# Questionnaire for associations representing waste management companies

A consortium comprising RPA Europe, Risk & Policy Analysts (RPA), INERIS, and Bio Innovation Service has been contracted by the European Commission (DG Environment) to prepare an Impact Assessment study to support the preparation of a legislative proposal to amend Annexes IV and V of the Regulation (EU) No 2019/1021 (hereinafter the POP Regulation).

This study builds on existing information on the current situation (which includes three previous studies commissioned by DG Environment published in 2005[[1]](#footnote-2), 2011[[2]](#footnote-3) and 2019[[3]](#footnote-4)) and comprises the following tasks:

* Task 1: Update of the information on the mass flows of POP substances;
* Task 2: Assessment of the 2005 WHO Toxic Equivalency Factor (TEF) values for dioxin-like (dl) PCBs;
* Task 3: Survey of sampling and analytical methods for PBDEs, HBCDD and SCCPs in POP waste;
* Task 4: Impact assessment of changes to Annex IV of the POPs Regulation - Low POP Content Limit (LPCL) options for eight POP substances/substance groups; and
* Task 5: Recommendations and analysis of uncertainties.

The following substances/substance groups are within the scope of this study:

* Polybrominated diphenyl ethers (PBDEs) already included in Annex IV of the POPs Regulation[[4]](#footnote-5), with particular focus on decabromodiphenyl ether (decaBDE);
* Hexabromocyclododecane (HBCDD);
* Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCPs);
* Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds;
* Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds;
* Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD & PCDF);
* Pentachlorophenol (PCP) and its salts and esters; and
* Polychlorinated biphenyls (PCBs) (differentiating between dioxin-like (dl) PCBs and non-dioxin like (ndl) PCBs).

The purpose of this consultation is to collect additional information on the baseline situation and the impacts of the different LPCL options on industry stakeholders.

This questionnaire is intended for **associations representing** **waste management (disposal & recovery) companies.** Examples of relevant waste management activities that these companies might be involved in include sorting, transportation, treatment, recycling, incineration, permanent, storage, etc.

Separate questionnaires are available for:

1. waste management companies;
2. industry associations representing users of secondary raw materials;
3. Member State authorities;
4. NGOs and other stakeholders; and
5. Manufacturers of sampling/analysis equipment.

The deadline for completion of the questionnaire is **15 June 2020**.

The questionnaire consists of the following parts:

* Part A: About your organisation;
* Part B: Relevant waste streams and presence of POPs;
* Part C: Relevant operations and POP concentrations;
* Part D: Sampling and analytical methods;
* Part E: Impacts of the different LPCL options; and
* Part F: Further communication.

If you have any questions about this study, please contact daniel.vencovsky@rpaltd.co.uk or +44 (0)1508 528 465.

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| ***Definitions*** | |
| POP | Persistent organic pollutant |
| C&D | Construction and demolition |
| DecaBDE | Decabromodiphenyl ether |
| LPCL | Low POP concentration limit in Annex IV of the POPs Regulation |
| HBCDD | Hexabromocyclododecane |
| PBDEs | Polybrominated diphenyl ethers |
| SCCPs | Short chain chlorinated paraffins |
| PFOA | Perfluorooctanoic acid |
| PFHxS | Perfluorohexane sulfonate |
| PCDD/Fs | Polychlorinated dibenzodioxins/polychlorinated dibenzofurans |
| PCP | Pentachlorophenol |

## A) About your association

A1) Please provide the following information.

| **Question** | **Answer** |
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| Association |  |
| Country (or countries covered) |  |
| Name of contact person |  |
| Email address of contact person |  |
| Telephone number of contact person |  |

A2) Please specify the activities of your members (if possible, using the disposal and recovery categories in the Waste Framework Directive[[5]](#footnote-6)).

