

QUESTIONNAIRE

“Study to Support the Review of Waste-related issues in Annexes IV and V of Regulation (EC) 850/2004”¹

1) Aim of the questionnaire

The following questionnaire has been prepared by BiPRO GmbH (part of Ramboll)² in close coordination with the European Commission. The questionnaire aims at gathering up-to-date information and quantitative data on Persistent Organic Pollutants (POPs) and more specifically on waste related issues of certain “new POPs”, “candidate POPs” and “already listed POPs”. The information will provide the EU Commission with the necessary scientific basis to propose amendments to the POP Regulation (EC) 850/2004 (hereafter called “POP Regulation”), due to the listing of new substances and to the review of concentration limits for substances already listed. In addition, the study shall provide guidance on how wastes containing the new POPs may be managed.

2) Background information

POPs are a group of organic compounds that possess toxic properties, persist in the environment, bioaccumulate through the food web and pose a risk to human health and the environment. POPs are transported across international boundaries far from their sources through air, water and migratory species.

The "Protocol to the regional UNECE Convention on Long-Range Transboundary Air Pollution" (CLRTAP) and the Global "Stockholm Convention" on POPs are international, legally binding instruments aiming to reduce and eliminate the production, use and releases of POPs in the territories of all participating parties. Both contain provisions on the environmentally sound management of wastes consisting of, containing or contaminated by POPs (hereafter called “POP waste”).

Although substantial progress has been achieved in limiting the use and application of POPs and reduce their emission into the environment, there are ongoing releases into the environment as well as a constant cycling of substances released in the past. For an optimised approach to elimination, all sectors in the life cycle of a product and of anthropogenic emission sources need to be considered. In this framework, proper waste management can contribute substantially to the reduction of POP releases into the environment, and a comprehensive legislation on POP waste is a necessary pre-requisite.

The Stockholm Convention was implemented into EU Community law in 2004 by the POP Regulation. It foresees an obligation to generally destroy or irreversible transform the POP content

¹ Information related to this project on behalf of the European Commission is provided on a dedicated project website at <http://pops-and-waste.bipro.de>.

² BiPRO GmbH (part of Ramboll), Munich, Germany (www.bipro.de), has been contracted by the European Commission to carry out the “Study to support the review of waste-related issues in Annexes IV and V of Regulation (EC) 850/2004”

of waste above certain concentration limits (the 'low POP content'). In addition, in exceptional cases, waste above the limits may be otherwise managed with defined operations for specified waste types if destruction or irreversible transformation do not represent the environmentally preferable option and the concentration in such wastes are below another threshold (the 'high POP content').³

In 2017, the Conference of the Parties of the Stockholm Convention (SC) decided to add three new substances to the relevant Annexes. Every time a substance is listed as a POP by the SC, the parties have to reflect the listing in domestic legislation. The EU as a party to the Convention is requested to amend the POP Regulation by May 2018 to include these 'new POPs'.

In addition, three substances are currently under review procedures and are likely to be added to the list of POPs under the SC in the next years (the so-called "candidate POPs"). For the new POPs and the candidate POPs, there is a need to improve the knowledge basis regarding quantities that were used in the past, their concentrations and sources, as well as regarding aspects related to waste management in terms of disposal and recycling paths. This information is needed to assess possible disposal options and to establish concentration limits for waste⁴. Consequently, further analysis is needed for the following substances:

- **“new POPs”**: Decabromodiphenylether (decaBDE), short-chain chlorinated paraffins (SCCPs) and Hexachlorobutadiene (HCBD)
- **“candidate POPs”**: Dicofol, Pentadecafluorooctanoic acid (PFOA, perfluorooctanoic acid) and its salts and PFOA-related compounds, Perfluorohexanoic acid (PFHxS) and its salts and PFHxS-related compounds

Furthermore, new scientific information on three substances already listed in the annexes of the SC has raised the necessity of reviewing already established concentration limits. Therefore, the following substances require renewed analysis and, potentially adjustment of the concentration limits:

- **“already listed POPs”**: Hexabromocyclododecane (HBCD), Polychlorinated Biphenyls (PCB), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)

4) Instructions on using the questionnaire

Please note that some of the relevant questions might have already been addressed in requests for information under the SC or the Basel Convention (BC). Submissions from EU member states related to these requests for information will be reviewed and considered as appropriate for the purpose of the actual study.

