Government of Canada / Gouvernement du Canada

Assessment

Select Hydrocarbon-based Substances

Environment and Climate Change Canada
Health Canada

April 2024

Canada

Cat. No.: En84-371/2024E-PDF
ISBN: 978-0-660-70500-2

Environment and Climate Change Canada
Public Inquiries Centre
Place Vincent Massey Building
351 Saint-Joseph Boulevard
Gatineau QC K1A 0H3
Telephone: 819-938-3860
Toll Free: 1-800-668-6767 (in Canada only)
Email: enviroinfo@ec.gc.ca

Aussi disponible en français

Synopsis

Pursuant to section 68 of the *Canadian Environmental Protection Act, 1999* (CEPA), the Minister of the Environment and the Minister of Health have conducted an assessment of eight hydrocarbon-based substances and have addressed an additional 35 hydrocarbon-based substances. The Chemical Abstracts Service Registry Numbers (CAS RN[1]), *Domestic Substances List* (DSL) names, and simplified or common names of the eight substances assessed are listed in the table below.

The eight hydrocarbon-based substances assessed in this assessment

CAS RN	DSL name	Simplified or common names
64742-16-1[a]	Petroleum resins	Petroleum resins
68131-77-1[a]	Distillates (petroleum), steam-cracked, polymd.	Hydrocarbon resin
68410-13-9[a]	Distillates (petroleum), steam-cracked, C_{5-12} fraction, polymd.	Polymerized C_{5-12} distillates
67891-82-1[a]	Hydrocarbon waxes (petroleum), oxidized, compds. with ethanolamine	Oxidized hydrocarbon waxes with EA
97862-84-5[a]	Hydrocarbon waxes (petroleum), oxidized, compds. with 2-(methylamino)ethanol	Oxidized hydrocarbon waxes with 2-MAE
68425-94-5[a]	Residues (petroleum), catalytic reformer fractionator, sulfonated, polymers with formaldehyde, sodium salts	Alkylated naphthalene sulfonate sodium salt polymers with formaldehyde
68526-82-9[a]	Alkenes, C6-10, hydroformylation products, high-boiling	Heavy oxo ends
68815-10-1[a]	Petroleum, sulfurized	Sulfurized petroleum

[a] This CAS RN is a UVCB (unknown or variable composition complex reaction products or biological materials).

Petroleum resins is used in asphalt, adhesives and sealants, lubricants and greases, and polishes and waxes. Petroleum resins appears in some cosmetics and natural health products as an adhesive. Hydrocarbon resin is used mostly in household and construction adhesive products and may be present in natural health products. The use of these two resin substances as adhesives and resin components is expected to have low exposure potential to the environment. The use of resin substances as components of asphalt is considered to have been addressed through the Asphalt and Oxidized

[1] The CAS RN is the property of the American Chemical Society, and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior written permission of the American Chemical Society.

Asphalt screening assessment, which concluded that these asphalt and oxidized asphalt substances have low potential of concern for the environment and human health. Polymerized C_{5-12} distillates, which is also a resin, is an intermediate petrochemical substance that is unlikely to leave petrochemical facilities without further processing, and no uses in products available to consumers in Canada have been identified for this substance. Based on experimental data for petroleum resins, and given their very low water solubility, these three resin substances are also expected to have low ecotoxicity and have low hazard potential to the environment. These three resins have low human health hazard potential based on their high molecular weight (500 Da to 2000 Da), and low volatility. In addition, dermal exposure to the two resin substances, following their specialized uses in high melt adhesives, is not expected to lead to systemic exposure to humans. Therefore, petroleum resins, hydrocarbon resin, and polymerized C_{5-12} distillates are unlikely to be causing harm to the environment, and the potential risk to human health from these substances is considered to be low.

Oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE are made up of oxidized petrolatum and alkanolamine constituents. Based on the available information, oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE are not expected to be in use in Canada. The constituents of these UVCB substances have been assessed previously through the Petrolatum and Waxes Group and the Alkanolamines and Fatty Alkanolamides Group screening assessments and were concluded not to meet any criteria under section 64 of CEPA. Available data also suggests that these constituent substances are of low toxicity and low bioavailability. Therefore, oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE are unlikely to be causing harm to the environment, and the potential risk to human health from these substances is considered to be low.

Alkylated naphthalene sulfonate sodium salt polymers with formaldehyde is used as a formulant in pest control products (which is addressed under the *Pest Control Products Act*), and industrially as a wetting agent, dispersant, surfactant, and penetrating agent. The industrial use of this substance is not expected to lead to environmental exposure, and its ecological hazard is expected to be low. This substance is absent from products available to consumers, and the general population is not expected to be exposed to this substance through environmental media or food. Therefore, alkylated naphthalene sulfonate sodium salt is unlikely to be causing harm to the environment and the potential risk to human health from this substance is considered to be low.

Heavy oxo ends is used as an industrial de-foamer and is not present in products available to consumers. Exposure of the general population in Canada is not expected. Heavy oxo ends is expected to be of low ecological risk based on no effects at high loading rates and limited environmental exposure. On the basis of these considerations, heavy oxo ends is unlikely to be causing harm to the environment and the potential risk to human health from this substance is considered to be low.

Sulfurized petroleum has industrial uses as a metal-working agent in industrial cutting oils where the sulfur additive performs an anti-wear function. Used metal-working fluids

are disposed of as “used oil” and are subject to the Code of Practice for Used Oil Management in Canada. No uses of this substance in products available to consumers were identified. On the basis of these considerations, exposure for the general population to this substance is not expected. Based on modelled data, sulfurized petroleum is expected to have a relatively low toxicity and low bioavailability. Sulfurized petroleum is unlikely to be causing harm to the environment and the potential risk to human health is considered to be low.

The human health assessment took into consideration those groups of individuals within the Canadian population who, due to greater susceptibility or greater exposure, may be more vulnerable to experiencing adverse health effects. The potential for exposure to substances for people living near industrial releases were considered in the assessment.

Considering all available lines of evidence presented in this assessment, there is low risk of harm to the environment from the eight hydrocarbon-based substances in this assessment. It is concluded that the eight hydrocarbon-based substances in this assessment 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.

Considering all the information presented in this assessment, it is concluded that the eight hydrocarbon-based substances in this assessment 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.

It is therefore concluded that the eight hydrocarbon-based substances in this assessment do not meet any of the criteria set out in section 64 of CEPA.

This report also addresses 35 hydrocarbon-based substances (identified in Table A-1 of Appendix A) for which risk assessment activities are considered to have already taken place under CEPA. Since these substances are not expected to contribute additional concerns to human health or to the environment beyond those that have already been identified in past assessments of similar substances, they will not undergo further assessment at this time. In addition, existing or future risk management actions related to the previous assessments, where applicable, are expected to address the risks from these substances.

Table of Contents

List of Tables .....

1. Introduction

Pursuant to section 68 of the *Canadian Environmental Protection Act, 1999* (CEPA) (Canada 1999), the Minister of the Environment and the Minister of Health have conducted an assessment of 8 hydrocarbon-based substances to determine whether they present or may present a risk to the environment or to human health. These eight substances were identified as priorities for assessment as they met categorization or were prioritized through other mechanisms (ECCC, HC [modified 2017]).

