



DEC 29 2025

Mr. Michael Chlebowski
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Dear Mr. Chlebowski:

This letter is in response to your Notice of Objection and request to establish a board of review to the publication of the proposed Prohibition of Certain Toxic Substances Regulations, 2022 (proposed Regulations), which was received by Environment and Climate Change Canada on July 12, 2022. The proposed Regulations were published in the *Canada Gazette*, Part I, on May 14, 2022.

I have carefully considered all the issues in your Notice of Objection, including those dealing with the nature and extent of the danger posed by decabromodiphenyl ethane (DBDPE) and the other questions and considerations that you brought to my attention. In my opinion, your Notice of Objection does not raise sufficient uncertainty or doubt in the science underlying the proposed Regulations that would warrant the establishment of a board of review under subsection 333(1) of the *Canadian Environmental Protection Act, 1999*. Therefore, I am denying your request, and I will not establish a board of review. The reasons for my decision are explained below and in the Annex to this letter.

Responses to comments in your Notice of Objection related to the outcomes of the screening assessment for DBDPE, which concluded that there is a risk of harm to the environment due to the persistence and widespread occurrence of DBDPE in the environment along with the potential for bioaccumulation and toxicity of its transformation products, are provided in the Annex.

The comments in your Notice of Objection regarding the development of the proposed Regulations have been considered alongside other comments received on these regulations. The specific points you have raised on the proposed Regulations and how they will be addressed are also summarized in the Annex to this letter. Your Notice of Objection raised specific concerns on the proposed exemptions for DBDPE, and to address these concerns, the proposed timeline of

.../2

the DBDPE exemptions will be extended by an additional 10 years (i.e. extended from 5 years to 15 years for new products and from 20 years to 30 years for replacement parts) and the scope of these exemptions will be broadened to include all manufactured items and additional intermediate materials. This extended timeline will allow all stakeholders additional time for the research and development of alternatives, testing and certification, and transitioning their manufacturing and supply chains. Broadening the scope of the DBDPE exemptions will help to reduce the risk of prohibiting critical components, reduce the need to apply for permits under the proposed Regulations for non-exempted parts, and reduce compliance burden of stakeholders throughout the supply chain.

Please note that the comments on the proposed Regulations will be summarized in the Regulatory Impact Analysis Statement that will be published with the final *Prohibition of Certain Toxic Substances Regulations, 2025* (2025 Regulations) in the *Canada Gazette*, Part II, which describe how these matters have been addressed.

I appreciate your bringing your concerns to my attention. Please accept my best regards.

Yours truly,

A handwritten signature in blue ink, appearing to read "Julie Dabrusin". The signature is fluid and cursive, with the first name "Julie" written in a larger, more prominent script than the last name "Dabrusin".

The Honourable Julie Dabrusin, P.C., M.P.

Att.

Annex

Minister of Environment and Climate Change Canada
Detailed Responses to Notice of Objection Comments

- 1) The following provides a summary of comments related to **“Proposed Risk Management Measures May Lead to Severe Risk to Public Health and Safety”** as set out in your Notice of Objection and the analysis of the information you have provided:

- 1A) In your Notice of Objection, you commented that DBDPE is used as a flame retardant to meet critical flammability standards and safety requirements in products including consumer devices, appliances, airplanes, motor vehicles, and electrical wire and cables used in residential, industrial and utility sectors. In addition, you commented that the unique properties of DBDPE allow for wire and cable manufacturers to meet stringent industry standards.

Flame retardant substances are generally used to meet performance-based flammability requirements. These requirements do not specify what chemical flame retardants need to be used; rather they may require a product or component to pass a laboratory test such as a cigarette smolder or open flame ignition test (ASTM 2014). Using chemical flame retardants such as DBDPE in products is one of the ways by which companies can meet flammability requirements for their products. Alternate substances as well as non-chemical-based alternatives may also be used to replace the use of DBDPE as a flame retardant in various applications.