The present questionnaire is provided as an MS-Word-file and it would be much appreciated to receive your responses using this electronic version. All questions are numbered and highlighted

³ Article 7 of Regulation EC (No) 850/2004

⁴ Note that for SCCPs and HCBD concentration limits are already established in the Annexes IV and V of the POP Regulation. Only for decaBDE new concentration limits need to be established.

in grey. All fields where input is desired are blue.

The questionnaire is structured in three main sections.

- **Section I – “new POPs”:** decaBDE, SCCPs and HCBd
- **Section II – “candidate POPs”:** dicofol, PFOA and PFHxS
- **Section III – “already listed POPs”:** HBCD, PCB and PCDD/PCDF

Please only fill in the sections that you consider relevant and where you can provide specific information. Please provide specific references wherever possible and do not hesitate to also send us additional background information in form of documents, reports, data sets or as links to websites.

We recommend to quickly screen all questions of a section before starting to fill in the information. If a question is unclear or if you desire to discuss a certain aspect, please do not hesitate to contact one of the following contact persons of the project team:

Contact person	E-mail address	Telephone
Mr Alexander Potrykus	apot@ramboll.com	+49 89 978970-100
Mr Milos Milunov	mo@ramboll.com	

All information provided will be used in a transparent and traceable way for the present study. Provided that your agreement is expressed below, submitted non-confidential information will be published on the dedicated project related website⁵. If you wish to submit information on a confidential basis, please indicate this in your response. Any confidential information will only be used in anonymous or aggregated form.

Please indicate in the following table whether you agree with the publication of your answers to the Questionnaires:

Section	Y/N
I.I Occurrence of “new POPs” decaBDE, SCCPs and HCBd	
I.II Recycling Operations/Waste Management Options for “new POPs”	
I.III Concentration Limits for decaBDE, SCCPs and HCBd	
II.I Occurrence of “candidate POPs” Dicofol, PFOA and PFHxS	
II.II Recycling Operations/Waste Management Options for “candidate POPs”	
II.III. Concentration Limits for dicofol, PFOA and PFHxS	

⁵ <http://pops-and-waste.bipro.de>

III Already listed POPs	
------------------------------	--

Please return the completed questionnaire and any related documents to popwaste2018@ramboll.com before 29 March 2018.

In case you are rather interested to discuss with us by telephone, please let us know when we could reach you.

Name of Institution:	German Environment Agency (Umweltbundesamt)
Country:	Germany
City/ CIP Code:	06844 Dessau-Roßlau
Street:	Wörlitzer Platz 1
Contact person:	Caren Rauert/ Mareike Röhreich
E-mail:	caren.rauert@uba.de / mareike.roehreich@uba.de
Phone:	+49-340-2103-2950 / -3089
Remark:	_____

Section I – “new POPs”

Decabromodiphenylether (decaBDE); short-chain chlorinated paraffins (SCCPs); Hexachlorobutadiene (HCBd)

I. Occurrence of “new POPs” decaBDE, SCCPs and HCBd (articles in use, waste, recycled articles as well as (production) processes and unintentional releases)

1. a) Please indicate whether your country /company has **stockpiles of decaBDE, SCCPs or HCBd**.

b) *If yes, please provide information on types, quantity, concentrations, etc.*

a)

b)

2. Please indicate any known **occurrence and concentration of the “new POPs” decaBDE, SCCPs and HCBd in different articles in use, waste categories and recycled articles.**

decaBDE	Specification of waste/article	Concentration [mg/kg]
Articles in use	<ul style="list-style-type: none"> - Plastic polymers in Waste electric and electronic equipment (WEEE) - Plastic polymers in End of life vehicles (ELV) 	10 to 15% 0,2 to 590 mg/kg
Wastes	light shredder fractions (ELV and WEEE)	
Recycled articles		
SCCPs	Specification of waste/article	Concentration [mg/kg]
Articles in use		
Wastes	Rubber wastes Sealants Conveyor belts for underground use	Around 10%
Recycled articles		
HCBd	Specification of waste/article	Concentration [mg/kg]
Articles in use	Not relevant in Germany	
Wastes		
Recycled articles		

