i) Measured levels of concern in distant locations… **or** | Monitoring data indicate that SCCPs are present in marine mammals and in Inuit mother's milk in the Arctic region. |
| | (ii) Monitoring data showing transfer may have occurred… **or** | SCCPs have been reported in Arctic air and sediments. |
| | (iii) Environmental fate properties/models demonstrating the potential for transport…. | The EU assumes a vapour pressure of $2.1 \times 10^{-2}$ Pa at 40°C for a SCCP with chlorine content of approximately 50% (range in the proposal is $2.8 \times 10^{-7}$ to 2.5 Pa). Atmospheric half-lives >2 days (1.9-7.2 days) have been estimated for SCCPs. |
| **1(e). Adverse Effects** | (i) Evidence of adverse effects… **or** | No direct human evidence or ecosystem evidence provided; however, the IARC has classified SCCPs as 'possible human carcinogens' (dose-related increases in the incidence of adenomas and carcinomas in rodent liver, thyroid and kidney). |
| | (ii) Toxicity or ecotoxicity data that indicate potential for damage… | SCCPs are of low acute toxicity to fish but high chronic toxicity (NOECs are <0.040 and 0.28 mg/L for rainbow trout and sheepshead minnow respectively). The NOECs for aquatic invertebrates are even lower (0.012 to 3.7 mg/L). SCCPs are not highly toxic to mammals (NOAELs of 100 and 1000 mg/kg-bwt/day in rats and mice respectively). |

**2. Statement of Concern**

Statement of the reasons for concern provided as follows:

*"SCCPs are highly toxic to aquatic organisms and it is considered as a possible carcinogen. SCCPs do not break down naturally and tend to accumulate to biota. The available data from remote areas clearly show contamination of the environment and biota by SCCPs. Their persistence, bioaccumulation and toxicity mean that they may have damaging environmental effects at a global level. Overall, it can be considered that SCCPs meet the screening criteria for persistence, potential to cause adverse effects, bioaccumulation and potential for long range environmental transport.*

*Placing on the market and use of SCCPs have been restricted over the last years in the European Union but no total prohibition has yet been foreseen. On the other hand, production and use of SCCPs continues unrestricted in many other countries. As SCCPs can move in the atmosphere far from its sources, single countries or groups of countries alone cannot abate the pollution caused by it. Due to the harmful POP properties and risks related to its widespread production and use, international action is warranted to control this pollution."*

**3. Additional Information**


- European Commission (2000). European Union Risk Assessment Report, Vol. 4: alkanes, $C_{10–13}$, chloro-. European Chemicals Bureau, Brussels, Belgium. 166 pp. (EUR 19010; ISBN 92-828-8451-1). http://ecb.jrc.it/existing-chemicals/

- European Commission (2005). Final Draft. Updated Risk Assessment of alkanes, $C_{10–13}$, chloro-. Combined draft of August 2005. http://ecb.jrc.it/existing-chemicals/.

- Filyk, G, Lander, L, Eggleton, M, Muir, D, Puckett, K. (2003) Short Chain Chlorinated. Paraffins (SCCP) Substance-Final Draft II. Environment Canada. Dossier prepared for UNECE *ad hoc* Expert Group on POPs. http://www.unece.org/env/popsxg.

- WHO (1996). Chlorinated Paraffins, Environmental Health Criteria Report No 181. World health Organization, Geneva. 181 pp. (ISBN 92-415-7181-0).


**Secretariat Evaluation:**

The proposal identifies the chemical as required under Annex D 1 (a) and provides information on the chemical relating to the screening criteria set out in Annex D 1 (b-e).). It includes a statement of the reasons for concern and the need for global control. The Secretariat is satisfied that the proposal, when combined with the additional information references, contains the information specified in Annex D.