In addition to the concerns you have raised in your Notice of Objection, a number of similar comments were received during the public comment period for the proposed Regulations. To address these concerns, the proposed timeline of the DBDPE exemptions will be extended by an additional 10 years (i.e. extended from 5 years to 15 years for new products and from 20 years to 30 years for replacement parts) and the scope of the DBDPE exemptions will be broadened to include all manufactured items and additional intermediate materials. This extended timeline will allow all stakeholders additional time for the research and development of alternatives, testing and certification, and transitioning their manufacturing and supply chains. Broadening the scope of the DBDPE exemptions will help to reduce the risk of prohibiting critical components, reduce the need to apply for permits under the Regulations for non-exempted parts, and reduce compliance burden of stakeholders throughout the supply chain.

- 1B) In your Notice of Objection, you provided comments that due to the lack of available alternatives for DBDPE in some products and that without suitable alternatives, increased flammability of products will create health and safety risks and create potential for lowered requirements for approvals of alternatives.

Please refer to the response to point 1A (above) respecting the extended timeline for, and broadened scope of the DBDPE exemptions.

Annex

Minister of Environment and Climate Change Canada
Detailed Responses to Notice of Objection Comments

2) The following provides a summary of comments related to **“Proposed Risk Management Measures for DBDPE are Not Aligned with Other Regulatory Agencies or Agreements”** as provided in your Notice of Objection and the analysis of the information you have provided:

2A) In your Notice of Objection, you noted that the proposed risk management measures as set out in the proposed *Prohibition of Certain Toxic Substances Regulations, 2022* (the “draft Regulation”) for DBDPE are an outlier globally, which includes no prohibition in the United States and that other toxic substances that have been successfully phased out were in alignment with global agreements and regulations.

Canada has been one of the first countries to lead action on flame retardants and was the first country to complete a risk assessment and propose risk management of DBDPE; however, Canada is not alone and since then international action for DBDPE has been underway or has been finalized.

In March 2023, the European Union (EU), under the [European Chemicals Agency \(ECHA\)](#) published their [Regulatory strategy for flame retardants](#), which has a focus on brominated flame retardants and their prioritization for restriction, including DBDPE. This document noted that:

For decabromodiphenyl ethane (EC 284-366-9, DBDPE) data was requested regarding potential bioaccumulation under substance evaluation and has been assessed by the PBT expert group. The available data, including field studies, appear to confirm the Persistent, bioaccumulative and toxic (PBT) properties of the substance.

Furthermore, on October 31, 2024, ECHA updated the [substance evaluation status for DBDPE](#) as ‘Concluded’ and published a [Substance Evaluation Conclusion and Evaluation Report](#) that considers DBDPE to meet the [Regulation on the registration, evaluation, authorisation and restriction of chemicals \(REACH\)](#), Annex XIII very persistent and very bioaccumulative criteria, wide dispersive use and high aggregated tonnage concerns and the need for follow-up regulatory action at the EU level. The report notes the restriction of aromatic brominated flame retardants as proposed in ECHA’s Regulatory strategy for flame retardants appears as a logical continuation following a formal hazard identification as very persistent and very bioaccumulative for DBDPE.

On June 27, 2025, ECHA published a [proposal](#) for identification of DBDPE as a substance of very high concern (SVHC) on the basis of the criteria set out in REACH Article 57. A [REACH Annex XV report](#) was prepared by Sweden to support the proposal for identification of DBDPE as a SVHC.

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

In the United States (US), DBDPE is listed as a new chemical and is subject to a [Significant New Use Rule](#), which requires manufacturers and processors to notify the US [Environmental Protection Agency \(EPA\)](#) before a new use for the manufacture, import or processing of DBDPE begins. In June 2021, the EPA made [DBDPE subject to a Final Health and Safety Data Reporting rule](#) pursuant to the [Toxic Substances Control Act \(TSCA\)](#) as part of a grouping of 30 organohalogen flame retardants being evaluated for risks by the [Consumer Product Safety Commission \(CPSC\)](#). In January 2024, the CPSC published [Organohalogen Flame Retardant Scope Document: Polyhalogenated Benzene Aliphatic and Functionalized Subclass](#) report (the PHBzAF subclass, which includes DBDPE) which concludes that “the PHBzAF subclass has sufficient data to proceed with risk assessment”. Furthermore, DBDPE is restricted in some consumer products under general flame retardant restrictions in some states, such as [California](#), [Maine](#), and [New Hampshire](#).