The substances addressed in this report are considered to be of unknown or variable composition complex reaction products or biological materials (UVCBs)[2]. This report has two parts. The eight hydrocarbon-based substances being assessed were divided into five subgroups based on their physical and chemical properties, as well as their anticipated uses, and their risks are characterized in five separate sections (Sections 2 to 6). The second part of this report (Section 7) includes an additional 35 hydrocarbon-based substances which were identified as priorities for assessment as they met categorization criteria or were prioritized through other mechanisms (ECCC, HC [modified 2017]) (see Table A-1, Appendix A). These 35 substances and for which risk assessment activities can be considered as having already taken place under CEPA (Environment Canada, Health Canada 2015; ECCC, HC 2017a). Based on their composition, physical-chemical properties and reported uses, these additional 35 substances were considered to fall within hydrocarbon-based groups that have previously been addressed under CEPA. These substances include 31 low boiling point naphthas (Environment Canada, Health Canada 2011, 2013a); two natural gases (ECCC, HC 2016a); and two substances that align with coal tars and their distillates [pitch and light oil (coal) coke-oven] (ECCC, HC 2021a). Identified uses of these 35 substances are not expected to result in exposures beyond those already considered in previous assessments. Existing or future risk management actions related to the previous assessments, when applicable, are expected to address the risks from these 35 substances. This assessment includes consideration of information on chemical properties, environmental fate, hazards, uses and exposures, including additional information submitted by stakeholders. Relevant data were identified up to February 2023.. Targeted literature searches were conducted up to February 2023. When available and relevant, information presented in assessments from other jurisdictions was considered.

This assessment was prepared by staff in the CEPA Risk Assessment Program at Health Canada and Environment and Climate Change Canada. The ecological and

[2] UVCBs are derived from natural sources or complex reactions. A UVCB is not an intentional mixture of discrete substances, and is considered a single substance. The complexity and variability of their compositions can make them difficult to fully and consistently characterize. .

human health portions of this assessment have undergone external written review and/or consultation. Comments were received from Mr. Geoff Granville (GCGranville Consulting Corp), Dr. Connie Gaudet, Ms. Theresa Lopez, Ms. Jennifer Flippin, and Dr. Joan Garey (the latter three from Tetra Tech). Additionally, the draft of this assessment (published January 8, 2022) was subject to a 60-day public comment period. While external comments were taken into consideration, the final content and outcome of this assessment remain the responsibility of Health Canada and Environment and Climate Change Canada.

This assessment focuses on information critical to determining whether substances meet the criteria as set out in section 64 of CEPA by considering scientific information, including information, if available, on subpopulations who may have greater susceptibility or greater exposure, vulnerable environments, and cumulative effects[3], and by incorporating a weight-of-evidence approach and precaution[4]. This assessment presents the critical information and considerations on which the conclusions are based.

2. Petroleum resins, hydrocarbon resin, polymerized C_{5-12} distillates (CAS RN[5]s 64742-16-1, 68131-77-1, 68410-13-9)

2.1 Substance identity and physical and chemical properties

Petroleum resins (CAS RN 64742-16-1) is a complex combination of organic compounds, predominantly hydrocarbons, obtained as a fraction of the solvent extract of residuum, which is derived from the vacuum distillation of petroleum (API 2017). Petroleum resins is considered within the United States Environmental Protection Agency (US EPA) asphalt category and is described as predominantly comprised of

[3] The consideration of cumulative effects under CEPA may involve an analysis, characterization and possible quantification of the combined risks to health or the environment from exposure to multiple chemicals.

[4] 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.

[5] The Chemical Abstracts Service Registry Number (CAS RN) is the property of the American Chemical Society and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior, written permission of the American Chemical Society.

high molecular weight compounds with high carbon-to-hydrogen ratios and a carbon number greater than 25 (US EPA 2011a, 2011b). Petroleum resins has a boiling point greater than 482°C (US EPA 2011a, 2011b; ECHA 2019a) and is primarily identified as a carbon chain polymer material. Its components have molecular weights in the range of 500 to 2000 Daltons. It is an inert viscous, semi-solid to solid substance, with low water solubility (less than 10^{-5} mg/L), and low vapour pressure (3×10^{-7} mm Hg ($4x10^{-5}$ Pa) or less) (US EPA 2011a, 2011b, Zohuriaan-Mehr and Omidian 2000). At 20°C, this substance is a solid in raw form with a density of 0.9 to 1.1 g/cm^3 and has a softening point between 90 and 100°C (SDS 2016d). The water solubility range of components of petroleum resins is between 3.5 x 10^{-4} and 8.1 x 10^{-4} mg/L at 20°C and a pH between 6.22 and 7.42 (ECHA 2019a).

Distillates (petroleum), steam-cracked, polymd. (CAS RN 68131-77-1), hereinafter referred to as hydrocarbon resin, is a complex combination of organic compounds prepared from the C5-C9 fraction of petroleum cracking by-products which are pre-treated, polymerized and distilled (Reehua Biotech Co. 2018). This substance is solid light yellow flakes or small granular solids and has a softening point between 80 and 105°C (LookChem 2018). This substance has a vapour pressure of <0.01 hPa and water solubility of <5 mg/L at 20°C (MSDS 2012a).

Distillates (petroleum), steam-cracked, C_{5-12} fraction, polymd. (CAS RN 68410-13-9), hereinafter referred to as polymerized C_{5-12} distillates, is a complex combination of organic compounds which includes polymers of dicyclopentadiene, polyvinyltoluene, polystyrene, or copolymers with these building units (Reehua 2018).

As these three substances are polymeric and are expected to have similar physical-chemical properties, they are assessed in a single chapter and available read across data is used to characterize their exposure and hazard potential.

These three substances are considered to be UVCBs.

2.2 Sources and uses

According to information submitted in response to a CEPA section 71 survey, and a voluntary data gathering initiative, uses of petroleum resins in Canada include in enamels, primers, and automotive protective paint materials and sealants (ECCC 2015, 2016).

Petroleum resins is primarily manufactured in refineries (Levelton 2011). Production quantities for petroleum resins in Canada were obtained through a voluntary data gathering initiative (ECCC 2016) and were reported to be < 1000 kg per year.

Petroleum resins is either sold in its original form, or is blended with, or processed with other asphaltic materials to produce end-use asphalt products, including speciality products such as pipe coatings, roofing adhesives, some special-use paints, and lubricants (US EPA 2011a). Searches of safety data sheet (SDS) databases identified

additional potential uses, including use as adhesives and coatings (SDS 2015a), as an ingredient in asphalt modifiers (SDS 2016a), and in lubricants (SDS 2015b).

With regards to non-asphalt related uses, petroleum resins is one of the components of hot melt glues (including glue sticks used by crafters) and tackifiers, in which it is present up to concentrations of 10-60%. Petroleum resins is used in solvent-based construction adhesives in mass fractions of 1-5% (MSDS 2004, 2011; SDS 2016b).

There is no definitive information on the use of petroleum resins in food packaging or as an incidental additive in Canada (personal communication, email from the Food Directorate, Health Canada (HC), to the Existing Substances Risk Assessment Bureau, HC, dated June 21, 2019; unreferenced). It does not appear in therapeutic products as a medicinal or non-medicinal ingredient (personal communication, email from the Therapeutic Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced). Petroleum resins is listed in the Natural Health Products Ingredients Database (NHPID) with a non-medicinal role for use as adhesive (NHPID 2023), as well as in the Licensed Natural Health Products Database (LNHPD) as being present as a non-medicinal ingredient, and in one licensed natural health product (LNHPD 2022). It is also present in a limited number of cosmetics as an adhesive in patch products (personal communication, email from the Consumer and Hazardous Products Safety Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 14, 2019; unreferenced).

According to information submitted in response to a CEPA section 71 survey and a voluntary data gathering initiative, industrial uses of hydrocarbon resin in Canada include rubber manufacturing, adhesives, paints and sealants, and as a binder for carbon electrodes used in aluminum smelting (ECCC 2015, 2016). Hydrocarbon resin is found in synthetic resin and raw material for manufacturing adhesives (SDS 2016b), sealants, coatings, printer inks, and rubber products (Levelton 2011; MSDS 2011, 2012a; SDS 2016c), and in concrete curing (MSDS 2013b). When used in solvent-based construction adhesives, they appear in mass fractions of 10-30%.

