Rapid Screening of Substances with Limited General Population Exposure

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Synopsis

On the basis of available information, 171 substances for which potential for direct exposure to humans was not anticipated were identified and were therefore considered to be candidates for a rapid screening approach. These 171 substances met categorization criteria under subsection 73(1) of CEPA or were considered a priority because of other human health or ecological concerns.

For this rapid screening analysis, the approach for the human health component has been updated from past rapid screening approaches to incorporate elements of Health Canada's threshold of toxicological concern (TTC)-based approach. Rather than a volume cut-off based on the commercial status of the substances, a two-fold approach was used to determine exposure for the general population of Canada. The initial screening was based on the potential for direct exposure as outlined in previous rapid screening publications. If no direct exposure was identified, rather than using a volume cut-off based on quantities of the substance in commerce, as in most previous rapid screening approaches, the potential for indirect human exposure from environmental media (e.g., air, water, or soil) was determined using an approach based on Health Canada's TTC approach.

On the basis of this approach, both direct and indirect exposure to the general population of Canada is expected to be negligible for 99 of the 171 substances. Direct and/or indirect exposure potential was identified for the remaining 72 substances, and as a result, these substances will undergo further assessment to evaluate risk to human health.

The ecological risks of 89 of the 99 substances identified in this rapid screening assessment as having negligible exposure to the general population were characterized using the ecological risk classification of organic substances (ERC). The ERC is a risk-based approach that employs multiple metrics for assessing both hazard and exposure on the basis of weighted consideration of various lines of evidence to determine risk classification. Hazard profiles based primarily on metrics regarding mode of toxic action, chemical reactivity, food web-derived internal toxicity thresholds, bioavailability, and chemical and biological activity are established. Metrics considered in the exposure profiles include potential emission rate, overall persistence, and long-range transport potential. A risk matrix is used to assign a low, moderate or high level of potential concern for substances on the basis of their hazard and exposure profiles. Three of the 99 substances have previously been determined not to be of ecological concern through rapid screening evaluations. The ecological risks of seven of the 99 substances remain to be evaluated. As a result of these approaches, 88 of the 99 substances were identified as being of moderate or low ecological concern.

When the results of the human health exposure analysis and the ERC are considered together, 88 of the 99 substances for which human exposure is considered to be negligible were identified as not being of concern to human health or the environment. The remaining 11 substances, although considered to be of low concern to human health, require further assessment because of potential ecological concerns. The results

supporting low risk to human health for these 11 substances may form the basis, in conjunction with other relevant information that becomes available after publication of this document, for conclusions made under section 68 or 74 of CEPA at a later time.

Considering all available lines of evidence presented in this screening assessment, there is low risk of harm to the environment from the 88 substances listed in Appendix B. It is concluded that these 88 substances do not meet the criteria under paragraphs 64(*a*) or (*b*) of CEPA as they are not entering 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 or that constitute or may constitute a danger to the environment on which life depends.

On the basis of the information presented in this screening assessment, it is concluded that these 88 substances do not meet the criteria under paragraph 64(*c*) of CEPA as they are not entering the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health.

Therefore, it is concluded that the 88 substances identified in Appendix B do not meet any of the criteria set out in section 64 of CEPA.

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1. Introduction

On the basis of available information, 171 substances for which potential for direct exposures to humans was not anticipated were identified and were therefore considered to be candidates for a rapid screening approach. Substances that met the above criteria, but that are currently being addressed under other assessment activities, were not included in this rapid screening. The 171 substances met categorization criteria under subsection 73(1) of CEPA or were considered a priority on the basis of other human health or ecological concerns (ECCC, HC [modified 2017]). Unlike most previous rapid screening assessments (e.g., Environment Canada, Health Canada 2014; ECCC, HC 2016), the substances selected as candidates for this initiative were not limited to those reported to be in commerce in Canada at less than or equal to 1000 kg/year; potential for direct human exposure to the substance was the determining factor for consideration.

Seven substances from the Confidential Domestic Substances List (CDSL) were included as a part of the 171 substances in this rapid screening approach. Pursuant to paragraphs 3 to 7 of the *Masked Name Regulations*, a confidential accession number is given to a substance whose identity has been reported as confidential. The identity of the seven substances has been masked in this rapid screening in accordance with sections 88 and 113 of CEPA. Assessments and conclusions pertaining to some of the substances in this rapid screening may be subsequently updated as part of future assessments if the substance is found to be part of a larger class or moiety.

The approach used to determine exposures for the general population of Canada was two-fold. The initial screening was based on the potential for direct exposure using a process consistent with that of previous rapid screenings. Substances reported as having commercial activity in Canada were evaluated on the basis of their presence in several “streams” (e.g., food, non-prescription drugs, natural health products, cosmetics, and other products available to consumers). If no direct exposures were identified, rather than using a volume cut-off based on quantities of the substance in commerce, as in previous rapid screening approaches, the potential for indirect human exposure from environmental media (e.g., air, water, or soil) was determined using an approach based on Health Canada’s threshold of toxicological concern (TTC) approach. Potential releases to the environment were modelled using information on manufacturing and import quantities provided in response to notices regarding commercial activity in Canada collected via mandatory surveys under section 71 of CEPA. For the general population, estimated intakes of less than or equal to 2.5 ng/kg bw/day were considered to be negligible. For the purposes of this assessment, this value is based on the lowest human TTC value for a chemical, below which there is a low probability of risk to human health.

The ecological risks of the majority of substances in this rapid screening were characterized using the ecological risk classification of organic substances (ERC) approach (ECCC 2016a). The ERC describes the hazard of a substance using key metrics including mode of toxic action, chemical reactivity, food web-derived internal

toxicity thresholds, bioavailability, and chemical and biological activity. It considers the possible exposure of organisms in the aquatic and terrestrial environments on the basis of such factors as potential emission rates, overall persistence and long-range transport potential in air. The various lines of evidence are combined to identify substances warranting further evaluation of their potential to cause harm to the environment or as having a low likelihood of causing harm to the environment.

This rapid screening was prepared by staff in the CEPA Risk Assessment Program at Health Canada and Environment and Climate Change Canada and incorporates input from other programs within these departments. The ERC document was subject to an external peer-review and a 60-day public comment period. While external comments were taken into consideration, the final content and outcome of the screening assessment remain the responsibility of Environment and Climate Change Canada and Health Canada.

This rapid screening focuses on scientific information critical to determining whether substances meet the criteria as set out in section 64 of CEPA and incorporates a weight-of-evidence approach and precaution.[1] The rapid screening presents the critical information and considerations on which the conclusions are based.

[1]A determination of whether one or more of the criteria of section 64 of CEPA are met is based upon an assessment of potential risks to the environment and/or to human health associated with exposures in the general environment. For humans, this includes, but is not limited to, exposures from ambient and indoor air, drinking water, foodstuffs, and products available to consumers. A conclusion under CEPA is not relevant to, nor does it preclude, an assessment against the hazard criteria specified in the *Hazardous Products Regulations*, which are part of the regulatory framework for the Workplace Hazardous Materials Information System for products intended for workplace use. Similarly, a conclusion based on the criteria contained in section 64 of CEPA does not preclude actions being taken under other sections of CEPA or other acts.

2. Approach

2.1 Overall approach for evaluation of exposure to the general population

The human health component of this rapid screening approach is illustrated in Figure 1. It consists of multiple steps that address the potential for exposure to a substance.