In August of 2021, Australia published their [assessment of DBDPE](#) and found that DBDPE:

meets the persistence, bioaccumulation, adverse effects in aquatic and terrestrial organisms and long-range transport criteria of Annex D of the Stockholm Convention on Persistent Organic Pollutants. Therefore, on the basis of the current hazard information available, the assessed chemical could pose an unreasonable risk to the environment.

The Australian report also recommended control measures be developed under the [Industrial Chemicals Environmental Management \(Register\) Act 2021](#).

On June 26, 2025, the Australian government finalized its risk management for DBDPE after publishing a statutory public consultation on the proposed risk management for DBDPE in April 2025. The [Industrial Chemicals Environmental Management Standard for decabromodiphenyl ethane \(DBDPE\)](#) is a final scheduling decision to list DBDPE to Schedule 6 of the [Industrial Chemicals Environmental Management \(Register\) Instrument 2022](#). Schedule 6 of this instrument lists “Relevant industrial chemicals that are likely to cause serious or irreversible harm with essential uses” and specifies the risk management measures, including prohibitions and restrictions, that apply to the relevant industrial chemical or a mixture or article containing such a chemical (Australia, 2025).

Canadian risk management for DBDPE takes into consideration actions taken in jurisdictions, including the EU and the US, with the possibility of aligning where appropriate.

Annex

Minister of Environment and Climate Change Canada
Detailed Responses to Notice of Objection Comments

- 2B) In your Notice of Objection, you noted that DBDPE is listed as neither a Persistent Organic Pollutant under the Stockholm Convention, nor a Chemical of Mutual Concern (CMC) under the Canada- U.S. Great Lakes Water Quality Agreement (GLWQA) and that neither rationale justifies the proposed risk management measures.**

The Regulatory Impact Analysis Statement (RIAS) published with the proposed Regulations did not indicate that DBDPE was listed to the Stockholm Convention. The RIAS also noted that not all substances that are prohibited under the current Regulations are listed to the Stockholm Convention. With respect to the GLWQA, the RIAS stated that “the parties have currently designated PFOS, PFOA, LC-PFCAs, HBCD and PBDEs, among other substances, as CMCs”. It was not stated in the RIAS that DBDPE is listed as a CMC under the GLWQA.

Instead, the drivers to regulate DBDPE are the conclusion of the DBDPE screening assessment, and the related risk management objective outlined in the [risk management approach for DBDPE](#): to achieve the lowest level of release of the substance into the Canadian environment, taking into account social, economic and technical matters.

- 2C) In your Notice of Objection, you commented that the U.S.-Mexico-Canada Agreement (USMCA) requires a risk-based approach to chemical regulations and you recommended the removal of DBDPE from the Regulations and that Canada should instead focus on global alignment and obtaining international consensus.**

The [DBDPE screening assessment](#) concludes that DBDPE is toxic, persistent and results predominantly from human activities and that DBDPE is expected to contribute to the formation of persistent, bioaccumulative and inherently toxic transformation products, such as lower brominated diphenyl ethanes, in the environment. As such, at the time the [risk management approach for DBDPE](#) was published, DBDPE met the criteria outlined in the Government of Canada’s Toxic Substances Management Policy for virtual elimination from the environment (Canada, 1995).

Upon the coming into force of the [Strengthening Environmental Protection for a Healthier Canada Act \(S.C. 2023, c. 12\)](#) in June 2023, the virtual elimination provisions of CEPA were replaced with a new regime that remains risk based. In developing a proposed regulation or instrument respecting preventive or control actions in relation to substances added to Part 1 of Schedule 1 of the Act, priority will be given to the total, partial or conditional prohibition of activities in relation to the substance or of releases of the substance into the environment. For substances added to Part 2 of Schedule 1, priority will be given to pollution prevention actions, which may include prohibition, when managing risks posed by those substances.