# IV. Alpha-hexachlorocyclohexane proposal (Mexico)

| | | |
|---|---|---|
| **1(a). Chemical Identity** | (i) Names, CAS number, etc… | The IUPAC chemical name and CAS Registry number are provided. A synonym is also provided. |
| | (ii) Structure, isomers, etc… | The molecular weight and molecular formula are provided. The structural formulae for the two alpha enantiomers are provided. |
| **1(b). Persistence** | (i) Evidence of half-life greater than… **or** | Persistence in Arctic Ocean water has been estimated at 6-23 years and in a small Arctic lake at 0.6- 1.4 years. The half lives calculated in soils are less than 6 months. |
| | (ii) Evidence it is otherwise sufficiently persistent… | None provided |
| **1(c). Bioaccumulation** | (i) Evidence of BCF/BAF greater than… **or** | The BCF in aquatic species ranges from 313-2400; however the BCF in microorganisms and invertebrates rages from 60-2750 (dry weight) and 8000-12000 (lipid weight).The log $K_{OW}$ value is reported to be 3.8. |
| | (ii) Evidence of other reasons for concern… **or** | None provided. |
| | (iii) Monitoring data indicating bio-accumulation potential… | Contamination of wildlife and human milk samples from the Arctic with a-HCH indicate bioaccumulation is extensive, although no data are provided in the proposal. |
| **1(d). Potential for Long-range Environmental Transport** | (i) Measured levels of concern in distant locations… **or** | Arctic monitoring data indicate that a-HCH can be found in nearly all wildlife and human tissues. Reports of a-HCH in the tissues of Antarctic species are also cited. |
| | (ii) Monitoring data showing transfer may have occurred… **or** | Air-water partitioning for a-HCH favors the water phase, especially cold water. A-HCH could be moved northwards by air, accumulated in the water and slowly build into a large reservoir in the Arctic Ocean. |
| | (iii) Environmental fate properties/models demonstrating the potential for transport…. | The vapor pressure is reported to be $4.5 \times 10^{-5}$ mm Hg at 25 C.<br>The atmospheric half-life has been estimated at 0.3-4 years depending on the atmospheric hydroxyl radical concentration. |
| **1(e). Adverse Effects** | (i) Evidence of adverse effects… **or** | No direct human evidence or ecosystem evidence provided; however, the IARC has classified a-HCH as 'possibly carcinogenic to humans' based on rodent studies. |
| | (ii) Toxicity or ecotoxicity data that indicate potential for damage… | Evidence of laboratory animal carcinogenicity (rats and mice), liver and kidney effects and capacity to cause endocrine disruption. |

**2. Statement of Concern**

Statement of the reasons for concern provided as follows:
*"Alpha-HCH is the most frequent isomer found in environmental compartments. Due to its physicochemical properties it has the potential to be transported long distances and it is persistent in the environment. Its proven carcinogenic potential should be of special concern.*

*Even though most countries have banned or restricted the use of technical HCH as a pesticide, replacing it in most cases by the use of Lindane (99% gamma-HCH), the production process to obtain a ton of pure gamma-HCH yields 6 – 10 metric tonnes of the other isomers that must be disposed of or otherwise managed. Up to 70% of these waste isomers is alpha-HCH. As Lindane is the only isomer in the mixture that has insecticidal properties, there is very limited to no commercial value for the other isomers obtained. Because of this waste isomer problem, the production of HCH/Lindane has been a worldwide problem for years.*

*Other HCH isomers, like alpha-HCH, can be as toxic and persistent a contaminant as Lindane, or even more so. The continued use of Lindane in the world is causing this important pollution source. Global action is therefore needed to halt the pollution caused worldwide by Lindane production."*

**3. Additional Information**


- CEC, 2000. North American Commission on Environmental Cooperation: North American Regional Action Plan (NARAP) on Lindane and other HCH isomers. http://www.cec.org.

- USEPA, 2006. Assessment of Lindane and Other Hexachlorocyclohexane Isomers. U.S. Environmental Protection Agency. http://www.epa.gov/fedrgstr/EPA-PEST/2006/February/Day-08/p1103.htm.

- ATSDR, 2005. Toxicological Profile for Hexachlorocyclohexanes, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, August, 2005. http://www.atsdr.cdc.gov/toxprofiles/tp43.html.


**Secretariat Evaluation:**

The proposal identifies the chemical as required under Annex D 1 (a) and provides information on the chemical relating to the screening criteria set out in Annex D 1 (b-e). It includes a statement of the reasons for concern and the need for global control. The Secretariat is satisfied that the proposal, when combined with the additional information references, contains the information specified in Annex D.