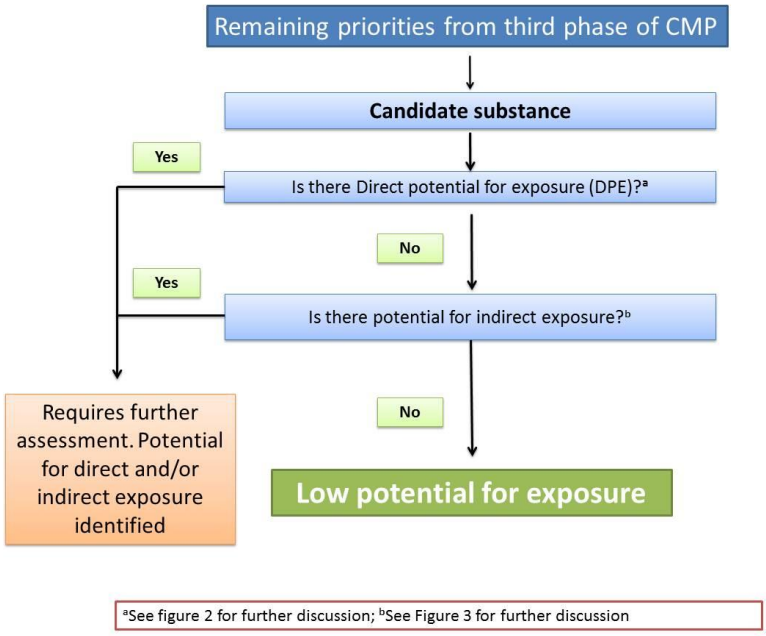

Figure 1. Overview of approach for evaluation of indirect and direct exposures to the general population

Long form description: Candidate substances were identified from the remaining priorities from the 3rd phase of the Chemicals Management Plan. The first step was to determine if a candidate substance a potential for direct exposure. If yes, then the substance is no longer considered within this rapid screening approach and requires further assessment. If no, then the candidate substance proceeds to the second step in the approach and the potential for indirect exposure is evaluated. If a potential for indirect exposure is identified then the substance is removed from the approach, and requires further assessment. If no potential for low exposure is identified, then the candidate substance is considered within this approach to have a low potential for exposure.

Figure 1 illustrates the human health component of this rapid screening approach. The potential for direct exposure of a candidate substance is evaluated as the first step. If

potential for direct exposure to the general population is identified, the substance requires further assessment and is subsequently removed from further consideration in the rapid screening approach. If potential for direct exposure is not identified, an additional step to evaluate the potential for indirect exposure to the general population is conducted. The results of this second step determine whether or not the substance requires further assessment or can be considered to represent a negligible risk for exposure to the general population.

The approach used in this rapid screening is similar to that of previous rapid screenings (e.g., Environment Canada, Health Canada 2014; ECCC, HC 2016). However, in most previous rapid screening approaches, the candidate substances were typically identified on the basis of their low potential for indirect exposure at the outset (i.e., reported quantities in Canadian commerce not exceeding 1000 kg/year). The scope of those screening assessments was therefore limited to evaluation of the potential for direct exposure. The scope of this rapid screening was broadened and updated to reflect and utilize elements of the TTC approach. For example, if no direct exposure was identified, rather than using a volume cut-off based on quantities of the substance in commerce, as in previous rapid screening approaches, the potential for indirect human exposure from environmental media (e.g., air, water, or soil) was determined using an approach based on the TTC approach.

2.2 Process for evaluating the potential for direct exposure of the general population

In this rapid screening, the term “direct exposure” refers to a substance that is available to Canadians for their use either directly or as part of a mixture, product, or manufactured item. In this context, direct use does not include exposures from chemical products used by workers in an industrial or workplace setting. A user is considered to be anyone from the general population who has access to a product that is advertised, imported, or sold in Canada (including those marketed and sold online in Canada). Considerations for determination of direct exposure potential are described below and outlined in Figure 2.

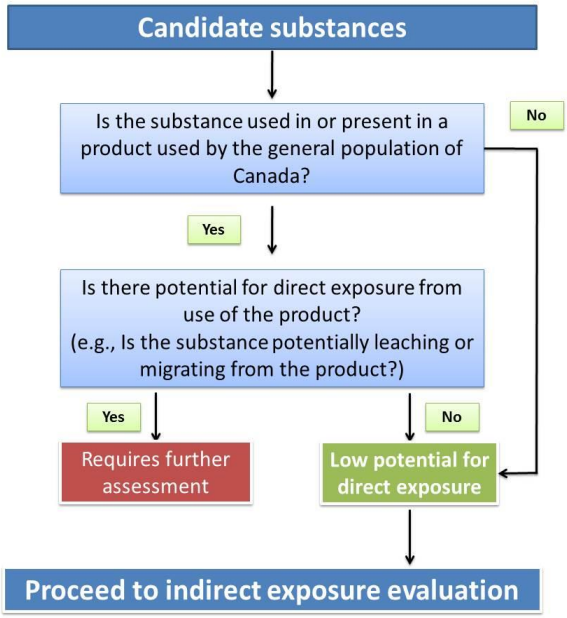

Figure 2. Considerations for the determination of potential for direct exposure to the general population

Long form description: Candidate substances are evaluated for the potential for direct exposure by first identifying if the substance is used in or present in a product used by the general population of Canada. If the substance is not found to used in or present in a product used by the general population of Canada then it is determined to have a low potential for direct exposure and moves on to further evaluation of the potential for indirect exposure. If the substance was found to be used in or present in a product it proceeds to a further evaluation to determine if there is potential for direct exposure from use of the product. If yes, then the substance is no longer considered within this approach and requires further assessment. If no, then the substance is considered to have a low potential for direct exposure and proceeds to indirect exposure evaluation.

Figure 2 illustrates the process for determining the potential for direct exposure of the general population of Canada. In some cases, the process requires two steps for direct use determination. To determine if a substance is used or present in a product used by Canadians, numerous sources of both domestic and international use and product information were consulted, including but not limited to:

Domestic

- Information from a mandatory section 71 survey under CEPA - Notice with respect to selected substances identified as priority for action (Canada 2006)
- Information from a mandatory section 71 survey under CEPA - Phase One of the Domestic Substances List (DSL) Inventory Update (DSL IU) (Canada 2009)
- Information from a mandatory section 71 survey under CEPA - Phase Two of the DSL IU (Canada 2012)
- Health Canada's Lists of Permitted Food Additives (Health Canada [modified 2016])
- Health Canada's Natural Health Products Ingredients Database (NHPID 2016)
- Health Canada's Licensed Natural Health Products Database (LNHPD 2016)
- Health Canada's Drug Product Database (DPD 2016)
- Pest Management Regulatory Agency's Product Information Database (PMRA 2016)
- Pest Management Regulatory Agency's List of Formulants (PMRA 2010)
- List of Pharmaceuticals sold in Canada (Health Canada 2011 & 2012) (IMS 2013)
- Notifications submitted under the *Cosmetic Regulations* to Health Canada
- Notifications submitted under the *Food and Drugs Act* to Health Canada

International

- United States Environmental Protection Agency's (US EPA) Chemical and Product Categories Database (CPCat 2016)
- Everything Added to Food in the United States Database (EAFUS 2011)
- United States Food and Drug Administration's Food Additive Status List (US FDA 2013)
- United States Food and Drug Administration's List of Indirect Additives used in Food Contact Substances (US FDA 2011)
- European Commission's Food Additive Database (EU 2014a)
- European Commission's Food Flavourings Database (EU 2014b)
- European Commission's Cosmetic Ingredient Database (COSING 2014)
- Household Products Database (HPD 2016)
- Hazardous Substances Data Bank (HSDB c1993-2008)
- Danish Surveys on Chemicals in Consumer Products - various (Denmark 2016)
- Material safety data sheets (MSDS) - various internet sources
- National and international assessments and databases

If there is identified or expected use of a candidate substance, or if the substance is found in a product used by Canadians, a subsequent step is required to determine the potential for direct exposure from use of the product. The following considerations were used to determine potential for direct exposure:

1. Substances for which direct exposures of the general population are not expected include, but are not limited to, those used only:
    - as intermediates in the manufacturing process;
    - for commercial or industrial use; or
    - for research purposes.

2. Substances with potential for direct exposure of the general population include those that are present, either intentionally or unintentionally, in products or manufactured items that are commonly used by Canadians. These include, but are not limited to, substances used in:

    - products intended for use by children, and manufactured items such as plastic or wooden toys;
    - cosmetics, non-prescription drugs and natural health products;
    - commercial paints and inks;
    - commercial adhesives;
    - hobby activities or do-it-yourself products;
    - clothing, fabric and other textiles, including bedding and furniture;
    - cleaning products; and
    - food additives and packaging.