Remarks:

Concentrations for DecaBDE are results from a recent study (Bipro 2017-2019) on PCBs and DecaBDE in waste

3. Please provide information on quantities of waste containing “new POPs” that are currently generated, then disposed of or recycled

“new POPs”	Specification of waste	Waste generated (in kt)	Waste disposed of (in kt)	Waste recycled (in kt)
decaBDE	Study under development			
SCCPs	Rubber wastes	1.76 (2013)	186	312
	Sealants	0.33 (2013)	0.2	0.1
HCBd	Not relevant in Germany			

4. Please provide information on wastes containing “new POPs” that are currently recycled (now or in the near future) and on the extent of recycling. If possible, please specify the types of new articles produced from the recycled material.

“new POPs”	Types of waste recycled	Recycling rate [%]	New articles produced from recycled material
decaBDE	Study under development		
SCCPs	Rubber wastes	62%	Granules for rubber production
	Sealants		
HCBd	Not relevant		

Remarks question 2 on DecaBDE: Occurrence and mass flow of Deca BDE is subject of an ongoing project carried out by BiPro

Question 3,4: Results from Bipro Study on new POPs in Waste (2015)

5. Please indicate up-to-date (reference) measurement (analytical) methods for identifying the presence and levels of the listed “new POPs” in waste.

Research projects on double detection of DecaBDE showed that sample preparation and grinding to small particle sizes is crucial. There is the risk of too low analytical results, if waste sample particles are insufficiently milled and not cooled during milling/grinding.

6. Please indicate known inexpensive *screening methods* for identifying wastes containing “new POPs”

A typical screening method is the measurement of total bromine. This method is also listed in CENELEC-Norm TS 50625-3-1 but is unspecific for single substances. For DecaBDE heavy media separation is the common method used to separate fractions with/without bromine. Another approach is working with “negative lists” for WEEE components that possibly contain BFRs. UBA is working on such a list, but no results can be published yet.

7. Please indicate any known (*production*) processes using decaBDE, SCCPs and HCBd as well as options for the environmental management of their operation and potential related *unintentional releases of these POPs* into the environment.

II. Waste Management Options/Recycling Operations for “new POPs”

8. Waste separation for decaBDE, SCCPs and/or HCBd containing wastes:
 a) How can be **distinguished** between **contaminated and non-contaminated waste**?
 b) Which **separation operations** should preferably be used **in practice to separate** contaminated from non-contaminated waste (please provide further details if available)?
 c) What should be the preferred **waste management options for the contaminated waste fraction** (please provide justification and further details if available e.g. related costs)?

a) For SCCPs in rubber wastes and sealants it can only be distinguished by analytical techniques. For DecaBDE (and other brominated flame retardants) contained in plastic parts the float sink separation of the fluff is often used to separate plastic parts (after the shredding process)

b) Preferable separation operations	Relevant waste / new POP	Possible health risks for workers during separation of waste	Separation costs / ton of waste	Explanation / further information
separation of rubber wastes during demolition of buildings; no heat developing equipment for separation	SCCP	Dust from treatment operation		See UBA Bipro Study on new POPs in Waste (2015)
2.				
3.				

Remarks:

Bipro Study on new POPs in waste (2015):

https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/texte_34_2015_ermittlung_von_potenziell_pop_haltigen_abfaellen.pdf

c)	Preferable waste management operations	Relevant waste / new POP	Possible health risks for workers during waste management (e.g. recycling)	Management costs / ton of waste	Explanation / further information
1.					
2.					
3.					