Annex

Minister of Environment and Climate Change Canada
Detailed Responses to Notice of Objection Comments

An [Order adding DBDPE to Part 2 of Schedule 1 to the Canadian Environmental Protection Act, 1999](#) was published in the *Canada Gazette*, Part II, on February 26, 2025.

As indicated in the risk management approach for DBDPE, the environmental objective for DBDPE is to reduce its concentrations in the Canadian environment to the greatest extent practicable, and the risk management objective for DBDPE is to achieve the lowest level of release of the substance into the Canadian environment, taking into account social, economic and technical matters.

The high importation volumes of DBDPE into Canada, along with information on its uses, indicate potential for widespread release into the Canadian environment. Aquatic exposure to DBDPE is expected through activities such as formulation, either directly to receiving surface water or to a wastewater treatment system that discharges its effluent to a receiving surface water body. In addition, products containing DBDPE have the potential to release DBDPE at various stages of their lifecycle, including use (see house dust studies referred to in Section 10.1.1.2 and Appendix D of the DBDPE screening assessment) and disposal. Once released into the environment, DBDPE will be found mainly in sediment and soil, where it may persist for long periods of time, resulting in DBDPE build-up, as seen by rapid doubling times in sediment in the Great Lakes.

Given the above, a regulatory prohibition is the best approach to meet the risk management objective for DBDPE, which is to achieve the lowest level of release of the substance into the Canadian environment, taking into account social, economic and technical matters.

Furthermore, there is nothing in the 2025 Regulations that contravenes the USMCA Agreement given that the addition of DBDPE to the Regulations reflects a risk-based approach based on the conclusion of the screening assessment of DBDPE.

- 3) The following provides a summary of comments related to **“Proposed Risk Management Measures May Lead to Supply Chain Disruptions”** as provided in your Notice of Objection and the analysis of the information you have provided:

In your Notice of Objection, you provided comments that global product manufacturers take into consideration regulatory, design, and performance requirements which are addressed through a complex global supply chain for components and subcomponents and significant time and costs are associated with switching to alternatives which require research and development, prototyping, performance testing, manufacturing retooling, and regulatory compliance certification. Furthermore, you commented that the prohibition of DBDPE proposed in Canada poses a challenge to global and North American supply chains. You also commented that the prohibition of DBDPE would negatively impact your business and

Annex

Minister of Environment and Climate Change Canada
Detailed Responses to Notice of Objection Comments

that significant time and costs have been invested in switching to DBDPE over the last 20 years which requires research and development, prototyping, performance testing, manufacturing retooling, and regulatory compliance certification and highlighted negative impacts on Canadian manufacturers due to products becoming obsolete and unrecoverable R&D costs.

Please refer to the response to point 1A (above) respecting the extended timeline for, and broadened scope of the DBDPE exemptions.

With respect to the estimated cost for transitioning to alternatives, it is acknowledged that the analysis does not monetize the full impact of the 2025 Regulations due to the limited information available on these substances and their possible alternatives. In response to these comments, a sensitivity analysis was done in the RIAS accompanying the 2025 Regulations to consider higher costs based on available information.

4) The following provides a summary of comments related to “Final Screening Assessment for DBDPE Ignores the Weight of the Evidence” as provided in your Notice of Objection and the analysis of the information you have provided:

4A) In your Notice of Objection, you comment that the conclusion reached in the Final Screening Assessment that DBDPE has the potential to transform into lower brominated products that could pose a risk to aquatic organisms conflicts with the proper application of the weight of evidence approach and has not been substantiated.

The assessment of DBDPE draws on the available empirical, modelling, and scientific information for DBDPE. In the absence of certain data on DBDPE, information on its close analogue, decaBDE was used to evaluate certain properties of DBDPE and its potential to cause adverse effects in the environment including breaking down to lower brominated products. A weight of evidence approach is applied with consideration of multiple lines of evidence, and some uncertainty associated with data gaps in the assessment warranted application of precaution. Thus, weight of evidence, precaution and impact of uncertainty have all been considered in decision-making.