3. Information on the potential of the substance to migrate from products is also considered, including the type of product that the substance is present in, the substance's functional use in that product, as well as the substance's physical-chemical properties. For example, direct exposure would not be expected to occur for a substance used as a curing agent in a polymer as the substance would be reacted into the stable matrices of the cured polymer and would therefore not typically be available for migration. If this information is not known for a substance, it is assumed that the substance may be migrating out of the final product, which may lead to direct exposure for users.

If there is no evidence for use of a substance in a product used by Canadians, the substance is determined to have a low potential for direct exposure, and its potential for indirect exposure is then considered.

2.3 Process for evaluating the potential for indirect exposure of the general population

In most previous rapid screenings (e.g., Environment Canada, Health Canada 2014; ECCC, HC 2016), the cut-off for inclusion of a candidate substance was based on reported quantities in commerce in Canada that were less than or equal to 1000 kg/year per substance. However, for this rapid screening, no quantity cut-off value was used, and the scope of this rapid screening was broadened and updated to reflect and utilize elements of the TTC approach. For example, if no direct exposure was identified, rather than using a volume cut-off based on quantities of the substance in commerce, as in previous rapid screening approaches, the potential for indirect human exposure from

environmental media (e.g., air, water, or soil) was determined using an approach consistent with that reported in Health Canada's Threshold of Toxicological Concern (TTC)-based Approach for Certain Substances (Health Canada 2016). As a result, some substances included in this rapid screening approach may result in some level of indirect exposure from environmental media. The general scheme for evaluating the potential for indirect exposure of the general population in Canada is shown in Figure 3.

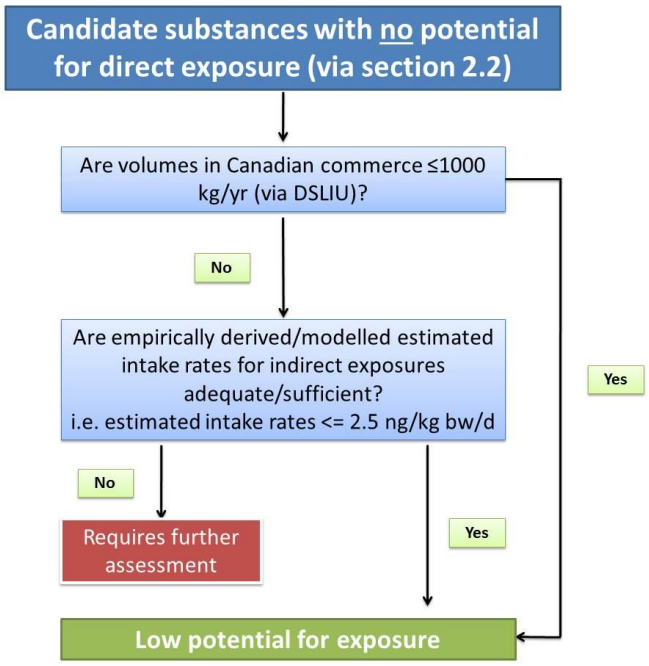

Figure 3. Considerations for the determination of potential for indirect exposure to the general population

Long form description: Candidates identified as not having a potential for direct exposure in this approach proceed to an evaluation of the potential for indirect exposure. At the first step, if the candidate substance was notified via the DSL IU with volumes in Canadian commerce greater than or equal to 1000 kg/yr then it is considered to have a low potential for indirect exposure. If the volumes are >1000 kg/yr then a further step is involved to derive intake rates for indirect exposures. If the intake rates are determined to be less than or equal to 2.5 ng/kg body weight/day, then the substance is considered to have a low potential for indirect exposure. If the intake rates are > 2.5 ng/kg body weight/day, then the substance is no longer considered within this approach and requires further assessment.

Figure 3 illustrates the process for determining the potential for indirect exposure of the general population. The initial step for candidate substances in this rapid screening approach considers the total volumes reported in Canadian commerce via mandatory surveys. This was based on information provided in response to notices regarding commercial activity in Canada collected from both Phase One and Phase Two of the DSL IU (Canada 2009, Canada 2012) and a survey conducted in 2006 (Canada 2006) under section 71 of CEPA.

As with most previous rapid screening approaches, substances reported at less than or equal to 1000 kg/year were considered to represent a low potential for exposure of the general population via indirect sources (Environment Canada, HealthCanada 2014; ECCC, HC 2016). For substances that were reported at volumes greater than 1000 kg/year, an additional step was undertaken to determine the estimated intake rates from indirect exposure. This evaluation step was adopted from the approach described in Health Canada 2016.

Briefly, the approach relied on empirical or modelled physical-chemical properties and environmental degradation half-lives of substances obtained using EPI Suite (EPI Suite 2012). Data and results obtained from EPI Suite, along with Canadian manufacturing and import data (Canada 2006, Canada 2009, Canada 2012), were then entered into the environmental fugacity model, ChemCAN (ChemCAN 2003) to estimate environmental concentrations for each substance. As a conservative approach, emission volumes modelled in ChemCAN were based on the total volumes reported to be manufactured and imported in Canada (i.e., assuming 100% of the substance manufactured or imported into Canada is released to the environment).

As required, modelling was refined by considering wastewater treatment (WWT) removal rates estimated using SimpleTreat (Struijs et al. 1991) and the STP model in EPI Suite (EPI Suite 2012). The lower of the two removal rates generated by the two models for a substance was applied to reduce the initial emission volume used for the ChemCAN modelling.

If a substance was not a suitable candidate for fugacity modelling because of its physical-chemical properties (e.g., vapour pressure less than 10^{-7} Pa or water solubility less than 1 ng/L), theoretical environmental intake estimates were generated. See Health Canada 2016 for a detailed discussion regarding the assessment of indirect exposure for substances not amenable to fugacity modelling.

The estimated environmental concentrations were used to derive human intake values to estimate indirect exposure of the general population to each substance on the basis of Canadian exposure factors (Health Canada 1998). Empirical Canadian monitoring or emissions release data were used, when available, provided the empirically-based predicted environmental concentrations exceeded the environmental concentration estimates derived from in-commerce quantities.

The approach used to estimate indirect exposure is considered conservative as it assumes (1) an emission factor of 100%, (2) a worst-case mode-of-entry into the environment, and (3) all releases as occurring in only one region of Canada. For the purposes of this assessment, human exposure is considered to be negligible for all substances having predicted indirect exposures of 2.5 ng/kg bw/d or less.[2]

2.4 Ecological approach

The ecological risks of the majority of substances in this rapid screening were characterized using the ERC approach (ECCC 2016a). The ERC is a risk-based approach that considers multiple metrics for assessing both hazard and exposure, with weighted consideration of multiple lines of evidence for determining risk classification. The various lines of evidence are combined to discriminate between substances of lower or higher potency and lower or higher potential for exposure in various media. This approach reduces the overall uncertainty with risk characterization compared to an approach that relies on a single metric in a single medium (e.g., LC_{50}) for characterization. Since several substances are UVCB (unknown or variable composition, complex reaction products, or biological materials) substances and could not be suitably represented by a single chemical structure, a manual judgement-based approach to classification was used. The following paragraphs in this section summarize the approach, which is described in detail in ECCC (2016a).

Data on physical-chemical properties, fate (chemical half-lives in various media and biota, partition coefficients, and fish bioconcentration), acute fish ecotoxicity, and chemical import or manufacture volume in Canada were collected from scientific literature, from available empirical databases (e.g., OECD QSAR Toolbox), and from responses to surveys under section 71 of CEPA or were generated using selected quantitative structure-activity relationship (QSAR) or mass-balance fate and bioaccumulation models. These data were used as inputs to other mass-balance models or to complete the substance hazard and exposure profiles.