Remarks:

III. Concentration Limits for decaBDE, SCCPs and HCBd

9. Are you aware of any existing concentration limits for decaBDE in waste?

The CENELEC standard TS 50625-3-1 sets a limit of 2000 ppm bromine for fractions destined for recycling. This sum parameter includes the bromine content of Deca-BDE and allows for the fact, that the bromine can originate from either a POP-regulated substance or a non-regulated substance. Meeting the 2000 ppm bromine limit should ensure to meet the 1000 ppm limit concerning the regulated brominated flame retardants.

10. Which concentration limits for decaBDE in waste according to the POP Regulation would you recommend? Please justify.

Subject to an ongoing research project, no results yet

11. At which lower concentration limits for decaBDE in waste would you expect relevant impacts (e.g. on recycling industry)? Please justify.

Subject to an ongoing research project, no results yet

12. Is there a continued need for the derogation provided for POP-PBDEs in articles produced from recycled materials in the POPs Regulation (i.e. level of 1,000 mg/kg or 0.1%)

by weight) of POP-PBDEs allowed in articles produced partially or fully from recycled materials?⁶ Please justify.

13. Is an adjustment of existing POP limit values for SCCPs⁷ and HCBd⁸, as specified in Annex IV and V of the EU POP Regulation, and/or additional measures required (e.g. due to any notable developments)? Please justify.

No adjustment necessary

14. Please indicate if, beyond the EU POP Regulation, there are any adjustments to EU legislation needed, resulting from the listing of the “new POPs” decaBDE, SCCPs and HCBd under the Stockholm Convention.

No adjustment necessary

15. Can you provide any other information or information sources relevant to Section I of this questionnaire on the “new POPs”?

⁶ See Annex I Regulation (EC) No 850/2004

⁷ Regulation (EC) 850/2004, Annex IV, concentration limit referred to in Article 7(4)(a): 10 000 mg/kg;
Maximum concentration limits of substance listed in Annex IV: 10 000 mg/kg

⁸ Regulation (EC) 850/2004, Annex IV, concentration limit referred to in Article 7(4)(a): 100 mg/kg;
Maximum concentration limits of substance listed in Annex IV: 1000 mg/kg

Section II – “candidate POPs”

Dicofol, Pentadecafluorooctanoic acid (PFOA, perfluorooctanoic acid), its salts and PFOA-related compounds, Perfluorohexanoic acid (PFHxS), its salts and PFHxS-related compounds

I. Occurrence of “candidate POPs” Dicofol, PFOA and PFHxS (articles in use, waste, recycled articles as well as production processes and unintentional releases)

16. a) Please indicate whether your country /company has *stockpiles* of “candidate POPs” listed.

b) If *yes*, please provide information on types, quantity, concentrations, etc.

a)

b)

17. Please indicate any known *occurrence and concentration of the “candidate POPs”*, in different *articles in use, waste categories and recycled articles*.

a) Dicofol	Specification of waste/article	Concentration [mg/kg]
Articles in use	Not relevant in Germany	
Wastes		
Recycled articles		
b) PFOA, its salts and PFOA-related compounds	Specification of waste/article	Concentration [mg/kg]
Articles in use	A study will be launched in 2019	
Wastes		
Recycled articles		
c) PFHxS, its salts and PFHxS-related compounds	Specification of waste/article	Concentration [mg/kg]
Articles in use	A study will be launched in 2019	
Wastes		
Recycled articles		

Remarks:

The occurrence of PFOA/PHFX in waste streams (except physico-chemical treatment) will probably be investigated in 2019

18. Please provide information on quantities of waste containing “candidate POPs” that are currently generated, then disposed of or recycled

“candidate POPs”	Specification of waste	Waste generated (in kt)	Waste disposed of (in kt)	Waste recycled (in kt)
Dicofol	Not relevant in Germany			
PFOA, its salts and PFOA-related compounds	A study will be launched in 2019			
PFHxS, its salts and PFHxS-related compounds	A study will be launched in 2019			

19. Please provide information on wastes containing “candidate POPs” that are currently recycled (or possibly in the future) and the extent of recycling. If possible, please specify the types of new articles produced from the recycled material?