Hydrocarbon resin can be manufactured outside the petroleum sector, and is used as an intermediary substance in refineries and petrochemical industries (Levelton 2011). Due to the expected low hazard concern, hydrocarbon resin is exempt from reporting in the US EPA *Toxic Substances Control Act* (TSCA) under “Chemical Data Reporting Rule (flag XU) for polymers” (ChemIDplus 2017; US EPA 2019b, 2020).

Hydrocarbon resin may be used in adhesives used in food packaging in Canada but is not expected to have direct food contact (personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced). Hydrocarbon resin is listed in the NHPID with a non-medicinal role for use as adhesive (NHPID 2023), as well as in the LNHPD as being present as a non-medicinal ingredient, and in a limited number of licensed natural health products, such as wart, corn and callus removers and other foot-use products (LNHPD 2022).

Polymerized C_{5-12} distillates is an intermediate petrochemical substance (Levelton 2011). Polymerized C_{5-12} distillates was not included in surveys issued pursuant to section 71 of CEPA (Environment Canada 2008, 2011). A search of SDS, as well as consultation with petrochemical experts, resulted in no findings of recent information on Canadian manufacturing and import quantities or uses of polymerized C_{5-12} distillates in Canada or identified uses of polymerized C_{5-12} distillates in products in Canada. Due to its expected low hazard concern, this substance is under the polymer reporting exemptions of TSCA (US EPA 2019c).

No uses of polymerized C_{5-12} distillates in foods, natural health products, cosmetics, therapeutic or veterinary medicines have been reported in Canada (Personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced; Personal communication, email from the Natural and Non-prescription Health Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29 2019; unreferenced; Personal communication, email from the Consumer and Hazardous Products Safety Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 14, 2014; unreferenced; personal communication, email from the Therapeutic Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced).

2.3 Fate and exposure

Petroleum resins is primarily manufactured in refineries (Levelton 2011). Exposures associated with potential asphalt uses of petroleum resins were previously described in the Asphalt and Oxidized Asphalt screening assessment (ECCC, HC 2017c). Components of petroleum resins are expected to have high persistence and low bioaccumulation potential (ECCC, HC 2017c; US EPA 2011b).

Similar to asphalt, petroleum resins is expected to have low vapour pressure and very low water solubility under environmentally relevant conditions, and its components are not expected to disperse in the environment or to be bioavailable (ECCC, HC 2017c; US EPA 2011b). The hydrocarbon resin and polymerized C_{5-12} distillates have physical-chemical properties similar to the petroleum resins and are not expected to disperse in the environment.

Exposures to the general human population from petroleum resins and hydrocarbon resin through the use of construction adhesives are expected to be infrequent and incidental. Based on their uses as hot-melt thermoplastics for consumers, dermal contact to the hot glue is expected to be limited, and physical contact with these substances is expected to occur mostly after the adhesive has hardened into the cool, solid form. Hydrocarbon resin that may be used in adhesives used in food packaging in Canada is not expected to have direct food contact (personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced).

More sustained dermal exposures are expected from their use as adhesives or viscosity adjusters in the limited number of natural health products and cosmetics applied as tapes identified as containing petroleum resins or hydrocarbon resin. However, due to their low water solubility and high molecular weight (ECCC, HC 2017c; US EPA 2011a, 2011b; Zohuriaan-Mehr and Omidian 2000), these substances are expected to be associated with very low dermal absorption. Inhalation exposure to these substances is not expected due to their low vapour pressure.

No recent information on exposure of polymerized $C_{5\text{-}12}$ distillates on the environment could be identified. Its primary production locations have been refineries and the petrochemical industry, and it is unlikely to leave these facilities without further processing (Levelton 2011). Ecological and human exposures from environmental media to this substance are not expected.

2.4 Ecological and human health effects

2.4.1 Ecological effects

Similar to asphalt, petroleum resins are not expected to cause acute or chronic toxicity to aquatic organisms due to their extremely low water solubility (ECCC, HC 2017c). Petroleum resins were found to have no measurable acute toxicity to *Daphnia magna* in a 48-hour toxicity test using water-accommodated fraction (WAF) with a median effect loading rate[6] (EL_{50}) of > 100 mg/L or to the freshwater algae *Desmodesmus subspicatus* in a 72-hour toxicity test with an EL_{50} of > 100 mg/L (ECHA 2018c) similar to the low toxicity observed with asphalt (ECCC, HC 2017c). No additional aquatic or terrestrial toxicity data for petroleum resins were identified in literature. No ecotoxicity data were available for hydrocarbon resin or polymerized $C_{5\text{-}12}$ distillates; however, they are expected to have similar ecological effects as petroleum resins and are expected to be of low toxicity. They are also expected to have low hazard, consistent with their exemption from reporting under TSCA due to their low hazard concern (US EPA 2019c).

2.4.2 Human health effects

Petroleum resins, hydrocarbon resin, and polymerized $C_{5\text{-}12}$ distillates were not identified as posing a hazard to human health based on classifications by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity, or reproductive toxicity. These three substances are not included on the European

[6] A loading rate is the amount of petroleum substance added to the exposure solution to generate a WAF and is reported in mg/L. When used to describe an effect endpoint, the loading rate is the amount of petroleum substance added to generate a WAF that results in the effect reported; e.g., the lethal loading rate 50 (LL_{50}) is the amount of petroleum substance needed to generate a WAF that is lethal to 50% of the test organisms. A loading rate is not a direct measure of the concentration of the petroleum components dissolved in the exposure solution.

Chemicals Agency (ECHA)'s Candidate List of Substances of Very High Concern for Authorisation (ECHA 2019c). In their Tier I Human Health Assessment, NICNAS (2018) considered the hydrocarbon resin to be in the category of Low Concern Polymer.

Limited empirical health effects data were identified for these substances, which also included hazard information submitted to ECHA, under REACH requirements, as registration dossiers by other parties.

In an acute oral toxicity study [Organisation for Economic Co-operation and Development (OECD) test guideline 423], single-dose exposure to 2000 mg/kg-bw (gavage) of petroleum resin (CAS 64742-16-1) did not cause any mortality or signs of toxicity in female rats that were examined daily for up to 14 days post-exposure. A necropsy examination performed at the end of the study did not reveal any gross abnormalities. The study authors determined the LD_{50} value to be >2000 mg/kg-bw (ECHA 2018c; 2019a). Similarly, in an OECD test guideline 471 study, petroleum resin was found to be non-mutagenic in a bacterial reverse mutation assay in the presence and absence of metabolic activation in various *Salmonella typhimurium* strains. This substance did not show potential to cause skin sensitization in standard *in vitro* assays (ECHA 2018c). Due to its low acute oral toxicity, it has been assigned to Category 5 ("Warning; May be harmful if swallowed". No symbol required) based on the Globally Harmonized System of Classification and Labelling of Chemicals(ECHA 2019a).

For hydrocarbon resin (CAS 68131-77-1), the potential of the substance to cause skin sensitization has been identified (ECHA 2018a).

2.5 Risk characterization

The limited information available on the ecological hazard of these substances indicates that they present a low hazard to the environment. Release to the environment of petroleum resins, hydrocarbon resin, and polymerized C_{5-12} distillates are expected to be minimal and their components are not expected to disperse in the environment or to be bioavailable.

There is no indication in published literature that petroleum resins, hydrocarbon resin, and polymerized C_{5-12} distillates pose a hazard to human health. As noted in section 2.1, the available data indicate that these substances are of low concern, as evidenced from their exemption from reporting status in TSCA. Given the physical and chemical properties of these substances, including their high molecular weight and very low vapour pressure and water solubility, they are expected to have low potential for inhalation and dermal absorption.