4B) In your Notice of Objection, you commented that it is incorrect in the assessment that decabromodiphenyl ether (decaBDE) is identified as an analogue for decabromodiphenyl ethane (DBDPE).

The use of analogues and read-across in risk assessment, much like decaBDE is used in the [DBDPE screening assessment](#), is well established and internationally recognized.

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

Canada's [approach to the use of analogues and read-across in risk assessment](#)¹ is consistent with OECD Guidance² and the approaches used in other jurisdictions, including by the European Chemicals Agency (ECHA)³.

DecaBDE is considered to be a suitably close analogue for DBDPE given the high degree of structural and functional similarities between the two substances, and the availability of relevant empirical information. In addition to Canada, the United Kingdom (UK) in 2007 and Sweden in 2024 utilized decaBDE as an analogue substance in their respective assessments of the target substance DBDPE⁴.

Structural and functional similarities between substances have typically translated to similarities in environmental fate, behaviour, and other properties. It is noted that some differences in molecular makeup, dimensions, and configurations exist between DBDPE and decaBDE that may affect the manner in which these molecules interact with their environment; however, these differences are well within what is typical for analogue - target differences found in regulatory risk assessments.

The abundance of empirical data on decaBDE also factored into its selection as the most appropriate analogue for DBDPE. Expert judgement is applied in this process, where chemical properties, fate, or behaviour of decaBDE is read-across to DBDPE on a case-by-case (e.g., per endpoint or property) basis rather than in an absolute manner, and by taking into consideration the suitability and comparability of these attributes.

5) The following provides a summary of comments related to *"The Conclusions of the Final Screening Assessment upon which the Proposed Risk Management Measures for DBDPE rely is not Supported by the State of the Science"* as provided in your Notice of Objection and the analysis of the information you have provided:

5A) In your Notice of Objection, you referenced 50 studies provided during the assessment process for DBDPE screening assessment for which you stated the state of the science as demonstrated by these studies does not support a conclusion that would justify the proposed risk management measures.

¹ <https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/analogues-read-across-risk-assessment.html>.

² OECD, *Guidance on Grouping of Chemicals*, 2d ed., 13 April 2017: https://www.oecd.org/en/publications/guidance-on-grouping-of-chemicals-second-edition_9789264274679-en.html.

³ ECHA, Read-Across Assessment Framework (RAAF), 2017: https://echa.europa.eu/documents/10162/17221/raaf_en.pdf/614e5d61-891d-4154-8a47-87efebd1851a.

⁴ [Environmental risk evaluation report: 1,1'-\(Ethane-1,2-diyl\)bis\[penta-bromobenzene\]](#) by United Kingdom Environment Agency (2007) and [Substance Evaluation Conclusion and Evaluation Report for 1,1'-\(ethane-1,2-diyl\)bis\[pentabromobenzene\] \(DBDPE\)](#) by Sweden (2024).

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

All additional experimental studies submitted (including the 50 studies provided during the assessment process), were considered in development of the [DBDPE screening assessment](#) by weighing their reliability and relevance. Those studies that were reliable and relevant to evaluating the risks posed by DBDPE to the environment were included as outlined in the final screening assessment. Thus, the information presented in these 50 studies was either considered in the final screening assessment or has no impact on the regulatory conclusion reached in the final screening assessment for DBDPE.

5B) In your Notice of Objection, you referenced a third-party review in 2020 by Dr. Gobas (the “2020 Gobas Review”), updated in 2022 (the “2022 Updated Gobas Review”), on the available scientific reports relating to DBDPE, as well as the draft and final screening assessments for DBDPE.

You stated that the 2020 Gobas Review concluded that:

- (i) decaBDE is not a good read-across substance for the purpose of estimating the rate of potential debromination of DBDPE;**
- (ii) guidelines and recommendations for applying a read-across approach exist but were not adequately followed by ECCC in the screening assessment; and,**
- (iii) the screening assessment does not include evidence to substantiate that lower-form DBDPE products enter the environment in a quantity or concentration that have or may have an immediate or long-term harmful effect.**

Regarding conclusions i) and ii), please refer to the responses to points 4A and 4B (above).