“candidate POPs”	Types of waste recycled currently (or in the future)	Recycling rate [%]	New articles produced from recycled material
Dicofol	Not relevant in Germany		
PFOA, its salts and PFOA-related compounds	A study will be launched in 2019		
PFHxS, its salts and PFHxS-related compounds	A study will be launched in 2019		

Remarks:

20. Please indicate up-to-date (reference) measurement (analytical) methods for identifying the presence and levels of the listed “candidate POPs” in waste.

21. Please indicate known inexpensive screening methods for identifying waste to be classified as POPs wastes due to their content of the listed “candidate POPs”.

22. Please indicate any known (production) processes using dicofol, PFOA and PFHxS as well as options for the environmental management of their operation and potential related unintentional releases of these POPs into the environment.

II. Waste Management Options/Recycling Operations/for “candidate POPs”

23. Waste separation for dicofol, PFOA and PFHxS containing waste:
 a) How can be **distinguished** between **contaminated and non-contaminated waste**?
 b) Which **separation operations** should preferably be used **in practice to separate** contaminated from non-contaminated waste (please provide further details if available)?
 c) What should be the preferred **waste management option for the contaminated waste fraction** (please provide justification and further details if available e.g. related costs)?

a) For PFOA, PFHxS a study will be launched by UBA starting in 2019

b)	Preferable separation operation	Relevant waste/candidate POP	Possible health risks for workers during separation of waste	Separation costs /ton of waste	Explanation / further information
1.					
2.					
3.					

Remarks:

c)

Preferable waste management operation	Relevant waste/candidate POP	Possible health risks for workers during waste management (e.g. recycling)	Management costs / ton of waste	Explanation / further information
1.				
2.				
3.				

Remarks:

III. Concentration Limits for dicofol, PFOA and PFHxS

24. Are you aware of any existing concentration limits for dicofol, PFOA and PFHxS in waste? (please list limits individually)

PFOA and PFHxS will be part of a study starting in 2019

25. Which concentration limits for dicofol, PFOA and PFHxS in waste according to the POP Regulation would you recommend? Please justify.

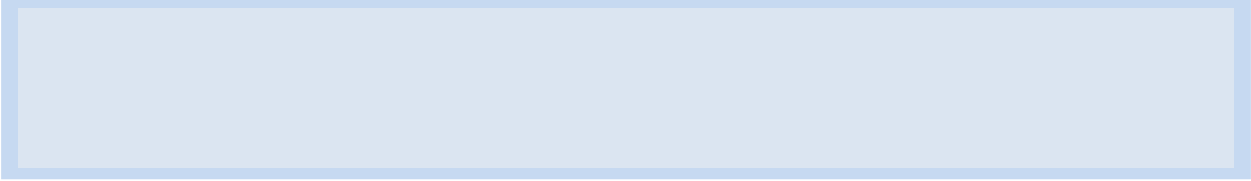
See answer to question 24

26. At which lower concentration limits for dicofol, PFOA and PFHxS in waste would you expect relevant impacts (e.g. on recycling industry)? Please justify.

See answer to question 24

27. Please indicate if, beyond the EU POP Regulation, there are any adjustments to EU legislation needed, resulting from the listing of the candidate POPs under the Stockholm Convention.

28. *Can you provide any other information or information sources relevant to Section II of this questionnaire on the “candidate POPs”?*



Section III – “already listed POPs”

Hexabromocyclododecane (HBCD), Polychlorinated Biphenyls (PCB), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)

29. *Are the existing concentration limits in Annex IV and V of the EU POP Regulation for HBCD, PCB and PCDD/F appropriate to ensure a sufficient level of environmental and health protection or is it necessary to adjust **them** (e.g. due to any notable developments such as new scientific data and technical progress, etc.)? Please justify.*

No adjustment necessary

30. *If the existing limit values need to be adjusted, which **concentration limits for HBCD, PCB and PCDD/F in waste** would you recommend and why?*

31. *What would be the **major impacts from a possible adjustment of existing limit values of Annex IV or V of the EU POP Regulation**? Please justify.*