# V. Beta-hexachlorocyclohexane proposal (Mexico)

| | | |
|---|---|---|
| **1(a). Chemical Identity** | (i) Names, CAS number, etc… | The IUPAC chemical name and CAS Registry number are provided. A synonym is also provided. |
| | (ii) Structure, isomers, etc… | The molecular weight, molecular formula and the structural formula are provided. |
| **1(b). Persistence** | (i) Evidence of half-life greater than… **or** | HCH isomers are resistant to abiotic processes like photolysis and hydrolysis (except at high pH), and microbial degradation is very slow. Soil half-lives ranged from 3-4 months in one study to 3.3-6.1 months in another (aerobic conditions). |
| | (ii) Evidence it is otherwise sufficiently persistent… | The isomeric structure of b-HCH is very resistant to degradation. |
| **1(c). Bioaccumulation** | (i) Evidence of BCF/BAF greater than… **or** | A BCF of 1460 was reported in zebra-fish. This is significantly higher than the BCFs of 1100 for a-HCH and 850 for g-HCH. BCFs range from 250-1500 on a dry weight basis or 500,000 on a lipid basis (variety of species).The log $K_{OW}$ value is reported to be 3.8. |
| | (ii) Evidence of other reasons for concern… **or** | None provided. |
| | (iii) Monitoring data indicating bio-accumulation potential… | Contamination of wildlife and human milk samples from the Arctic with b-HCH indicate bioaccumulation is extensive, although no data are provided in the proposal. Upper trophic level mammals may be able to efficiently eliminate g-HCH (Lindane) and to a smaller extent a-HCH, but not b-HCH. |
| **1(d). Potential for Long-range Environmental Transport** | (i) Measured levels of concern in distant locations… **or** | b-HCH tends to bio-accumulate to higher concentrations in upper trophic levels fishes, birds and mammals. It is the most abundant of the three HCH isomers found in the Arctic. b-HCH is also routinely found in Arctic sea water. |
| | (ii) Monitoring data showing transfer may have occurred… **or** | b-HCH has been measured in air arriving in the Arctic. It partitions into water easily and is scavenged by rain. It probably enters the Arctic by mechanisms involving wet deposition or partitioning into the North Pacific surface water and subsequently enters the Arctic in ocean currents passing through the Bering Strait. |
| | (iii) Environmental fate properties/models demonstrating the potential for transport…. | The half life of b-HCH in air is greater than 6 days. It is slightly less volatile than the other two HCH isomers. |
| **1(e). Adverse Effects** | (i) Evidence of adverse effects… **or** | There is no direct evidence of human or ecosystem health effects; however, the USEPA lists b-HCH as a 'possible human carcinogen' based on the incidence of hepatic nodules and hepatocellular carcinomas in male mice. |
| | (ii) Toxicity or ecotoxicity data that indicate potential for damage… | Limited evidence of liver cancer in male mice. Evidence of liver and kidney effects, changes to reproductive organs, some genotoxicity and neurological effects and capacity to cause endocrine disruption. |

## 2. Statement of Concern

Statement of the reasons for concern provided as follows:
*"Beta-HCH is the most persistent isomer of hexachlorcyclohexane. Due to its physicochemical properties it has the potential to bioaccumulate. Its listing as a possible human carcinogenic should also be of special concern.*

*Even though most countries have banned or restricted the use of technical HCH as a pesticide, replacing it in most cases by the use of Lindane (99% gamma-HCH), the production process to obtain a ton of pure gamma-HCH yields 6 – 10 metric tonnes of the other isomers that must be disposed of or otherwise managed. As Lindane is the only isomer in the mixture that has insecticidal properties, there is very limited to no commercial value for the other isomers obtained. Because of this waste isomer problem, the production of HCH/Lindane has been a worldwide problem for years.*

*Other HCH isomers, like beta-HCH, can be as toxic and persistent a contaminant as Lindane, or even more so. The continued use of Lindane in the world is causing this important pollution source. Global action is therefore needed to halt the pollution caused worldwide by Lindane production."*

## 3. Additional Information


- CEC, 2000. North American Commission on Environmental Cooperation: North American Regional Action Plan (NARAP) on Lindane and other HCH isomers. http://www.cec.org.

- USEPA, 2006. Assessment of Lindane and Other Hexachlorocyclohexane Isomers. U.S. Environmental Protection Agency. http://www.epa.gov/fedrgstr/EPA-PEST/2006/February/Day-08/p1103.htm.

- ATSDR, 2005. Toxicological Profile for Hexachlorocyclohexanes, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, August, 2005. http://www.atsdr.cdc.gov/toxprofiles/tp43.html.


**Secretariat Evaluation:**

The proposal identifies the chemical as required under Annex D 1 (a) and provides information on the chemical relating to the screening criteria set out in Annex D 1 (b-e). It includes a statement of the reasons for concern and the need for global control. The Secretariat is satisfied that the proposal, when combined with the additional information references, contains the information specified in Annex D.