In response to conclusion iii), ECCC acknowledges that the parent structure DBDPE is highly persistent, highly insoluble in water, and highly sorptive to particulate matter while also having the potential to cause reproductive effects at high concentrations to earthworms as well as effects on plant survival and growth. As a result of these properties, DBDPE will accumulate in the environment and become a significant source of lower brominated transformation products, which have properties that suggest they are more bioaccumulative and hazardous than the parent structure DBDPE itself. Robust modelled aquatic toxicity data for potential DBDPE debrominated transformation products suggest effects at low concentrations in the range of water solubility of these transformation products. In addition, the presence of DBDPE debromination products in wastewater treatment system pond sediments near a DBDPE manufacturing plant in the U.S have been confirmed. Considering DBDPE is a high-volume substance in Canada and that its levels are known to be increasing in the environment (as seen in Great Lakes

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

sediment), and that DBDPE in aqueous solutions or adsorbed to solid surfaces such as sand, sediment, or dust is susceptible to various naturally occurring debromination processes, the pool of potential lower brominated transformation products are environmentally significant. Therefore, it is concluded that DBDPE meets the criteria set out under paragraph 64(a) of CEPA as it is entering or may enter the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity.

5C) In your Notice of Objection, you referenced new information generated since the publication of the screening assessment, a National Academy of Sciences, Engineering, and Medicine report (the “NAS” Report), that suggests that decabromodiphenyl ether (decaBDE) is not an appropriate analogue for decabromodiphenyl ethane (DBDPE).

With regards to comments pertaining to the “NAS” Report, please refer to the responses to point 4B stated previously on the suitability of decaBDE as an analogue for DBDPE.

In addition, the physical-chemical and toxicological information presented in the “NAS” Report suggests that there are substances, other than DBDPE (e.g., pentaBDE and octaBDE), that are more comparable to decaBDE with respect to a particular set of properties considered by NAS, but it does not suggest that DBDPE is incomparable to decaBDE, nor does it suggest that some metabolites formation processes between these two substances are significantly different. It is also worth noting that these subclasses of organic flame retardant substances were developed by NAS for the purposes of assessing risk to human health, and therefore, may not have considered the behaviour of these substances in the environment when forming the subclasses. Thus, the “NAS” Report finding does not directly apply to the use of decaBDE for read-across to DBDPE in the screening assessment.

As mentioned in the response to point 4B (above), it is noted that some differences in molecular makeup, dimensions, and configurations exist between DBDPE and decaBDE that may affect the manner in which these molecules interact with their environment, however, these differences are well within what is typical for analogue – target differences found in regulatory risk assessments as evidenced by three different jurisdictions making this choice (i.e., selecting decaBDE as a suitable analogue for DBDPE) in their 2007 (UK), 2019 (Canada) and 2024 (Sweden) evaluation reports on DBDPE.

5D) In your Notice of Objection, you referenced a new experimental study, 2,000-hour study modelling the photodegradation of DBDPE within high impact polystyrene (HIPS) and polypropylene (PP) in the Canadian environment, not available during the

Annex

Minister of Environment and Climate Change Canada
Detailed Responses to Notice of Objection Comments

assessment process since the publication of the screening assessment which you stated that either does not support the conclusion of the assessment or provides sufficient justification to reconsider its conclusion.

While the applied weathering conditions appear reasonable for simulation of environmental conditions and the quality of the 2,000-hour study was deemed sufficient by a submitted data quality evaluation report, this study represents only one specific type of release scenario with limited relevance to overall DBDPE environmental release and fate. DBDPE has been found in the Canadian environment and around the world. Evidence from studies with DBDPE adsorbed to solid matrices such as soil or sediment are most relevant to the fate of the substance in the natural environment. As an additive brominated flame retardant that is blended with the polymer product (rather than a reactive flame retardant chemical bonded to the polymer product), there is the possibility of release of DBDPE from these products to the environment. In addition, DBDPE may be released to air or dust by volatilization or abrasion of product containing the substance and then deposited to soil or water. Thus, the information presented in this photodegradation study with DBDPE present within a polymer matrix has no impact on the regulatory conclusion reached in the DBDPE screening assessment.