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| **Type** | **Activities** |
| **Disposal** | ☐ D 1 Deposit into or on to land (e.g. landfill, etc.) |
| ☐ D 5 Specially engineered landfill or D 12 Permanent storage |
| ☐ D 9 Physico-chemical treatment (with subsequent disposal by means of D 1 to D 12) |
| ☐ D 10 Incineration on land |
| ☐ D 13 Blending or mixing, D 14 Repackaging, D 15 Storage |
| ☐ Other (please specify below) |
| **Recovery** | ☐ R 1 Use principally as a fuel or other means to generate energy |
| ☐ R 2, R3, R5, R11 Recycling/reclamation/re-use other than R4 |
| ☐ R 4 Recycling/reclamation of metals and metal compounds |
| ☐ R 12 Exchange of waste, R13 Storage of waste |
| ☐ Other (please specify below) |
| **Collection & sorting** | ☐ Waste collection |
| ☐ Waste sorting and/or separation (other than D13, D14, D15, R12, R13) |
| ☐ Transport |
| ☐ Other (please specify below) |

If ’Other’, please specify:

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Please provide further details describing the operations of your member companies, e.g. please specify the type of incineration that your member companies are involved in, e.g. municipal waste incineration, hazardous waste incineration, cement kilns, etc. or the activities undertaken by your company with regard to recycling:

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A3) What proportion of your member companies are Small and Medium Enterprises?

*For enterprise size definitions, please refer to* [*http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition/index\_en.htm*](http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition/index_en.htm)

| **Company size** | **Proportion of member companies** |
| --- | --- |
| Micro enterprise (less than 10 persons employed) |  |
| Small enterprise (10-49 persons employed) |  |
| Medium-sized enterprise (50-249 persons employed) |  |
| Large enterprise (250 or more persons employed) |  |

## B) Relevant waste streams and presence of POPs

B1) Are you aware of any of the following POP substances/substance groups being present in the waste streams handled by your member companies?

☐ *Polybrominated diphenyl ethers (PBDEs) included in Annex IV of the POPs Regulation, in particular decabromodiphenyl ether (decaBDE)*

☐ *Hexabromocyclododecane (HBCDD)*

☐ *Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCPs)*

☐ *Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds*

☐ *Perfluorohexane sulfonic acid (PFHxS), its salts and PFHxS-related compounds*

☐ *Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD & PCDF)*

☐ *Pentachlorophenol (PCP) and its salts and esters*

☐ *Polychlorinated biphenyls (PCBs)*

B2) Please indicate in which waste streams the relevant substances/substance groups are present.

| **Waste stream** | **decaBDE** | **Other PBDEs** | **HBCDD** | **SCCPs** | **PFOA, salts & related compounds** | **PFHxS, salts & related compounds** | **PCDD/F** | **PCP, salts & esters** | **PCBs** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Construction & demolition (C&D) waste e.g. insulation material (EPS/XPS), plastics, wood etc. |  |  |  |  |  |  |  |  |  |
| Metals |  |  |  |  |  |  |  |  |  |
| Plastics |  |  |  |  |  |  |  |  |  |
| Paper |  |  |  |  |  |  |  |  |  |
| Tyres & rubber |  |  |  |  |  |  |  |  |  |
| Textiles |  |  |  |  |  |  |  |  |  |
| Electrical and electronic waste (WEEE) |  |  |  |  |  |  |  |  |  |
| End of life vehicles (ELV) |  |  |  |  |  |  |  |  |  |
| Wood |  |  |  |  |  |  |  |  |  |
| Other, please specify below |  |  |  |  |  |  |  |  |  |

If ‘Other’, please explain in the box below.

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B3) Please provide further information on the waste streams in which the relevant substances/substance groups are present, e.g. the types of products that the relevant substances/substance groups are present in. Examples of the waste streams and products that have been identified as relevant or potentially relevant, based on existing literature, are provided below.

| **Substance/ substance group** | **Examples of relevant waste streams identified through literature** | **Details of the relevant waste handled by your members** |
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| PBDEs, in particular decaBDE | * WEEE plastics * Plastics & textiles from ELVs * Plastics from C&D waste |  |
| HBCDD | * Expanded polystyrene (EPS) and * Extruded polystyrene (XPS) in C&D waste * Packaging (especially EPS packaging) * WEEE * Textiles |  |
| SCCPs | * General rubber goods * Sealants and adhesives in C&D waste * Imported consumer products, e.g. cosmetic products, toys, textiles, clothing, personal care products, domestic products such as detergents |  |
| PFOA its salts and PFOA-related compounds | * Semiconductors in WEEE, ELV * Municipal solid waste * Photographic paper * Wire and cable coatings, linings for pipes, tanks and equipment in chemical and pharmaceutical manufacturing, lubricants, non-stick cookware * Textiles and leather (including ELV, worker protection clothing, other clothes, shoes, carpets and furniture) |  |
| PFHxS, its salts and PFHxS-related compounds | * Firefighting foams * Metal plated products * Textiles (e.g. outdoor clothing, worker protection clothing, ELV), leather and upholstery * WEEE (semiconductors) * Impregnation/proofing (for protection from damp, fungus, etc.) * Other products (e.g. synthetic materials, plastics, ski waxes, cookware) |  |
| PCDD/F | * WEEE (semiconductors) * C & D waste (asphalt concrete with composite asphalt fillers) * Fly ash, incinerator bottom ash, coal combustion ash |  |
| PCP, its salts and esters | * Wood (pre-2008 or imported): impregnated wood, treated indoor wood panels and boards, industrial wood * Textiles (leather products, outdoor textiles and rope) |  |