Hazard profiles based primarily on metrics regarding mode of toxic action, chemical reactivity, food web-derived internal toxicity thresholds, bioavailability, and chemical and biological activity were established. Exposure profiles were also composed using multiple metrics including potential emission rate, overall persistence, and long-range transport potential. Hazard and exposure profiles were compared to decision criteria in order to classify the hazard and exposure potentials for each organic substance as low, moderate, or high. Additional rules were applied (e.g., classification consistency, margin

[2] The threshold of toxicological concern, 2.5 ng/kg bw/d, represents the lowest human exposure threshold value for a chemical, below which there is a low probability of risk to human health (Blackburn et al. 2005, EFSA 2012, EFSA/WHO 2016, Feigenbaum et al. 2015, Kalkhof et al. 2011, Kroes et al. 2004, Lauferswеiler 2012, Pinalli et al. 2011, Tluczkiewicz et al. 2011).

of exposure) to refine the preliminary classifications of hazard or exposure. However, in the case of the UVCBs, hazard and exposure could not be fully profiled because of the lack of a representative structure to estimate needed properties and the lack of empirical data for these properties. Therefore, manual classification of hazard and exposure was performed through examination of the UVCB constituents and information obtained from section 71 surveys under CEPA and decisions were based on consideration of similar substances and application of expert judgement.

A risk matrix was used to assign a low, moderate or high classification of potential risk for each substance on the basis of its hazard and exposure classifications. ERC classifications of potential risk were verified using a two-step approach. The first step adjusted the risk classification outcomes from moderate or high to low for substances that had a low estimated rate of emission to water after wastewater treatment, representing a low potential for exposure. The second step reviewed low risk potential classification outcomes using relatively conservative, local-scale (i.e., in the area immediately surrounding a point-source of discharge) risk scenarios designed to be protective of the environment to determine whether the classification of potential risk should be increased.

3. Rapid screening results

3.1 Assessment of the potential to cause harm to human health

Figure 4 illustrates the results of the evaluation of direct and indirect exposure of the general population for the candidate substances, with an accompanying number of substances associated with each step of the process.

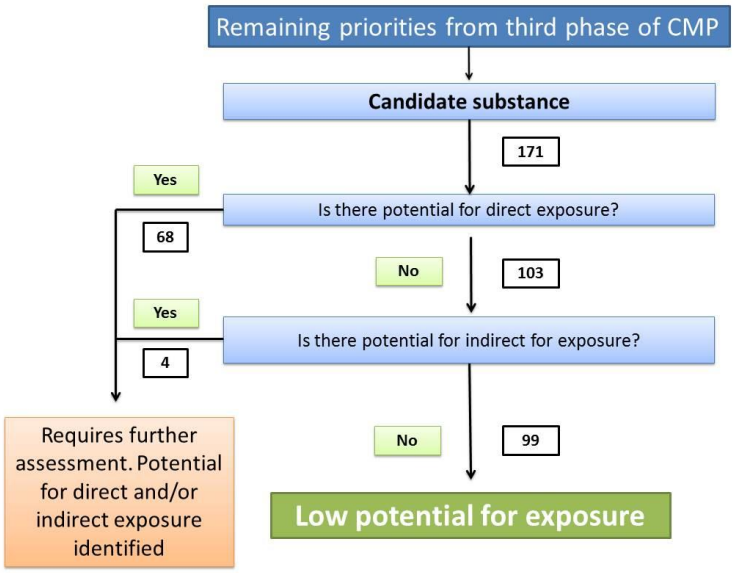

Figure 4. Results of the evaluation of direct and indirect exposure to the general population

Long form description: The rapid screening approach identified 171 candidates. At the first step in the evaluation of the potential to cause harm to human health the potential for direct exposure is determined. There was no potential for direct exposure identified for 103 of the 171 candidates. The potential for indirect exposure was then evaluated for these 103 substances. As a result of the approach applied in this assessment, a further 4 substances had a potential for indirect exposure identified. The remaining 99 substances were then determined to have a low potential for exposure after applying the rapid screening approach utilized in this assessment.

As a result of this exposure characterization, 68 of the 171 substances were identified as having the potential to result in direct exposure of the general population, and so further assessment of these substances is required. Four of the remaining 103 substances had predicted indirect exposure estimates higher than the TTC value (i.e., 2.5 ng/kg bw/day). Therefore, 72 substances in total will undergo further human health assessment in future publications (see Appendix A).

On the basis of the evaluation of both direct and indirect exposure conducted as part of this rapid screening approach, exposure of the general population was considered to be negligible for the remaining 99 substances.

3.2 Assessment of the potential to cause ecological harm

The ecological risks of 89 of the 99 substances that were determined to have negligible exposure to the general population in this rapid screening were characterized using the ERC approach. Three additional substances were previously determined not to be of ecological concern through rapid screening evaluations (Environment Canada, Health Canada 2014; ECCC, HC 2016). As a result of this approach, 88 substances were identified as being of moderate or low ecological concern. The critical data and considerations used to create substance-specific profiles and classifications associated with ecological hazard, exposure and risk, as well as identification of potential need for tracking of future use patterns, are presented in ECCC (2016b).

A summary of the hazard, exposure and risk classifications can be found in Appendix B.

3.3 Determination of substances of low concern for guman gealth and the environment

Figure 5 illustrates the combined results of the assessment to cause harm to human health, as determined via the potential for direct and indirect exposure of the general population, and the assessment to cause ecological harm, as determined via the ERC approach.

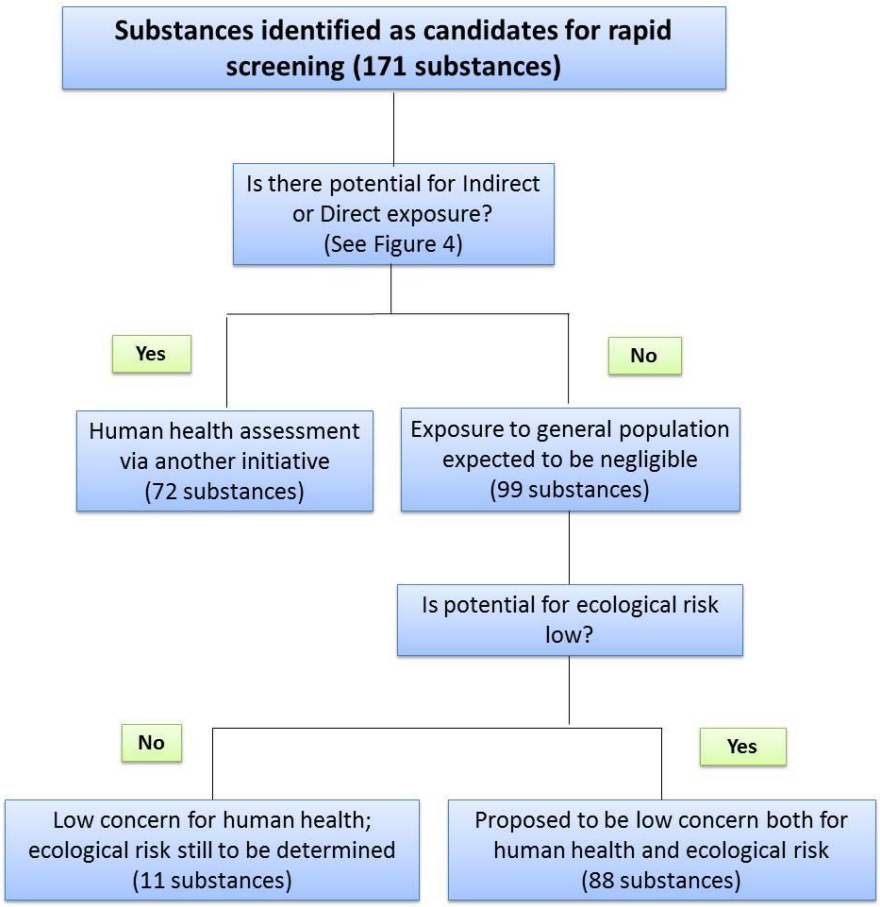

Figure 5. Determining substances of low concern for human health and ecological risk

Long form description: Figure 5 illustrates the flow through of decisions after applying the rapid screening approach developed for identifying the potential to cause harm to human health utilized in this assessment, as well as the alignment with the results of this evaluation with the results of ecological risk classification (ERC) of organic substances approach. After evaluating the potential for direct and/or indirect exposure of the 171 candidate substances, 72 were found to require further human health assessment via another initiative, and 99 were determined to have negligible potential exposure to the general population. These 99 substances were then cross-referenced with the substances found to have low potential for ecological risk, as determined by the ERC approach. As a consequence, 88 substance were found to have both low concern for human health and risk assessment. The remaining 11 substances, while having a low concern for human health, have the potential for ecological risk still to be determined.