Releases of petroleum resins, hydrocarbon resin, and polymerized C_{5-12} distillates are expected to be minimal such that exposure to the general population is not expected, and exposure to the environment is expected to be limited.

Therefore, the potential to cause harm to the environment or to human health for the general population of Canada is expected to be low.

3. Oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE (CAS RN 67891-82-1, 97862-84-5)

3.1 Substance identity

Hydrocarbon waxes (petroleum), oxidized, compds. with ethanolamine (CAS RN 67891-82-1), hereinafter referred to as oxidized hydrocarbon waxes with EA, and hydrocarbon waxes (petroleum), oxidized, compds. with 2-(methylamino)ethanol (CAS RN 97862-84-5), hereinafter referred to as oxidized hydrocarbon waxes with 2-MAE, are oxidized hydrocarbon waxes that consist of gel-like constituents of oxidized petrolatum and alkanolamines (PubChem 2019). The alkanolamine fatty acid salts are not expected to be volatile since these substances have high molecular weight and are in ionized (salt) form. These substances are considered to be UVCBs.

3.2 Sources and uses

A search of possible uses indicates these substances are primarily produced in refineries (Levelton 2011) and are reported to be used as metal-working fluid, specifically as mold-release agents and as lubricants (Kirk-Othmer 2019). These uses are expected to be restricted to the metalworking industry and would not result in general population exposure; in addition, no product uses in Canada of this nature were identified via a search of available SDS.

No uses of oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE in foods, natural health products, cosmetics, therapeutic or veterinary medicines, or pest control products have been reported in Canada (Personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced; Personal communication, email from the Natural and Non-prescription Health Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29 2019; unreferenced; Personal communication, email from the Consumer and Hazardous Products Safety Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 14, 2014; unreferenced; personal communication, email from the Therapeutic Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced; Personal communication, email from the Pest Management Regulatory Agency, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29, 2019).

3.3 Fate and exposure

Oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE are primarily produced in refineries (Levelton 2011). The persistence and bioaccumulation

potential of both oxidized petrolatum and the alkanolamines, which are constituents of these substances, were characterized in the Petrolatum and Waxes and the Alkanolamines and Fatty Alkanolamides Group screening assessments (ECCC, HC 2016b, 2020). Oxidized petrolatums are expected to have negligible water solubility and are therefore expected to have very low exposure to aquatic organisms within the water column (PubChem 2019; ECCC HC 2016a). If released to water, due to the waxy or gel-like form and low water solubility the oxidized petrolatum constituents of, oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE are not expected to remain in water and can be expected to partition to sediment. Although these substances are expected to be bioaccumulative, oxidative petrolatum constituents are not expected to biomagnify in aquatic or terrestrial webs and release of oxidized petrolatum to municipal wastewater are expected to be mostly removed by wastewater treatment plants as they are insoluble in water (ECCC, HC 2016b). Alkanolamines are not expected to persist in the environment or to bioaccumulate in organisms (ECCC, HC 2020). Given the waxy or gel-like form of the substance, it is expected that the high viscosity of the substance would lead to negligible releases from metalworking fluids as higher viscosity substances tend to remain on metalworking equipment (ECCC 2020). The uses of these two substances are expected to be limited to industrial settings and not lead to exposure of environmental media or the general population.

As these substances have not been identified in products available to consumers and have limited releases, low persistence and low bioavailability, exposure of the general population in Canada is not expected.

3.4 Ecological and human health effects

3.4.1 Ecological effects

Limited information on the ecological toxicity of oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE was identified. The ecological hazard potential of petrolatum and waxes, including oxidized petrolatum and alkanolamines, which are constituents of these substances, were characterized in the Petrolatum and Waxes and the Alkanolamines and Fatty Alkanolamides Group screening assessments (ECCC, HC 2016b, 2020) and was found to have low potential for harm to the environment. Read-across studies for petrolatum and wax suggest that these substances are of low toxicity and low bioavailability (ECCC, HC 2016b). Overall, potential for ecological harm from oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE is expected to be low.

3.4.2 Human health effects

No empirical health effects data was identified for these substances. Oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE were not identified as posing a hazard to human health based on classifications by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity, or reproductive toxicity. They are also not included on ECHA's Candidate List of

Substances of Very High Concern for Authorisation (ECHA 2019c). Read-across for petrolatum and wax suggest that these substances are of low toxicity to human health (ECCC, HC 2016b).

3.5 Risk characterization

Limited information was available on the ecological hazard of the substances. Both oxidized petrolatum and the alkanolamines, which are constituents of these substances, were characterized as being of low ecological hazard in the Petrolatum and Waxes and the Alkanolamines and Fatty Alkanolamides Group screening assessments (ECCC, HC 2016b, 2020). Although the hazard database is limited, the available data indicates that these substances are considered to be of low hazard for ecological harm and human health.

Expected uses of these substances as metalworking fluids/oils are in industrial settings. Metalworking fluids are often captured after use and recycled (Roberts 2015). Used metalworking fluids are disposed of as used oil and are subject to the Code of Practice for Used Oil Management in Canada (CCME 1989). Release to the environment of oxidized hydrocarbon waxes with EA and oxidized hydrocarbon waxes with 2-MAE from industrial facilities are expected to be minimal and their constituents are not expected to disperse in the environment or to be bioavailable to aquatic organisms.

The available data also indicates that these types of substances are considered to have a low ecotoxicity and low bioavailability.

The general population in Canada is not expected to be exposed to these substances through environmental media, food, or from the use of products available to consumers.

Therefore, the potential to cause harm to the environment or to human health for the general population of Canada is expected to be low.

4. Alkylated naphthalene sulfonate sodium salt polymers with formaldehyde (CAS RN 68425-94-5)

4.1 Substance identity and physical and chemical properties

Residues (petroleum), catalytic reformer fractionator, sulfonated, polymers with formaldehyde, sodium salts (CAS RN 68425-94-5), hereinafter referred to as alkylated naphthalene sulfonate sodium salt polymers with formaldehyde, has a vapour pressure of less than 130 Pa (1 mm Hg) (non-volatile) and has a specific gravity of less than 1. This substance is soluble in water (ECHA 2019d; MSDS 2013a). It consists of sodium naphthalene sulfonate or sodium alkylated-naphthalene sulfonate units connected by CH_2 linking groups from the process of hydroformylation. This substance is considered to be a UVCB.

4.2 Sources and uses

According to information submitted in response to a CEPA section 71 survey, and a voluntary data gathering initiative, reported industrial uses in Canada include as a road construction ingredient and in enamels (ECCC 2015, 2016). This substance is primarily produced in the petrochemical industry (Levelton 2011). The primary use of this substance is as a wetting agent, dispersant, surfactant, and penetrating agent (ECCC 2015, 2016) Alkylated naphthalene sulfonate sodium salt polymers with formaldehyde is used as an additive in the manufacture of concrete products (SDS 2013a), and as an additive in printer ink (SDS 2012b). No recent information on Canadian manufacturing and import quantities of this substance in Canada was available.

In Canada, alkylated naphthalene sulfonate sodium salt polymers with formaldehyde is also used as a formulant (dispersant/surfactant) in pest control products (personal communication, email from the Pest Management Regulatory Agency, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced). No uses of alkylated naphthalene sulfonate sodium salt in foods, natural health products, cosmetics, or veterinary medicines were reported in Canada (Personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced; Personal communication, email from the Natural and Non-prescription Health Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29 2019; unreferenced; Personal communication, email from the Consumer and Hazardous Products Safety Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 14, 2014; unreferenced; Personal communication, email from the Therapeutic Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced).