If you want to provide further information, please do so in the box below.

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B4) Do you have any information (e.g. concentrations, amounts, products, disposal or recovery methods) on plastics that contain PBDEs in C&D waste?

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B5) Do you have any information (e.g. concentrations, amounts, products, disposal or recovery methods) on HBCDD-containing Expanded polystyrene (EPS) and Extruded polystyrene (XPS) in C&D waste or HBCDD-containing packaging waste?

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B6) Do you have any information on the presence and concentrations of SCCPs in consumer goods from non-EU countries?

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B7) Do you have any information on the recycling of rubber from conveyor belts that contain SCCPs?

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B8) Do you have any information (e.g. concentrations, amounts, products, disposal or recovery methods) on the presence of PFOA and PFHxS (and their salts and related compounds) in waste streams and potential recyclates (particularly as regards ELV textiles, textiles used in worker protection and in semiconductors)?

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B9) Do you have any information (e.g. concentrations, amounts, products, disposal or recovery methods) on the presence of PCDD/Fs and dioxin-like (dl) PCBs in waste, in particular fly and bottom ash from municipal waste incinerators and other thermal processes, especially where subsequent material recovery is carried out?

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B10) To the extent possible, please estimate the annual turnover and profits associated with the relevant materials and activities listed in B3 relevant to your member companies (please provide a breakdown by type of waste stream and treatment process if possible).

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B11) To the extent possible, please estimate the employment associated with the relevant materials and activities listed in B3 relevant to member companies (please provide a breakdown by waste stream and treatment process if possible).

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## C) Relevant operations and POP concentrations

C1) Please estimate the proportion of your member companies that handle waste that contains one or more of the relevant POP substances/substance groups listed in B1.

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C2) For the waste streams for which you have identified the presence of the relevant POPs in your response to Question B3, please describe the relevant activities undertaken in your member companies (e.g. sorting, pre-treatment, mechanical/chemical recycling, incineration, etc.) and, if relevant, the final destination (e.g. recycling, landfill, incineration), downstream user or the final product at the end of the process undertaken in your member companies .

A hypothetical example is provided in the shaded cells at the top of the table.

| **Substance/ substance group** | **Waste stream** | **Relevant operation(s)** | **Final output(s)** | **Customer/ destination** |
| --- | --- | --- | --- | --- |
| *Hypothetical example 1* | *Plastics from ELV* | *Separation of POP containing plastics not possible, all plastics shredded, density separated, shredded low fraction sold as recyclate* | *Finely ground recyclate*  *Scrap*  *High-POP content particles* | *Recyclate – sold to companies in the automotive sector*  *Scrap – landfilled*  *High-POP content particles - incinerated* |
| *Hypothetical example 2* | *High-POP content ELV plastic particles separated during recycling and sent for incineration* | *Incineration with energy recovery* | *Fly/bottom ash with very low POP content* | *Application on land* |
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Please provide further information in the box below.

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C3) For the waste streams set out in your response to Question C2, please estimate the tonnages of waste handled and, if you have such information, please indicate the concentration of the relevant POPs (in mg/kg).

| **Substance/ substance group** | **Waste stream** | **Quantities of waste handled (tonnes per year)** | **Substance/substance group concentrations (mg/kg)** |
| --- | --- | --- | --- |
| *Hypothetical example* | *Plastics from ELV* | *1.7 tonnes* | *Range 0-10,000 mg/kg in ELV plastics, range 0-2,000 in recyclate, average 1,000 mg/kg in ELV plastics and recyclate that is sold on* |
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Please provide further information in the box below.

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C4) Do you expect to see any changes to the relevant waste volumes, POP concentrations, or disposal and recovery methods in the future?