From the subset of 99 substances for which exposure of the general population was considered to be negligible, 88 substances were also identified as having low potential to pose ecological risk (ECCC 2016b) (see Appendix B). The remaining 11 substances were found to be of low concern to human health, but were identified as requiring further assessment because of potential ecological concerns (see Appendix C). The results supporting low risk to human health for these 11 substances may form the basis, in conjunction with other relevant information that becomes available after publication of this document, for conclusions made under section 68 or 74 of CEPA at a later time.

Although the above-mentioned 88 substances were determined to be of low risk for the environment and human health, several of these substances are associated with health and/or possible ecological effects of concern because of inherent hazard (see Appendix D). Substances associated with health effects of concern were identified on the basis of classifications assigned by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity or reproductive toxicity. While use patterns and quantities dictate that these substances are not currently of concern, given the associated human health effects, there may be a concern for human health if use patterns were to change or quantities were to increase.

Substances associated with ecological effects of concern include those that are potential DNA and/or RNA binders, potential endocrine disrupting chemicals which target estrogen receptor signalling, possible substitutes for a substance in a high concern ERC group, moderate concern substances not associated with a high concern ERC group, substances having greater potential for local-scale exposures, or substances having high hazard but low current exposure according to ERC results. The potential effects and how they may manifest in the environment were not further investigated due to the low overall exposure to these substances.

4. Summary of uncertainties

It is recognized that the conclusions resulting from the use of this rapid screening approach have associated uncertainties. However, the use of a wide range of filters (e.g., the domestic and international sources listed in Section 2.2) and conservative exposure scenarios gives confidence that the substances identified as not requiring further assessment are unlikely to be of concern.

Modelled data for physical-chemical properties, environmental degradation half-lives, wastewater treatment removal rates, and environmental concentrations were used in the estimation of indirect exposure when empirical data was unavailable. Despite uncertainty associated with modelled data, the assumptions and inputs used to estimate indirect exposure are likely to lead to an overestimation. The uncertainties associated with determining the potential for indirect exposure of the general population are outlined in Health Canada’s Threshold of Toxicological Concern (TTC)-based Approach for Certain Substances (Health Canada 2016).

The ERC uses a weighted approach to minimize the potential for both over- and under-classification of hazard, exposure and subsequent risk. The balanced approaches for dealing with uncertainties are described in greater detail in ECCC 2016a.

5. Conclusion

On the basis of the information presented in this screening assessment, it is concluded that the 88 substances identified in Appendix B are not entering 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, that constitute or may constitute a danger to the environment on which life depends, or that constitute or may constitute a danger in Canada to human life or health.

Therefore, it is concluded that the 88 substances identified in Appendix B do not meet any of the criteria set out in section 64 of CEPA.

6. References

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Appendices

Appendix A. Substances requiring further assessment based on potential for exposure of the general population

CAS RN	Chemical Name	Potential exposure identified
57-97-6	Benz[*a*]anthracene, 7,12-dimethyl-	Direct
59-50-7	Phenol, 4-chloro-3-methyl-	Direct
61-82-5	1*H*-1,2,4-Triazol-3-amine	Direct
68-26-8	Retinol	Direct
75-05-8	Acetonitrile	Indirect
75-18-3	Methane, thiobis-	Direct
77-09-8	1(3*H*)-Isobenzofuranone, 3,3-bis(4-hydroxyphenyl)-	Direct
81-15-2	Benzene, 1-(1,1-dimethylethyl)-3,5-dimethyl-2,4,6-trinitro-	Direct
86-30-6	Benzenamine, *N*-nitroso-*N*-phenyl-	Direct
88-19-7	Benzenesulfonamide, 2-methyl-	Direct
95-55-6	Phenol, 2-amino-	Direct
101-84-8	Benzene, 1,1'-oxybis-	Direct
101-96-2	1,4-Benzenediamine, *N*,*N*'-bis(1-methylpropyl)-	Direct
106-92-3	Oxirane, [(2-propenyloxy)methyl]-	Direct
110-85-0	Piperazine	Direct
111-82-0	Dodecanoic acid, methyl ester	Direct
112-05-0	Nonanoic acid	Direct
112-69-6	1-*H*exadecanamine, *N*,*N*-dimethyl-	Direct
120-78-5	Benzothiazole, 2,2'-dithiobis-	Indirect
123-77-3	Diazenedicarboxamide	Direct
124-40-3	Methanamine, *N*-methyl-	Direct
132-27-4	[1,1'-Biphenyl]-2-ol, sodium salt	Direct
136-60-7	Benzoic acid, butyl ester	Direct
137-26-8	Thioperoxydicarbonic diamide ($[(H_2N)C(S)]_2S_2$), tetramethyl-	Direct
2390-60-5	Ethanaminium, *N*-[4-[[4-(diethylamino)phenyl][4-(ethylamino)-1-naphthalenyl]methylene]-2,5-cyclohexadien-1-ylidene]-*N*-ethyl-, chloride	Direct
2492-26-4	2(3*H*)-Benzothiazolethione, sodium salt	Direct
3147-75-9	Phenol, 2-(2*H*-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)-	Direct
4193-55-9	Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[[4-[bis(2-hydroxyethyl)amino]-6-(phenylamino)-1,3,5-triazin-2-yl]amino]-, disodium salt	Direct
4572-09-2	Olean-12-en-29-oic acid, 3-hydroxy-11-oxo-, (3β,20β)-, compd. with (2,5-dioxo-4-imidazolidinyl)urea (1:1)	Direct
6408-72-6	9,10-Anthracenedione, 1,4-diamino-2,3-diphenoxy-	Direct
7778-54-3[a]	Hypochlorous acid, calcium salt	Direct
7789-38-0[a]	Bromic acid, sodium salt	Direct
8005-03-6	C.I. Acid Black 2	Direct
8008-57-9	Oils, orange, sweet	Direct

9007-13-0	Resin acids and Rosin acids, calcium salts	Direct
10038-98-9[a]	Germane, tetrachloro-	Indirect
11103-57-4	Vitamin A	Direct
12136-45-7[a]	Potassium oxide (K_2O)	Direct
15647-08-2	Phosphorous acid, 2-ethylhexyl diphenyl ester	Direct
16090-02-1	Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[[4-(4-morpholinyl)-6-(phenylamino)-1,3,5-triazin-2-yl]amino]-, disodium salt	Direct
25155-23-1	Phenol, dimethyl-, phosphate (3:1)	Direct
25167-32-2	Benzenesulfonic acid, oxybis[dodecyl-, disodium salt	Direct
26264-05-1	Benzenesulfonic acid, dodecyl-, compd. with 2-propanamine (1:1)	Direct
26694-69-9	Xanthylium, 9-[2-(ethoxycarbonyl)phenyl]-3,6-bis(ethylamino)-2,7-dimethyl-, ethyl sulfate	Direct
28519-02-0	Benzenesulfonic acid, dodecyl(sulfophenoxy)-, disodium salt	Direct
37310-83-1	9-Octadecen-1-ol, (*Z*)-, phosphate	Direct
57855-77-3	Naphthalenesulfonic acid, dinonyl-, calcium salt	Direct
58713-21-6	1,3,5,7-Tetraazatricyclo[3.3.1.13,7]decane, hydrochloride	Direct
61788-44-1	Phenol, styrenated	Direct
61790-44-1	Fatty acids, tall-oil, potassium salts	Direct
61791-34-2	Onium compounds, morpholinium, 4-ethyl-4-soya alkyl, Et sulfates	Direct
68122-86-1	Imidazolium compounds, 4,5-dihydro-1-methyl-2-nortallow alkyl-1-(2-tallow amidoethyl), Me sulfates	Direct
68153-35-5	Ethanaminium, 2-amino-*N*-(2-aminoethyl)-N-(2-hydroxyethyl)-*N*-methyl-, *N*,*N*'-ditallow acyl derivs., Me sulfates (salts)	Direct
68186-14-1	Resin acids and Rosin acids, Me esters	Direct
68308-67-8	Quaternary ammonium compounds, ethyldimethylsoya alkyl, Et sulfates	Direct
68391-01-5	Quaternary ammonium compounds, benzyl-C12-18-alkyldimethyl, chlorides	Direct
68411-30-3	Benzenesulfonic acid, C_{10-13}-alkyl derivs., sodium salts	Direct
68442-97-7	1*H*-Imidazole-1-ethanamine, 4,5-dihydro-, 2-nortall-oil alkyl derivs.	Indirect
68476-03-9	Fatty acids, montan-wax	Direct
68511-50-2	1-Propene, 2-methyl-, sulfurized	Direct
68584-24-7	Benzenesulfonic acid, C_{10-16}-alkyl derivs., compds. with 2-propanamine	Direct
68649-12-7	1-Decene, tetramer, mixed with 1-decene trimer, hydrogenated	Direct
68909-20-6	Silanamine, 1,1,1-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica	Direct
68937-41-7	Phenol, isopropylated, phosphate (3:1)	Direct
68966-38-1	1*H*-Imidazole-1-ethanol, 4,5-dihydro-2-isoheptadecyl-	Direct
68990-53-4	Glycerides, C_{14-22} mono-	Direct
70321-86-7	Phenol, 2-(2*H*-benzotriazol-2-yl)-4,6-bis(1-methyl-1-phenylethyl)-	Direct