Naphthalenesulfonic acid, polymer with formaldehyde, sodium salt (CAS RN 9084-06-4), and 2-naphthalenesulfonic acid, polymer with formaldehyde, sodium salt (CAS RN 36290-04-7) are anionic surfactants which are considered analogues for naphthalenesulfonic acid, polymers with formaldehyde.

4.3 Fate and exposure

No information on environmental fate and behaviour for alkylated naphthalene sulfonate sodium salt polymers with formaldehyde was identified in the literature. Similar polymers are found to have a water extractability of less than 2% by weight (ECCC, HC 2018). Based on available information, including a literature search, SDS search, and discussions with experts in the petroleum field, this substance is not expected to exist in significant quantities in Canada and exposure to the environment in Canada is not expected.

Based on the available information, which indicates that this substance is not used in any products available to consumers, exposure of the general population in Canada to this substance is not expected.

Exposures to pesticides are evaluated under the *Pest Control Products Act* and are managed by Health Canada's Pest Management Regulatory Agency.

4.4 Ecological and human health effects

4.4.1 Ecological effects

No aquatic or terrestrial toxicity data for alkylated naphthalene sulfonate sodium salt polymers with formaldehyde was identified in the literature.

Substances of similar molecular structure, naphthalenesulfonic acid, polymer with formaldehyde, sodium salt and 2-naphthalenesulfonic acid, polymer with formaldehyde, sodium salt, were used to identify potential ecological effects of alkylated naphthalene sulfonate sodium salt polymers with formaldehyde. These analogues are polymers that are not expected to contain reactive functional groups associated with ecological hazard and, as per the *New Substances Notification Regulations for Chemicals and Polymers*, are considered to be of low potential to cause ecological harm (ECCC, HC [modified 2016]; 2018).

As such, the ecological effects from alkylated naphthalene sulfonate sodium salt polymers with formaldehyde are expected to be low.

4.4.2 Human health effects

No empirical health effects data was identified for this substance. Alkylated naphthalene sulfonate sodium salt polymers with formaldehyde was not identified as posing a high hazard to human health on the basis of classifications by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity, or reproductive toxicity. It is also not included on ECHA's Candidate List of Substances of Very High Concern for Authorisation (ECHA 2019c).

4.5 Risk characterization

On the basis of available information indicating that alkylated naphthalene sulfonate sodium salt polymers with formaldehyde is not in use in Canada, environmental exposure from this substance is expected to be limited.

Although data for alkylated naphthalene sulfonate sodium salt polymers with formaldehyde was not identified in the literature, data on substances similar to alkylated naphthalene sulfonate sodium salt polymers with formaldehyde were found not to meet the criteria set out in section 64 of CEPA and are considered to be of low risk to the environment in Canada and to human health (ECCC, HC [modified 2016]; 2018).

Alkylated naphthalene sulfonate sodium salt polymers with formaldehyde has not been reported to be found in products available to the consumer in Canada.

Release of alkylated naphthalene sulfonate sodium salt polymers with formaldehyde is expected to be minimal such that exposure to the general population is not expected.

On the basis of the absence of alkylated naphthalene sulfonate sodium salt polymers with formaldehyde in products available to consumers in Canada, and their limited environmental exposure, the potential to cause harm to the environment or to human health for the general population of Canada is expected to be low.

5. Heavy oxo ends (CAS RN 68526-82-9)

5.1 Substance identity and physical and chemical properties

Alkenes C_{6-10}, hydroformylation products, high-boiling (CAS RN 68526-82-9), hereinafter referred to as heavy oxo ends, consists of the high boiling residuum produced from the distillation of C_{7-11} alcohols (NCI 2015). This substance is a complex mixture of oxygenated branched and multi-isomeric alcohols (C_8-C_{11}) and aliphatic ethers (C_{16}-C_{22}). This substance is also known as octyl alcohols bottoms (US EPA 2019a). This substance is a liquid at room temperature with a boiling point between 136 and 480°C. This substance has a density of 0.86 g/cm^3 and a vapour pressure of 4.3 to 28 hPa between 20 and 50°C (BASF 2002; ECHA 2019b). The water solubility of this substance was determined by EPIWIN 3.05 using several typical components of this UVCB substance to gain an understanding of the range of water solubilities (BASF 2002). The most water-soluble components have a water solubility in the range of 100 mg/L with the higher limit of the solubility related to unreacted C_9 and C_{11} alcohols. Overall, components of this substance are considered to have solubility in the range of $4x10^{-5}$ (C_{22}) to 100 mg/L (C_9) at 20°C and, based on typical composition, while 26% of its components have a solubility of 1 mg/L or greater (BASF 2002). This substance is considered to be a UVCB.

5.2 Sources and uses

According to information submitted in response to a targeted CEPA section 71 information gathering initiative, heavy oxo ends is used in Canada as an industrial de-foamer (ECCC 2016). It is also globally used as a lubricant (Knobeloch and Anderson 2006), an intermediate in manufacturing (ECHA 2019b; Levelton 2011), and as a solvent which, in reaction with phthalic anhydride, is used to form phthalates that are used as vinyl plasticizers (Franke et al. 2012).

According to US EPA Inventory Update Reporting, the 2006 production volume for heavy oxo ends in the United States was between 1 million and $\leq$ 10 million lbs (453 600 to $\leq$ 4 536 000 kg) (US EPA 2011c). Recent US EPA Inventory Update Reports do not report production volumes for heavy oxo ends (US EPA 2012, 2016). No recent information on Canadian manufacturing or import quantities or uses of these substances in Canada outside of qualitative uses reported in response to a CEPA section 71 survey (ECCC 2016) was identified.

No products available to consumers in Canada which include this substance have been identified.

Heavy oxo ends may be used as a component in coatings used on corrugated boxes used as food packaging in Canada with the potential for direct food contact. However, the exposure potential to this substance through food is considered negligible (personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced). No uses of heavy oxo ends in natural health products, cosmetics, therapeutic or veterinary medicines have been reported (Personal communication, email from the Natural and Non-prescription Health Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29 2019; unreferenced; Personal communication, email from the Consumer and Hazardous Products Safety Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 14, 2014; unreferenced; Personal communication, email from the Therapeutic Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced).

5.3 Fate and exposure

The higher carbon components of the heavy oxo ends are water insoluble and this substance does not hydrolyze readily in water (BASF 2002). The substance is inherently biodegradable in water with 49.99% biodegradation in 28 days (ECHA 2019c). Data on the most soluble components (C_9-C_{13} alcohols) indicate that linear alcohols are readily biodegradable (OECD 2006b), as well as mixtures of oxo alcohols (e.g., alcohols similar to those found in heavy oxo ends) (OECD 2006a).

Due to the physical-chemical properties of most of its components (relatively low vapour pressure and water solubility) (BASF 2002), environmental exposure is expected to be low. Its soluble components (C_9 – C_{13} alcohols) are expected to be readily degraded. When used as an industrial defoamer, heavy oxo ends will undergo wastewater treatment; wastewater removal modelling (SimpleTreat version 3.1 2003) for soluble C_9 and C_{13} alcohols indicate 88% or greater removal during secondary wastewater treatment.

No uses of this substance in products available to consumers have been identified and exposure of the general population in Canada to heavy oxo ends through environmental media and product use is not expected.

5.4 Ecological and human health effects

5.4.1 Ecological effects

Heavy oxo ends was found to be of low hazard to rainbow trout (*Oncorhynchus mykiss*) in a 96-hour toxicity test utilizing a WAF with a non-lethal loading rate (LL_0) of >1000 or 0.71 mg/L measured (ECHA 2019b). Heavy oxo ends was also found to have no lethal effects on two species of fish (*Lepomis macrochirus* and *Oncorhynchus mykiss*

*(*formally referred to as *Salmo gairdneri)*) in a 96-hour toxicity test with an LC_0 > 1000 mg/L (nominal) (BASF 2002).