- 6) **The following provides a summary of comments related to “Proposed Risk Management Measures for Polybrominated Diphenyl Ethers (PBDEs) do not Align with Global Regulations and Restrictions” as provided in your Notice of Objection and the analysis of the information you have provided:**

In your Notice of Objection, you commented that the proposed concentration thresholds for incidental presence of PBDEs could put Canada at odds with some of its largest trading partners and consideration should be given to global regulatory alignment.

The incidental presence concentration threshold values in Schedule 3 of the proposed Regulations endeavored to align with those of other jurisdictions. The concentration thresholds for PBDEs (10 mg/kg (0.001 percent by weight) in a product that is a commercial grade substance, mixture, polymer or resin; and 500 mg/kg (0.05 percent by weight) for all other products) are aligned with the concentration thresholds for PBDEs in Annex I of the European Union's [Regulation \(EU\) 2019/1021](#) of 20 June 2019 on persistent organic pollutants (EU's POPs Regulation). However, the EU's POPs Regulation derogates (or exempts) electrical and electronic equipment (EEE) within the scope of the European Union's [Directive 2011/65/EU](#) of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EU RoHS Directive) which has a higher incidental presence concentration threshold of 1,000 mg/kg (0.1 percent by weight) for PBDEs.

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

To support international alignment with the EU RoHS Directive, the proposed incidental presence concentration threshold for PBDEs will be modified to align in specific EEE of 1,000 mg/kg (0.1 percent by weight).

7) The following provides a summary of comments related to “Screening Assessment Criticism: Degradation of DBDPE, real world versus laboratory” as provided in your Notice of Objection and the analysis of the information you have provided:

7A) In your Notice of Objection, you commented that DBDPE only degrades abiotically when it is forced to under the most arbitrary of laboratory conditions and does not readily degrade at all under biotic conditions.

The available empirical evidence presented in the screening assessment illustrates that lower brominated congeners are likely formed from degradation of DBDPE under various environmental conditions and processes which can include biotic and abiotic degradation. Albeit at a low rate, DBDPE was found to undergo biodegradation in activated sludge as well as mixture of pre-exposed sludge and soil. In addition, two nona-bromodiphenyl ethanes (i.e., degradation products of DBDPE) were identified in former wastewater treatment system pond sediments near a DBDPE manufacturing plant in the USA, likely resulting from biodegradation of DBDPE. Regarding abiotic degradation of DBDPE, there is empirical evidence that the substance can potentially generate debromination products (i.e., BDPEs) in water with humic acid under UV light, and ECCC considers the test conditions are of ecological relevance. Thus, DBDPE does not only degrade abiotically when it is forced to under the most arbitrary laboratory conditions and there is also evidence that it may degrade slowly under biotic and other conditions found in the environment as presented in the screening assessment.

8) The following provides a summary of comments related to “Screening Assessment Criticism: DecaBDE as a degradation analogue for DBDPE” as provided in your Notice of Objection and the analysis of the information you have provided:

8A) In your Notice of Objection, you commented why would ECCC defer to a computational model [to predict what transformation products might form] instead of commissioning an analytical study to determine what transformation products actually occur?

The assessment of DBDPE draws on the available empirical, modelling, and scientific information for DBDPE and in absence of certain data on DBDPE, information on its close analogue, decaBDE was used to evaluate the properties of DBDPE and its potential to cause adverse effects in the environment including breaking down to lower brominated products. A weight of evidence approach is applied with consideration of multiple lines of evidence, and some uncertainty associated with data gaps in the

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

assessment warranted consideration of precaution. Thus, the weight of evidence, precaution and impact of uncertainty have all been considered in decision-making.