71011-26-2	Quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides, compds. with hectorite	Direct
72391-24-3	Benzenesulfonic acid, [[(chloroacetyl)amino]methyl][4-[[4-(cyclohexylamino)-9,10-dihydro-9,10-dioxo-1-anthracenyl]amino]phenoxy]methyl-, monosodium salt	Direct
92113-31-0	Collagens, hydrolyzates	Direct
111174-63-1	Protein hydrolyzates, leather, reaction products with isostearoyl chloride	Direct
120547-52-6	Oxirane, mono[(C_{12-13}-alkyloxy)methyl] derivs.	Direct

[a]Ecological risk of substance to be evaluated

Appendix B. Substances with low potential for exposure of the general population and low ecological concern

CAS RN/ Confidential Ascension Number	Chemical Name	ERC hazard	ERC exposure	ERC risk
74-88-4	Methane, iodo-	high	low	low[a]
78-21-7	Morpholinium, 4-ethyl-4-hexadecyl-, ethyl sulfate	moderate	low	low
90-93-7	Methanone, bis[4-(diethylamino)phenyl]-	high	low	low[a]
91-66-7[b]	Benzenamine, *N*,*N*-diethyl-	low	low	low
95-54-5	1,2-Benzenediamine	high	low	low[a]
98-88-4	Benzoyl chloride	moderate	low	low
100-00-5[b]	Benzene, 1-chloro-4-nitro-	low	low	low
101-90-6[b]	Oxirane, 2,2'-[1,3-phenylenebis(oxymethylene)]bis-	moderate	low	low
112-90-3	9-Octadecen-1-amine, (*Z*)-	high	low	low[a]
118-96-7	Benzene, 2-methyl-1,3,5-trinitro-	moderate	moderate	moderate
121-14-2[b]	Benzene, 1-methyl-2,4-dinitro-	moderate	moderate	moderate
126-99-8[b]	1,3-Butadiene, 2-chloro-	low	low	low
134-09-8	Cyclohexanol, 5-methyl-2-(1-methylethyl)-, 2-aminobenzoate	low	low	low
271-89-6[b]	Benzofuran	low	low	low
556-52-5[b]	Oxiranemethanol	low	low	low
630-20-6[b]	Ethane, 1,1,1,2-tetrachloro-	low	low	low
632-99-5[b]	Benzenamine, 4-[(4-aminophenyl)(4-imino-2,5-cyclohexadien-1-ylidene)methyl]-2-methyl-, monohydrochloride	low	low	low
647-42-7	1-Octanol, 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluoro-	low	low	low
1533-45-5	Benzoxazole, 2,2'-(1,2-ethenediyldi-4,1-phenylene)bis-	high	low	low[a]
2387-03-3	1-Naphthalenecarboxaldehyde, 2-hydroxy-, [(2-hydroxy-1-naphthalenyl)methylene]hydrazone	high	low	low[a]
2422-91-5	Benzene, 1,1',1''-methylidynetris[4-isocyanato-	high	low	low[a]
2475-45-8[b]	9,10-Anthracenedione, 1,4,5,8-tetraamino-	high	low	low[a]
2478-20-8	1*H*-Benz[de]isoquinoline-1,3(2*H*)-dione, 6-amino-2-(2,4-dimethylphenyl)-	low	low	low
3426-43-5	Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[[4-methoxy-6-(phenylamino)-1,3,5-triazin-2-yl]amino]-, disodium salt	high	low	low[a]
4035-89-6	Imidodicarbonic diamide, *N*,*N*',2-tris(6-isocyanatohexyl)-	high	low	low[a]
4051-63-2	[1,1'-Bianthracene]-9,9',10,10'-tetrone, 4,4'-diamino-	high	low	low[a]
4151-51-3	Phenol, 4-isocyanato-, phosphorothioate	high	low	low[a]

	(3:1) (ester)			
4378-61-4	Dibenzo[*def*,*mno*]chrysene-6,12-dione, 4,10-dibromo-	low	low	low
5521-31-3[b]	Anthra[2,1,9-*def*:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2*H*,9*H*)-tetrone, 2,9-dimethyl-	moderate	moderate	moderate
5718-26-3	1*H*-Indole-5-carboxylic acid, 2-[(1,5-dihydro-3-methyl-5-oxo-1-phenyl-4H-pyrazol-4-ylidene)ethylidene]-2,3-dihydro-1,3,3-trimethyl-, methyl ester	high	low	low[a]
7576-65-0	1*H*-Indene-1,3(2*H*)-dione, 2-(3-hydroxy-2-quinolinyl)-	moderate	low	low
7789-36-8	Bromic acid, magnesium salt, hexahydrate			low[c]
8021-39-4	Creosote, wood	low	low	low
12068-03-0	Benzenesulfonic acid, methyl-, sodium salt	low	low	low
13676-91-0	9,10-Anthracenedione, 1,8-bis(phenylthio)-	high	low	low[a]
13680-35-8	Benzenamine, 4,4'-methylenebis[2,6-diethyl-	low	low	low
16294-75-0	14H-Anthra[2,1,9-mna]thioxanthen-14-one	low	low	low
18917-89-0[b]	Magnesium, bis(2-hydroxybenzoato-*O*1,*O*2)-, (T-4)-			low[d]
19286-75-0	9,10-Anthracenedione, 1-hydroxy-4-(phenylamino)-	high	low	low[a]
21564-17-0	Thiocyanic acid, (2-benzothiazolylthio)methyl ester	high	low	low[a]
24448-20-2	2-Propenoic acid, 2-methyl-, (1-methylethylidene)bis(4,1-phenyleneoxy-2,1-ethanediyl) ester	moderate	low	low
25428-43-7	3-Cyclohexene-1-methanol, α,4-dimethyl-α-(4-methyl-3-pentenyl)-, (*R*,*R*)-(±)-	low	low	low
25638-17-9[b]	Naphthalenesulfonic acid, butyl-, sodium salt	low	low	low[a]
26446-73-1	Phosphoric acid, bis(methylphenyl) phenyl ester	moderate	low	low[a]
28768-32-3	Oxiranemethanamine, *N*,*N*'-(methylenedi-4,1-phenylene)bis[*N*-(oxiranylmethyl)-	high	low	low[a]
31135-57-6	1*H*-Benzimidazolesulfonic acid, 2-heptadecyl-1-[(sulfophenyl)methyl]-, disodium salt	high	low	low[a]
33204-76-1	Cyclotetrasiloxane, 2,2,4,6,6,8-hexamethyl-4,8-diphenyl-, cis-	low	low	low
43048-08-4	2-Propenoic acid, 2-methyl-, (octahydro-4,7-methano-1*H*-indene-5,?-diyl)bis(methylene) ester	moderate	low	low
53980-88-4	2-Cyclohexene-1-octanoic acid, 5(or 6)-carboxy-4-hexyl-	moderate	low	low
61789-85-3[b]	Sulfonic acids, petroleum	high	low	low[a]
62973-79-9	Xanthylium, 9-(2-carboxyphenyl)-3,6-bis(diethylamino)-, molybdatesilicate	high	low	low[a]
63022-09-3	Xanthylium, 9-(2-carboxyphenyl)-3,6-	high	low	low[a]