This substance was found to be acutely hazardous when administered with a solvent to *Daphnia magna* in a 48-hour toxicity test with a no-observed-effect concentration of 0.1 mg/L (nominal) and an EC_{50} of 0.17 mg/L (nominal) (BASF 2002). It is expected that this represents the toxicity of the soluble alcohol components; and is similar to or lower than that observed for invertebrates and fish with $C_{9\text{-}13}$ oxo alcohols (0.39 – 17.1 mg/L and 0.42 – 11 mg/L, respectively) (OECD 2006a). Most other components of oxo heavy ends have low to very low water solubility. The use of a solvent in the test with *Daphnia magna* might have increased the bioavailability of components not usually soluble, such as higher carbon-chain alcohols that are more toxic than alcohols with shorter carbon chains (OECD 2006b) or other non-soluble components. Therefore, there is uncertainty regarding the results of this study.

Most of the water-soluble components (water solubility >1 mg/L) of heavy oxo ends are $C_{9\text{-}13}$ alcohols. Oxo alcohols in this range have toxicities to fish and invertebrates ranging from approximately 0.4 to 20 mg/L (OECD 2006a).

5.4.2 Human health effects

No empirical health effects data was identified for this substance. Heavy oxo ends was not identified as posing a high hazard to human health on the basis of classifications by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity, or reproductive toxicity. It is also not included on ECHA's Candidate List of Substances of Very High Concern for Authorisation (ECHA 2019c).

5.5 Risk characterization

While certain components of heavy oxo ends (that is, $C_{9\text{-}13}$ alcohols) are soluble and have moderate to high hazard, these same components are expected to be largely removed (approximately 90% removal) during wastewater treatment, and any remaining alcohols are expected to readily degrade if released to the environment. Environmental exposure to the remainder of the components is expected to be minimal due to their low to very low water solubility. A WAF study with fish demonstrated that even at high loading rates (1000 mg/L), only a small amount of heavy oxo ends was soluble in water (0.71 mg/L) and this was determined not to be hazardous. Therefore, the risk to the environment in Canada is expected to be low.

The general population in Canada is not expected to be exposed to this substance through environmental media or from the use of products available to consumers. Exposure from food is considered to be negligible. On the basis of the low exposure, the risk to human health is considered to be low.

On the basis of the absence of heavy oxo ends in products available to consumers in Canada, and their limited environmental exposure, the potential to cause harm to the

environment or to human health for the general population of Canada is expected to be low.

6. Sulfurized petroleum (CAS RN 68815-10-1)

6.1 Substance identity

Petroleum, sulfurized (CAS RN 68815-10-1) is hereinafter referred to as sulfurized petroleum. Sulfurization of unsaturated compounds involves addition of sulfur compounds (elemental sulfur, hydrogen sulfide, and/or mercaptans) to the substance. For example, sulfurized mineral oils can be made by dissolving elemental sulfur (flowers of sulfur) in mineral oil by heating (Farng and Jao 2017, Rossrucker et al. 2017).

Sulfurized olefins, as found in sulfurized petroleum, function mainly through thermal decomposition mechanisms, whereby the sulfur-carbon bonds dissociate at high temperature and the resulting sulfur combines with a metal to form a ductile metal sulfide surface film. Sulfur prevents contact between interacting ferrous metal surfaces through the formation of an intermediate film of iron sulfide which decreases the wear rate while accelerating the smoothing of the metal surfaces (Farng and Jao 2017). Sulfurized olefins or other oils are usually used under high pressure and temperature conditions. This substance is considered to be a UVCB.

6.2 Sources and uses

According to information submitted under a voluntary data gathering initiative, sulfurized petroleum is used in an industrial cutting fluid in Canada (ECCC 2016). The sulfur additive performs an anti-wear function in the cutting oil by forming a film between cutting tool and work piece. Sulfur-containing additives are used to provide protection against high-pressure, metal-to-metal contacts in boundary lubrication. This substance is primarily produced in refineries (Levelton 2011).

No uses in products available to consumers in Canada were identified for this substance.

No uses of sulfurized petroleum in foods, natural health products, cosmetics, therapeutic or veterinary medicines, or pest control products have been reported in Canada [Personal communication, email from the Food Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 25, 2019; unreferenced; Personal communication, email from the Natural and Non-prescription Health Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29 2019; unreferenced; Personal communication, email from the Consumer and Hazardous Products Safety Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 14, 2014; unreferenced; Personal communication, email from the Therapeutic Products Directorate, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 7, 2019; unreferenced;

Personal communication, email from the Pest Management Regulatory Agency, HC, to the Existing Substances Risk Assessment Bureau, HC, dated March 29, 2019].

6.3 Fate and exposure

No information on ecological fate and exposure of sulfurized petroleum could be identified in the literature.

Expected uses of the substance in metalworking fluids are primarily in occupational and industrial settings. Metalworking fluids are often captured after use and recycled (Roberts 2015). Used metalworking fluids are disposed of as used oil and are subject to the Code of Practice for Used Oil Management in Canada (CCME 1989). Hazards related to chemicals used in the workplace are defined within the Workplace Hazardous Materials Information System (WHMIS). For information concerning workplace health and safety and what steps to take in the workplace, Canadians should consult their employer and/or the Occupational Health and Safety Regulator in their jurisdiction.

No uses in products available to consumers were identified for this substance. Exposure of the general population in Canada to sulfurized petroleum is not expected.

6.4 Ecological and human health effects

6.4.1 Ecological effects

No aquatic or terrestrial toxicity data for sulfurized petroleum could be identified in the literature. Based on modelled data from ECOSAR 2.0, sulfurized petroleum is insufficiently soluble to cause measurable toxic effects on aquatic organisms at its solubility limit (ECOSAR 2017).

6.4.2 Human health effects

No empirical health effects data were identified for this substance. Sulfurized petroleum was not identified as posing a high hazard to human health on the basis of classifications by other national or international agencies for carcinogenicity, genotoxicity, developmental toxicity, or reproductive toxicity. It is also not included on ECHA's Candidate List of Substances of Very High Concern for Authorisation (ECHA 2019c). Further investigation of health effects is not warranted at this time given the low expected exposure of the general Canadian population.

6.5 Risk characterization

On the basis of sulfurized petroleum being used in metalworking in industrial settings where the substances are often captured after use and recycled, it is expected to have a low potential for release, and the environmental exposure from this substance is expected to be limited. Based on modelled data, sulfurized petroleum is expected to

have relatively low toxicity, and therefore quantitative characterization of exposure (that is, derivation of exposure estimates) was not conducted.

Exposure of the general population to sulfurized petroleum through environmental media, food, or the use of products available to consumers is not expected.
On the basis of the absence of sulfurized petroleum from products available to the consumers in Canada and the resulting limited environmental exposure, the exposure from this substance to the general population of Canada is not expected.

Release of sulfurized petroleum is expected to be minimal such that exposure to the general population is not expected, and exposure to the environment is expected to be limited. Therefore, the potential to cause harm to the environment or to human health for the general population of Canada is expected to be low.

7. Substances addressed under previous risk assessments

Thirty-five hydrocarbon-based substances were identified as priorities for assessment For these 35 substances, risk assessment activities can be considered as having already taken place under previous risk assessments under CEPA (Environment Canada, Health Canada 2011, 2013a, 2015; ECCC, HC 2016a, 2017a, 2021a). As a result, these 35 substances were identified as not requiring further risk assessment at this time. In addition, existing or future risk management actions resulting from previous assessments, where applicable, are expected to address the risks of these substances.