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## D) Sampling & analytical methods

D1) If you have such information, please specify the arrangements and technologies for the detection and sorting of POP containing material in POP waste streams.

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D2) If you have such information, please specify how the relevant waste streams are sampled and how the content of the relevant POPs is measured. If possible, please attach any sampling plans, analytical reports or other relevant documents you may be willing to share to your response.

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## E) Impacts of the different LPCL options

The Low POP Content Limit (LPLC) values assessed in this study are set out below. Where the POP content in waste exceeds an LPCL in Annex IV of the POPs Regulation, it has to be destroyed or irreversibly transformed so that the remaining waste and releases do not exhibit the characteristics of POPs – this can be achieved by means of one of the disposal and recovery options permitted in Part 1 of Annex V:

* D9: Physico-chemical treatment
* D10: Incineration on land
* R1: Incineration with energy recovery
* R4: Recycling/reclamation of metals and metal compounds (under specific conditions)

Under specific conditions, permanent storage (D5, D12) may also be allowed under Part 2 of Annex V for certain POPs and types of waste.

| LPCL options assessed in this study | | | | | | | | |
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| Option | **Sum PBDEs (mg/kg)** | SCCPs (mg/kg) | HBCDD (mg/kg) | PFOA, salts and  related compounds  (mg/kg) | PFHxS, salts and related  compounds  (mg/kg) | Dioxins &  furans\*\*\*  (mg/kg) | PCBs (mg/kg) | PCP (mg/kg) |
| Option 1 MAX\* | 1,000 | 10,000 | 1,000 | - | - | 0.015 | 50 (both dl-PCBs and ndl-PCBs) | - |
| Option 2 MID | 500 | 1,500 | 500 | 50 -PFOA & salts;  2,000 —related  compounds | 50-PFHxS&  salts;  2,000 —related  compounds | 0.010 | \*\*\*\*\* | 100 |
| Option 3 MIN | 200 | 420 | 100 | 0.025 - PFOA & salts;  1 —related  compounds\*\* | 0.025 - PFHxS & salts;  1 — related compounds | 0.005\*\*\*\* | - |
| Notes: \* Where available, these correspond to the current LPLCs in Annex IV of the POPs Regulation. \*\* Based on REACH restriction limits — Regulation (EU) 2017/1000. \*\*\* Potentially including dl-PCBs. \*\*\*\* with the option to establish a limit of 0.001 mg/kg to the application of fly ashes on land is also considered in this study. \*\*\*\*\* Possible options for future change are: a) propose a limit that is specific to dl-PCBs or b) include dl-PCBs together within the limit value for dioxins and furans. | | | | | | | | |

E1) What would be the consequences of setting the Low POP content limit according to the options set out above for your member companies? Please select all the options that are likely to apply.

a) The limit can be met without implementing any technical or organisational changes.

b) The limit can be met but companies would need to implement changes which require time and investment (if so, please provide details in Box E2).

c) The limit cannot be met for organisational or economic reasons and companies would have to discontinue the relevant activities (if this is the case, please use Box E2 to provide details on the expected socio-economic impacts such as loss of employment, loss of contracts/business opportunities, foregone profits, etc).

d) The limit cannot be met for technical reasons and companies would have to discontinue the relevant activities (if so, please provide details in Box E2).

e) The limit cannot be met for other reasons and companies would have to discontinue the relevant activities (if so, please provide details in Box E2).

| LPCL options assessed in this study | | | | | | | | |
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| Option | Outcome | **Sum PBDEs (mg/kg)** | SCCPs (mg/kg) | HBCDD (mg/kg) | PFOA, salts and  related compounds  (mg/kg) | PFHxS, salts and related  compounds  (mg/kg) | Dioxins &  furans\*\*  (mg/kg) | PCP (mg/kg) |
| Option 1 MAX | A – no changes needed | ☐ | ☐ | ☐ | N/A | N/A | ☐ | N/A |
| B – changes needed | ☐ | ☐ | ☐ | N/A | N/A | ☐ | N/A |
| Option 2 MID | A – no changes needed | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| B – changes needed | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| C – not feasible for econ. reasons | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| D – not feasible for tech. reasons | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| E – not feasible for other reasons (please specify under E2) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Option 3 MIN | A – no changes needed | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | N/A |
| B – changes needed | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | N/A |
| C – not feasible for econ. reasons | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | N/A |
| D – not feasible for tech. reasons | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | N/A |
| E – not feasible for other reasons (please specify under E2) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | N/A |

E2) Please describe the nature of the changes that in your view would be brought about as a result of adopting one or another LPCL values (e.g. changes to the sorting process, reduced possibility to landfill or recycle, discontinuation of activity, etc.) and specify the substances to which your comments refer.