	bis(diethylamino)-, molybdatephosphate			
66072-38-6	Oxirane, 2,2',2''-[methylidynetris(phenyleneoxymethylene)] tris-	high	low	low[a]
66241-11-0[b]	C.I. Leuco Sulphur Black 1	moderate	moderate	moderate
68310-07-6	Xanthylium, 3,6-bis(ethylamino)-9-[2-(methoxycarbonyl)phenyl]-2,7-dimethyl-, molybdatephosphate	low	low	low
68409-66-5	Ethanaminium, *N*-[4-[[4-(diethylamino)phenyl][4-(ethylamino)-1-naphthalenyl]methylene]-2,5-cyclohexadien-1-ylidene]-*N*-ethyl-, molybdatephosphate	high	low	low[a]
68442-82-0[b]	Calcium, carbonate dimethylhexanoate complexes	low	low	low[e]
68478-81-9[b]	9-Octadecenoic acid (*Z*)-, reaction products with 3-(dodecenyl)dihydro-2,5-furandione and triethylenetetramine	low	low	low
68527-01-5	Alkenes, C_{12-30} α-, bromo chloro	high	low	moderate[f]
68527-02-6[b]	Alkenes, C_{12-24}, chloro	high	low	moderate[f]
68604-99-9	Fatty acids, C_{18}-unsatd., phosphates	high	low	low[a]
68647-55-2	Fatty acids, tall-oil, esters with triethanolamine	low	low	low
68814-02-8	Ethanaminium, *N*-[4-[bis[4-(diethylamino)phenyl]methylene]-2,5-cyclohexadien-1-ylidene]-*N*-ethyl-, molybdatephosphate	high	low	low[a]
68890-99-3	Benzene, mono-C_{10-16}-alkyl derivs.	low	low	low
68909-77-3	Ethanol, 2,2'-oxybis-, reaction products with ammonia, morpholine derivs. Residues	low	high	low
68952-35-2[b]	Tar acids, cresylic, Ph phosphates	moderate	low	low
68953-80-0[b]	Benzene, mixed with toluene, dealkylation product	low	high	low
68987-42-8	Benzene, ethylenated, residues	low	low	low
70833-37-3	Nickel, bis(3-amino-4,5,6,7-tetrachloro-1*H*-isoindol-1-one oximato-N²,o1)-			low[d]
71011-25-1	Quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides, compds. with bentonite and bis(hydrogenated tallow alkyl)dimethylammonium chlorides	high	low	low[a]
71820-35-4	Fatty acids, tall-oil, low-boiling, reaction products with 1-piperazineethanamine	low	low	low
75627-12-2	Xanthylium, 3,6-bis(ethylamino)-9-[2-(methoxycarbonyl)phenyl]-2,7-dimethyl-, molybdatesilicate	high	low	moderate
80083-40-5	Xanthylium, 9-[2-(ethoxycarbonyl)phenyl]-3,6-bis(ethylamino)-2,7-dimethyl-, molybdatetungstatesilicate	high	low	low[a]
80939-62-4	Amines, C11-14-branched alkyl, monohexyl and dihexyl phosphates	low	low	low
90367-27-4	Ethanol, 2,2'-[[3-[(2-	low	low	low

	hydroxyethyl)amino]propyl]imino]bis-, *N*-tallow alkyl derivs.			
90459-62-4	Octadecanoic acid, reaction products with diethylenetriamine, di-Me sulfate-quaternized	high	low	low[a]
91081-53-7	Rosin, reaction products with formaldehyde	high	low	low[a]
102082-92-8	Xanthylium, 3,6-bis(diethylamino)-9-[2-(methoxycarbonyl)phenyl]-, molybdatesilicate	high	low	low[a]
106276-80-6	Benzoic acid, 2,3,4,5-tetrachloro-6-cyano-, methyl ester, reaction products with *p*-phenylenediamine and sodium methoxide	high	low	moderate
111174-61-9	Alcohols, C_{8-16}, reaction products with phosphorus oxide (P_2O_5), compds. with 2-ethyl-1-hexanamine	high	low	low[a]
115340-80-2	1-Propanaminium, 3-amino-*N*-ethyl-*N*,*N*-dimethyl-, *N*-wheat-oil acyl derivs., Et sulfates	high	low	low[a]
129828-23-5	Fatty acids, tall-oil, reaction products with Bu phenylmethyl phthalate, 2-(dimethylamino)ethanol, morpholine and overbased calcium petroleum sulfonates	low	low	low
CDSL#10685-2	Substituted dimercaptodithiazole	high	low	moderate
CDSL#10703-2	Substituted alkylphenol, calcium salt	high	low	moderate
CDSL#11053-1	Fatty acids compounded with ethylenediamine	low	low	low
CDSL#11555-8	Fatty acids, reaction products with maleic anhydride and triethanolamine	low	low	low
CDSL#11556-0	Fatty acids, reaction products with maleic anhydride	low	low	low
CDSL#11557-1	Fatty acids, reaction products with maleic anhydride and oleylamine	low	low	low

[a] The risk classification outcome for this substance was adjusted to low risk on the basis of its low potential for exposure.
[b]This substance was not identified under subsection 73(1) of CEPA but was included in this assessment as it was considered a priority because of other human health or ecological concerns.
[c]Low ecological concern as a result of the rapid screening of substances identified from phase one of the Domestic Substances List inventory update.
[d]Low ecological concern as a result of rapid screening of substances identified from phase two of the Domestic Substances List inventory update.
[e]Substance was run through ERC following publication of the science approach document.
[f]On the basis of additional evaluation, the ERC classification of ecological risk of the substance decreased following publication of the science approach document.

Appendix C. Substances with low potential for exposure of the general population, but requiring further assessment because of potential ecological concerns

CAS RN/ Confidential Ascension Number	Chemical Name
5470-11-1[a]	Hydroxylamine, hydrochloride
8050-28-0	Rosin, maleated
8052-10-6	Tall-oil rosin
25619-56-1	Naphthalenesulfonic acid, dinonyl-, barium salt
61789-87-5	Sulfonic acids, petroleum, magnesium salts
61790-48-5	Sulfonic acids, petroleum, barium salts
65652-41-7	Phosphoric acid, bis[(1,1-dimethylethyl)phenyl] phenyl ester
68188-19-2[a]	Paraffin waxes and Hydrocarbon waxes, chloro, chlorosulfonated
68425-61-6	Naphthalenesulfonic acid, bis(1-methylethyl)-, compd. with cyclohexanamine (1:1)
72854-22-9[a]	Paraffin waxes and Hydrocarbon waxes, chloro, sulfonated, ammonium salts
CDSL#11105-8	Phosphorothioic acid, dialkyl ester, alkylamine salt