Additional risk assessment or risk management activities may be undertaken if new information becomes available on these substances, including: 1) identification of new hazard or exposure information which may impact previous risk analyses; 2) international activities; or 3) risk management activities including performance measurement.

The list of the 35 hydrocarbon substances for which risk assessment activities can be considered as having already taken place is provided in Table A-1 in Appendix A. These substances are described in the following subsections.

7.1 Low boiling point naphthas

Low boiling point naphthas (LBPNs) are complex and highly variable combinations of volatile hydrocarbons, predominantly in the carbon range of C_4 to C_{12}.

The 31 LBPNs listed in Table A-1 in Appendix A have been identified as petroleum site-restricted or industry-restricted and do not appear in any products available to consumers. They may be transported from petroleum sector facilities to other industrial facilities by ship or truck. They can be intermediate streams consumed within a facility, blended into a mixture leaving the facility under different CAS RNs or transported off-site for use as a feedstock in other industrial facilities. LBPNs were previously assessed under the Site-Restricted LBPNs screening assessment and the Industry-Restricted

LBPNs screening assessment and were found to not meet the criteria set out in section 64 of CEPA (Environment Canada, Health Canada 2011, 2013a) and no additional general population and environmental media exposures to the LBPN substances of this group are expected beyond those already considered in these screening assessments .

As such, these substances are considered to have been addressed and will not be subject to further risk assessment at this time.

7.2 Natural gas and natural gas, dried (CAS RNs 8006-14-2 and 68410-63-9)

Natural gas and natural gas, dried, are part of the substances broadly classified as petroleum and refinery gases (PRGs), which also includes liquefied petroleum gases.

PRGs are complex and highly variable combinations of volatile hydrocarbons predominantly in the carbon range of C_1 to C_7, and are produced in petroleum facilities (that is, refineries and natural gas processing facilities).

PRGs were previously assessed under two Petroleum and Refinery Gases screening assessments (Environment Canada, Health Canada 2011, 2013b) as well as the Liquefied Petroleum Gases screening assessment (ECCC, HC 2016a) and were found to meet the criteria under paragraph 64(*c*) of CEPA due to their contribution to overall petroleum refinery emissions, specifically of 1,3-butadiene. The Environment and Climate Change Canada and Heath Canada (2016a) assessment, however, notes that human health risks from volatile emissions at natural gas processing facilities, where natural gas and natural gas, dried are produced, are low, based on laboratory testing and other lines of evidence demonstrating that appreciable concentrations of 1,3-butadiene are not expected to be present in gas streams at natural gas processing facilities.

Potential exposures from natural gas and natural gas, dried are considered to have been addressed under the Liquefied Petroleum Gases screening assessment (ECCC, HC 2016a) and include releases within facilities from activities associated with their production and processing, releases related to their transportation between industrial facilities, and release during consumer uses. No additional general population and environmental media exposures from natural gas and natural gas, dried beyond those already considered in the Liquefied Petroleum Gases screening assessment are expected. Risk management for PRGs occurs under the existing Risk Management Approach for Liquefied Petroleum Gases (ECCC, HC 2017).

As such, natural gas and natural gas, dried, will not be subject to further risk assessment at this time and will be addressed by subsequent risk management measures that are being, or have been, developed for PRGs. The *Regulations Respecting Reduction in the Release of Volatile Organic Compounds (Petroleum Sector)* will also address natural gas and natural gas, dried (CAS RNs 8006-14-2 and 68410-63-9).

7.3 Pitch (CAS RN 61789-60-4)

Pitch is a residue resulting from the distillation of coal tar. Coal tars and their distillates, which include coal tar pitches, have been previously assessed under the Coal Tars and their Distillates Assessment (ECCC, HC 2021a). Pitch (CAS RN 61789-60-4) is considered to fit the general description of the substance named high-temperature coal tar pitch (CAS RN 65996-93-2). No additional general population and environmental media exposures to pitch beyond those already captured in the Coal Tars and their Distillates screening assessment are expected.

The substances in the Coal Tars and their Distillates screening assessment (ECCC, HC 2021a) met the criteria under paragraphs 64(*a*) and (*c*) of CEPA and risk management measures for these substances are outlined in the Risk Management Approach for Coal Tars and their Distillates (ECCC, HC 2021b), wherein they have been recommended to be added to the *List of Toxic Substances* in Schedule 1 of CEPA.

Pitch is considered to fall within the scope of the Coal Tars and their Distillates screening assessment and will, therefore, not be subject to further risk assessment at this time. It will be addressed by any subsequent risk management measures that are being or have been developed for the Coal Tars and their Distillates Group.

7.4 Light oil (coal) coke-oven (CAS RN 65996-78-3)

Light oil (coal) coke-oven is a stream of the coal tar production process. It is a volatile organic liquid extracted from the gas evolved in the high temperature (greater than 700°C) destructive distillation of coal. It is composed primarily of benzene, toluene, and xylenes. It may contain other minor hydrocarbon components. This substance is also called benzole (benzol) (ECHA 2018b). This substance is considered to fall within the scope of Coal Tars and their Distillates Group screening assessment (ECCC, HC 2021a).

Coal tars are the condensation products obtained by cooling, to approximately ambient temperature, the gas evolved in the destructive distillation (pyrolysis) of coal (Betts 2000) that occurs at integrated steel mills, with the resulting coal tars often delineated by the pyrolysis temperature (low or high). Coal tar distillates are various boiling point fractions derived from the distillation of coal tars at a coal tar refiner and include both the fractions obtained from the distillation tower as well as the residue remaining following distillation. The Coal Tars and their Distillates screening assessment concluded that these substances have the potential to cause harm to the environment and the general population, and met the criteria under paragraphs 64(*a*) and (*c*) of CEPA (ECCC, HC 2021a), due to releases of hazardous substances such as polycyclic aromatic hydrocarbons and benzene. The production of light oil (coal) coke-oven in integrated steel mills is addressed through existing regulations (Environment Canada 2001).

Light oil (coal) coke-oven is recognized to be of high benzene content (typically 60% or greater) and is used as a feedstock in the chemical industry for the production of aromatic chemicals. The uses of benzene in chemical production and as a solvent are considered in the Benzene Priority Substance List Assessment Report (Canada 1993).

The manufacture and use of light oil (coal) coke-oven are considered to have been assessed as part of the Coal Tars and their Distillates screening assessment (ECCC, HC 2021a) and the Benzene Priority Substance List Assessment Report (Canada 1993). As no general population and environmental media exposures beyond those already considered in these two assessments are expected, this substance will not be subject to further risk assessment at this time and will be addressed by risk management measures that are being or have been developed for the Coal Tars and their Distillates Group or for benzene. Based on the high benzene concentration in Light oil (coal) coke oven, it is considered a high hazard substance for human health and there may be a concern for human health if exposures to this substance were to increase.

The human health assessment took into consideration those groups of individuals within the Canadian population who, due to greater susceptibility or greater exposure, may be more vulnerable to experiencing adverse health effects. The potential for exposure to substances for people living near industrial releases were considered in the assessment.

8. Conclusion

Considering all available lines of evidence presented in this assessment, there is low risk of harm to the environment from the eight hydrocarbon-based substances in this assessment. It is concluded that the eight hydrocarbon-based substances in this assessment 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 assessment, it is concluded that the eight hydrocarbon-based substances in this assessment 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.

It is therefore concluded that the eight hydrocarbon-based substances assessed in this assessment do not meet any of the criteria set out in section 64 of CEPA.