With regards to the modelling information applied, relevant and well-established models, readily used by other jurisdictions, industry, and academia, were applied. The generated model results were evaluated to ensure reliability in order to inform the assessment and were applied in a weight-of-evidence approach, together with empirical data, an analogue approach, and information submitted by industry, to reduce uncertainties associated with any one line of evidence. Thus, model results are considered a robust and realistic line of evidence and were used in the assessment with consideration of any underlying uncertainties. Based on these aforementioned reasons (i.e., it was not only modelling that was relied on, and modelling was considered reliable), analytical studies to determine what transformation products actually occur were not required. More importantly, it is unlikely such studies could be practically designed to answer this question conclusively.

- 8B) In your Notice of Objection, you commented, Kajiwara et al (2008) performed a real-world assessment of DecaBDE vs DBDPE degradation. They found DecaBDE degrades rapidly even when compounded in HIPS, while after 250 days (6,000 hours) DBDPE in the equivalent compound showed effectively zero degradation.**

It is acknowledged that there are differences in debromination potential between DBDPE and decaBDE under natural sunlight conditions when they are incorporated into high-impact polystyrene (HIPS) and TV casings. It is noted, however, that these matrices reflect one aspect of product lifecycle for DBDPE and thus, these results are weighed accordingly in the assessment. DBDPE releases to the environment are most likely to occur during manufacturing, formulation, or industrial use. Releases to the environment are expected to occur primarily through wastewater, with some release to water directly from industrial sites. Additionally, there are degradation mechanisms other than photolysis in the environment that are of ecological relevance.

- 8C) In your Notice of Objection, you commented that the conclusions from a 2,000 hour study conducted in the Canadian environment was shared with ECCC. It found DBDPE, again, barely degraded when compounded in HIPS and PP. And when it did degrade, the transformation products were identified to be species other than those predicted by the (Q)SAR model.**

Please refer to the responses provided in #5D and #8B. In addition, the degradation products of nonabromodiphenyl ethane isomers identified in the 2,000 hour study were accurately predicted by the (Q)SAR model in the assessment. Although oxyoctabromodiphenyl ethane, instead of octabromodiphenyl ethane isomers, were

Annex

Minister of Environment and Climate Change Canada Detailed Responses to Notice of Objection Comments

identified in the study, it was postulated such a result had little to do with photooxidation or hydrolysis of DBDPE but rather slow nucleophilic substitution of DBDPE with hydroxyl groups of the photooxidized HIPS polymer, which was incomparable to the conditions at which the (Q)SAR model was applied in the assessment.

- 8D) In your Notice of Objection, you commented that when referring to the (Q)SAR model outputs in Appendix C (Table C-1) of the screening assessment, it is wholly unscientific and imprudent to identify a transformation product of DecaBDE, simply replace the 'ether bridge' with an 'ethane bridge', and follow-up with a claim the latter material is a valid degradation product of DBDPE with zero supporting analytical evidence this molecule actually forms.**

Please refer to the responses provided in #7A and #8A. In addition, the purpose of Appendix C in the final screening assessment was to provide a comprehensive side-by-side comparison of lower brominated diphenyl ethanes and lower brominated diphenyl ethers which may be formed from degradation of DBDPE and DecaBDE, respectively and not to simply replace the 'ether bridge' with an 'ethane bridge', and follow-up with a claim the latter material is a valid degradation product of DBDPE. Despite that, two nona-bromodiphenyl ethanes were identified in former wastewater treatment system pond sediments near a DBDPE manufacturing plant in Arkansas, USA, suggesting the degradation products of DBDPE may contain an 'ethane bridge.'

- 9) The following provides a summary of comments related to "DBDPE Fits the Criteria for Continued Use" as provided in your Notice of Objection and the analysis of the information you have provided:**

In your Notice of Objection, you suggest that based on the use profile, physical-chemical properties along with other attributes DBDPE will have a low hazard and exposure potential and is therefore suitable for continued use in Canada.

DBDPE accumulation in the Canadian environment as established in the final screening assessment may present a source for the generation of potentially more bioavailable, bioaccumulative and hazardous transformation products, via degradation under various environmental conditions. DBDPE may also have the potential to accumulate in terrestrial food webs as a result of dietary exposure despite its high hydrophobicity or low water solubility.