[a]Ecological risk of substance to be evaluated

Appendix D. Substances with health or possible ecological effects of concern

CAS	Chemical Name	Health/Possible Ecological effect(s) of concern
74-88-4	Methane, iodo-	Human Health[a], Ecological[b]
78-21-7	Morpholinium, 4-ethyl-4-hexadecyl-, ethyl sulfate	Ecological[c]
90-93-7	Methanone, bis[4-(diethylamino)phenyl]-	Ecological[b]
95-54-5	1,2-Benzenediamine	Human Health[a], Ecological[b]
98-88-4	Benzoyl chloride	Human Health[a] Ecological[d]
100-00-5	Benzene, 1-chloro-4-nitro-	Human Health[a]
101-90-6	Oxirane, 2,2'-[1,3-phenylenebis(oxymethylene)]bis-	Human Health[a], Ecological[d]
112-90-3	9-Octadecen-1-amine, (*Z*)-	Ecological[b]
118-96-7	Benzene, 2-methyl-1,3,5-trinitro-	Human Health[a], Ecological[e]
121-14-2	Benzene, 1-methyl-2,4-dinitro-	Human Health[a], Ecological[e]
126-99-8	1,3-Butadiene, 2-chloro-	Human Health[a]
134-09-8	Cyclohexanol, 5-methyl-2-(1-methylethyl)-, 2-aminobenzoate	Ecological[f]
271-89-6	Benzofuran	Human Health[a]
556-52-5	Oxiranemethanol	Human Health[a]
630-20-6	Ethane, 1,1,1,2-tetrachloro-	Human Health[a]
632-99-5	Benzenamine, 4-[(4-aminophenyl)(4-imino-2,5-cyclohexadien-1-ylidene)methyl]-2-methyl-, monohydrochloride	Human Health[a,] Ecological[f]
1533-45-5	Benzoxazole, 2,2'-(1,2-ethenediyldi-4,1-phenylene)bis-	Ecological[b]
2387-03-3	1-Naphthalenecarboxaldehyde, 2-hydroxy-, [(2-hydroxy-1-naphthalenyl)methylene]hydrazone	Ecological[b]
2422-91-5	Benzene, 1,1',1''-methylidynetris[4-isocyanato-	Ecological[b]
2475-45-8	9,10-Anthracenedione, 1,4,5,8-tetraamino-	Human Health[a,] Ecological[b]
2478-20-8	1*H*-Benz[de]isoquinoline-1,3(2*H*)-dione, 6-amino-2-(2,4-dimethylphenyl)-	Ecological[f]
3426-43-5	Benzenesulfonic acid, 2,2'-(1,2-ethenediyl)bis[5-[[4-methoxy-6-(phenylamino)-1,3,5-triazin-2-yl]amino]-, disodium salt	Ecological[b]
4035-89-6	Imidodicarbonic diamide, *N*,*N*',2-tris(6-isocyanatohexyl)-	Ecological[b]
4051-63-2	[1,1'-Bianthracene]-9,9',10,10'-tetrone, 4,4'-diamino-	Ecological[b]
4151-51-3	Phenol, 4-isocyanato-, phosphorothioate (3:1) (ester)	Ecological[b]
5521-31-3	Anthra[2,1,9-*def*:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2*H*,9*H*)-tetrone, 2,9-dimethyl-	Ecological[e]
5718-26-3	1*H*-Indole-5-carboxylic acid, 2-[(1,5-dihydro-3-methyl-5-oxo-1-phenyl-4*H*-pyrazol-4-ylidene)ethylidene]-2,3-dihydro-1,3,3-trimethyl-, methyl ester	Ecological[b]
13676-91-0	9,10-Anthracenedione, 1,8-bis(phenylthio)-	Ecological[b]
19286-75-0	9,10-Anthracenedione, 1-hydroxy-4-(phenylamino)-	Ecological[b]
21564-17-0	Thiocyanic acid, (2-benzothiazolylthio)methyl	Ecological[b]

	ester	
25638-17-9	Naphthalenesulfonic acid, butyl-, sodium salt	Ecological[c]
26446-73-1	Phosphoric acid, bis(methylphenyl) phenyl ester	Ecological[c]
28768-32-3	Oxiranemethanamine, *N*,*N*'-(methylenedi-4,1-phenylene)bis[N-(oxiranylmethyl)-	Ecological[b]
31135-57-6	1*H*-Benzimidazolesulfonic acid, 2-heptadecyl-1-[(sulfophenyl)methyl]-, disodium salt	Ecological[b]
53980-88-4	2-Cyclohexene-1-octanoic acid, 5(or 6)-carboxy-4-hexyl-	Ecological[g]
61789-85-3	Sulfonic acids, petroleum	Ecological[b]
62973-79-9	Xanthylium, 9-(2-carboxyphenyl)-3,6-bis(diethylamino)-, molybdatesilicate	Ecological[b]
63022-09-3	Xanthylium, 9-(2-carboxyphenyl)-3,6-bis(diethylamino)-, molybdatephosphate	Ecological[b]
66072-38-6	Oxirane, 2,2',2''-[methylidynetris(phenyleneoxymethylene)]tris-	Ecological[b]
66241-11-0	C.I. Leuco Sulphur Black 1	Ecological[e]
68409-66-5	Ethanaminium, *N*-[4-[[4-(diethylamino)phenyl][4-(ethylamino)-1-naphthalenyl]methylene]-2,5-cyclohexadien-1-ylidene]-*N*-ethyl-, molybdatephosphate	Ecological[b]
68604-99-9	Fatty acids, C_{18}-unsatd., phosphates	Ecological[b]
68814-02-8	Ethanaminium, *N*-[4-[bis[4-(diethylamino)phenyl]methylene]-2,5-cyclohexadien-1-ylidene]-*N*-ethyl-, molybdatephosphate	Ecological[b]
68890-99-3	Benzene, mono-C_{10-16}-alkyl derivs.	Ecological[c]
68953-80-0	Benzene, mixed with toluene, dealkylation product	Human Health[a,]
71011-25-1	Quaternary ammonium compounds, benzyl(hydrogenated tallow alkyl)dimethyl, chlorides, compds. with bentonite and bis(hydrogenated tallow alkyl)dimethylammonium chlorides	Ecological[b]
75627-12-2	Xanthylium, 3,6-bis(ethylamino)-9-[2-(methoxycarbonyl)phenyl]-2,7-dimethyl-, molybdatesilicate	Ecological[e]
80083-40-5	Xanthylium, 9-[2-(ethoxycarbonyl)phenyl]-3,6-bis(ethylamino)-2,7-dimethyl-, molybdatetungstatesilicate	Ecological[b]
80939-62-4	Amines, C_{11-14}-branched alkyl, monohexyl and dihexyl phosphates	Ecological[c]
90367-27-4	Ethanol, 2,2'-[[3-[(2-hydroxyethyl)amino]propyl]imino]bis-, *N*-tallow alkyl derivs.	Ecological[c]
90459-62-4	Octadecanoic acid, reaction products with diethylenetriamine, di-Me sulfate-quaternized	Ecological[b]
91081-53-7	Rosin, reaction products with formaldehyde	Ecological[b]
102082-92-8	Xanthylium, 3,6-bis(diethylamino)-9-[2-(methoxycarbonyl)phenyl]-, molybdatesilicate	Ecological[b]
106276-80-6	Benzoic acid, 2,3,4,5-tetrachloro-6-cyano-, methyl ester, reaction products with *p*-phenylenediamine and sodium methoxide	Ecological[e]
111174-61-9	Alcohols, C_{8-16}, reaction products with	Ecological[b]

	phosphorus oxide (P_2O_5), compds. with 2-ethyl-1-hexanamine	
115340-80-2	1-Propanaminium, 3-amino-*N*-ethyl-*N*,*N*-dimethyl-, *N*-wheat-oil acyl derivs., Et sulfates	Ecological[b]
CDSL#10685-2	Substituted dimercaptodithiazole	Ecological[e]

[a] High health hazard was identified on the basis of classifications by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity or reproductive toxicity.
[b] ERC classified this substance as potentially having a high potency. The potential effects and how they may manifest in the environment were not further investigated due to the low ecological exposure of this substance.
[c]ERC classified this substance as having low potential for risk on the basis of current use patterns; however, it is structurally similar to substances having a higher potential for risk. The potential effects and how they may manifest in the environment were not further investigated due to the low ecological exposure of this substance..
[d] Structural alerts from the OECD toolbox identified this substance as potentially being a DNA and/or protein binder. The potential effects and how they may manifest in the environment were not further investigated due to the low ecological exposure of this substance.
[e]ERC classified this substance as having a moderate potential for risk; however, its chemical group was not prioritized for assessment at this time.
[f]Structural alerts from the OECD toolbox identified this substance as potentially being an endocrine receptor binder. The potential effects and how they may manifest in the environment were not further investigated due to the low ecological exposure of this substance. .
[g]ERC classified this substance as having low potential for risk on the basis of current use patterns; however, greater potential for local-scale exposure was identified.