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E3) What are your views on the current capabilities of detection and sorting technologies and what do you think will be required to achieve better separation of POP containing material in POP waste streams and delivering better recovery of usable material?

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E4) Please estimate the cost consequences of the resulting changes per tonne of waste.

| **Substance/ substance group** | **Waste stream** | **Summary of changes** | **Net cost consequences (€ per tonne)** |
| --- | --- | --- | --- |
| *Hypothetical example 1* | *Plastics from ELV* | *70% incinerated (up from 30%)*  *30% recycled (down from 70%)* | *Recycling revenue lost €2,000 per tonne*  *Incineration cost €2,000 per tonne* |
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If you want to provide further information on the capital and operating costs that your members would incur, please do so in the box below.

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E5) Are there likely to be any other impacts on your member companies, e.g. on the quality of your products/services?

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| ☐ *Yes* |
| ☐ *No* |
| ☐ *Do not know* |

If YES, please elaborate.

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E6) Do you expect there to be any unintended negative consequences, e.g. on emissions of greenhouse gases, ozone-depleting substances and emissions of other hazardous substances, including other POP substances, resulting from the treatment of the most relevant POP-related waste streams (due to changes to the processing of the relevant waste streams or increased incineration)?

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| ☐ *Yes* |
| ☐ *No* |
| ☐ *Do not know* |

If YES, please elaborate.

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E7) Do you expect there to be any unintended positive consequences resulting from the treatment of the most relevant POP-related waste streams (due to changes to the processing of the relevant waste streams or increased incineration)?

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| ☐ *Yes* |
| ☐ *No* |
| ☐ *Do not know* |

If YES, please elaborate.

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E8) Do you have any indication that the LPCL options could impact on waste management of waste streams in which these substances are present as impurities of other substances (e.g. for PFOA in C6 PFAS and SCCPs in MCCPs)?

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E9) As regards PCB, the current limit of 50 mg/kg covers both dioxin like (dl)-PCBs and non-dioxin like (ndl)-PCBs. Which of the following LPCL options for dl-PCBs would you support?

* Option 1: a limit of 50 mg/kg covering both dl-PCBs and ndl-PCBs
* Option 2: establishing a limit that is specific to ndl-PCBs (value to be determined)
* Option 3: inclusion of dl-PCBs together within the limit value for dioxins and furans

| **Option for dl-PCBs** | **Support** | **Do not support** | **Reasons/potential impacts** |
| --- | --- | --- | --- |
| Option 1: 50 mg/kg for both dl-PCBs and ndl-PCBs | ☐ | ☐ |  |
| Option 2: Specific limit for dl-PCBs | ☐ | ☐ |  |
| Option 3: Application of the PCDD/F LPCL to dl-PCBs | ☐ | ☐ |  |

If you support Option 2 (a specific LPCL for dl-PCBs), what should the LPCL value be?

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## F) Further communication

F1) **More detailed telephone discussion:** Would you be willing to take part in a follow up interview to discuss the issues raised in this questionnaire in more detail?

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| ☐ Yes | ☐ No |

1. BiPRO (2005): Study to facilitate the implementation of certain waste related provisions

   of the Regulation on Persistent Organic Pollutants (POPs). Available at: <https://ec.europa.eu/environment/waste/studies/pdf/pops_waste_full_report.pdf>. [↑](#footnote-ref-2)
2. BiPRO (2011): Study on waste related issues of newly listed POPs and candidate POPs. Available at:<https://ec.europa.eu/environment/waste/studies/pdf/POP_Waste_2010.pdf>. [↑](#footnote-ref-3)
3. Ramboll Environment & Health GmbH (2019): Study to support the Review of Waste Related Issues in Annexes IV and V of Regulation (EC) 850/2004. <https://ec.europa.eu/environment/waste/pdf/Study_POPS_Waste_final.pdf>. [↑](#footnote-ref-4)
4. Tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether, heptabromodiphenyl and decabromodiphenyl ether [↑](#footnote-ref-5)
5. Annex I of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098> [↑](#footnote-ref-6)