Based on their composition, physical-chemical properties and reported uses, 35 substances (31 LBPNs; two natural gases; pitch and light oil (coal) coke-oven) are

considered to fall within the scope of hydrocarbon groups which have previously been assessed under CEPA. Identified uses of these 35 substances are not expected to result in exposures beyond those already considered in previous screening assessments. Since these substances are not expected to contribute additional concern to human health or the environment beyond those that have already been identified in past screening assessments of similar substances, they will not undergo further assessment at this time. In addition, existing or future risk management actions related to the previous screening assessments, when applicable, are expected to address the risks from these substances.

References

[API] American Petroleum Institute. 2017. Asphalt category. The American Petroleum Institute Petroleum HPV Testing Group. Washington, DC. [accessed 2019 Oct 30].

[BASF] BASF Corporation. 2002. HPV Data Set EP-290 Robust Summary. Alkenes, C6-10, hydroformylation products, high boiling. [accessed 2018 June 4].

[Canada] Canadian Environmental Protection Act. 1993. Priority Substances List Assessment Report. Benzene. Ottawa, ON. [accessed 2019 June 6].

[Canada] *Canadian Environmental Protection Act, 1999*. S.C. 1999, c.33. Canada Gazette Part III, vol. 22, no. 3. 2019 May 6]

[CCME] Canadian Council of Ministers of the Environment. 1989. Code of Practice for Used Oil Management in Canada. Environment Canada, Ottawa. [accessed 2019 June 24].

ChemIDplus. 2017. ChemIDplus. US National Library of Medicine. Bethesda (MD): National Institutes of Health. [accessed 2021 September 28].

[ECCC] Environment and Climate Change Canada. 2015. Data collected under the *Canadian Environmental Protection Act, 1999*, section 71: *Notice with respect to certain substances on the Domestic Substances List.* Data prepared by: Environment Canada, Health Canada; Existing Substances Program.

[ECCC] Environment and Climate Change Canada. 2016. Data collected from a targeted information gathering initiative for assessments under the Chemicals Management Plan (Fall 2016). Data prepared by: ECCC, Health Canada; Existing Substances Program.

[ECCC] Environment and Climate Change Canada. 2020. Supporting Documentation for the Ecological Exposure Assessment of TPAEs. Gatineau (QC): Government of Canada. Available from: eccc.substances.eccc@canada.ca

[ECCC, HC] Environment and Climate Change Canada, Health Canada. [Modified 2016]. Rapid Screening Assessment of Polymers Identified from Phase Two of the Domestic Substances List Inventory Update. Ottawa (ON): Government of Canada. [Accessed 2019 Dec 16]

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2016a. Screening Assessment: Petroleum Sector Stream Approach: Liquefied Petroleum Gases [Stream 4] Petroleum and Refinery Gases [accessed 2019 May 16]

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2016b. Screening Assessment: Petroleum Sector Stream Approach: Petrolatum and Waxes [Stream 4]. [Accessed 2017 March 14]

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2017a. Approach for a subset of petroleum substances prioritized during categorization. Ottawa (ON): Government of Canada. [accessed 2019 Oct 7].

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2017b. Risk management approach for Liquefied Petroleum Gases stream 4 petroleum and refinery Gases. Ottawa (ON): Government of Canada [accessed 2019 May 16].

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2017c. Screening Assessment: Petroleum Sector Stream Approach: Asphalt and Oxidized Asphalt. Ottawa (ON): Government of Canada. [accessed 2018 June 4].

[ECCC, HC] Environment and Climate Change Canada, Health Canada. [Modified 2017]. Categorization of Chemical Substances. Ottawa (ON): Government of Canada. [accessed 2017 July 28].

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2018. Second Phase of Polymer Rapid Screening. Ottawa (ON): Government of Canada.

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2020. Screening Assessment: Alkanolamines and Fatty Alkanolamides. Ottawa (ON): Government of Canada.

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2021a. Screening Assessment: Coal tars and their Distillates. Ottawa (ON): Government of Canada.

[ECCC, HC] Environment and Climate Change Canada, Health Canada. 2021b. Risk Management Approach for Coal tars and their Distillates. Ottawa (ON): Government of Canada.

[ECHA] European Chemicals Agency. 2018a. Distillates (petroleum), steam-cracked, polymerized. Helsinki (FI): ECHA. [accessed 2019 May 1].

[ECHA] European Chemicals Agency. 2018b. Light oil (coal), coke-oven. Helsinki (FI): ECHA. [accessed 2018 July 18].

[ECHA] European Chemicals Agency. 2018c. Registration dossier: Petroleum Resins (CAS RN 64742-16-1). Helsinki (FI): ECHA. [accessed 2019 September].

[ECHA] European Chemicals Agency. 2019a. Petroleum Resins, Brief Profile. Helsinki (FI): ECHA. [accessed 2019 May 1].

[ECHA] European Chemicals Agency. 2019b. Alkanes, C6-10, hydroformulation products, high-boiling. Helsinki (FI): ECHA. [accessed 2019 May 1].

[ECHA] European Chemicals Agency. 2019c. Candidate List of Substances of Very High Concern for Authorisation [Internet]. Helsinki (FI): European Chemicals Agency. [accessed June 2019].

[ECHA] European Chemicals Agency. 2019d. Alkylated naphthalene sulfonate sodium salt (CAS RN 68425-17-1). Helsinki, FI [accessed 2019 June 24]

[ECOSAR] Ecological Structure Activity Relationships Class Program [estimation model]. 2017. Ver. 2.0 Washington (DC): US Environmental Protection Agency, Office of Pollution Prevention and Toxics; Syracuse (NY): Syracuse Research Corporation. [Accessed 2018 June 4].

Environment Canada. 2001. Environment code of practice for integrated steel mills. CEPA 1999 Code of Practice. Ottawa (ON). [accessed 2019 September 26].

Environment Canada. 2008. *Canadian Environmental Protection Act, 1999*, Section 71: *Notice with respect to certain high priority petroleum substances*. Canada Gazette, Part I, Vol. 142, no. 10. [accessed 2019 Jan 10].

Environment Canada. 2011. *Canadian Environmental Protection Act, 1999* , Section 71: Guidance for responding to the *Notice with respect to certain high priority petroleum substances on the Domestic Substances List*. Canada Gazette, Part I,Vol. 145, no. 51. Dec. 17, 2011.pp. 3740–3762. [accessed 2019 May 16].

Environment Canada, Health Canada. 2011. Low Boiling Point Naphthas (Site Restricted). Final Screening Assessment, Petroleum Sector Stream Approach. Ottawa. [accessed 2019 June 28].

Environment Canada, Health Canada. 2013a. Low Boiling Point Naphthas (Industry Restricted). Final Screening Assessment, Petroleum Sector Stream Approach. Ottawa. [accessed 2019 June 28].

Environment Canada, Health Canada. 2013b. Petroleum Sector Stream Approach: Petroleum and Refinery Gases [Site-Restricted]. Ottawa (ON): Government of Canada. [accessed 2019 January 24].

Environment Canada, Health Canada. 2014. Final Screening Assessment: Petroleum Sector Stream Approach: Petroleum and Refinery Gases [Industry Restricted]. Ottawa (ON): Government of Canada. [accessed 2019 May 16].

Environment Canada, Health Canada. 2015. Approach for a Subset of Substances Prioritized during Categorization That Have Already Been Addressed. Ottawa (ON): Environment Canada, Health Canada. [accessed 2017 November 16].

Farng LO, Jao T-Z. 2017. Ashless Anttwear and Antiscuffing (Extremen Pressure) Additives. In: Rudnick LR, editor. Lubricant Additives: Chemistry and Applications, 3rd edition. Boca Raton (FL): CRC Press.

Franke R, Selent D, Börner A. 2012. Applied Hydroformylation. Chem. Rev. 112: 5675-5732.

[Kirk-Othmer] Kirk-Othmer Encyclopedia of Chemical Technology. 2019. Alkanolamines from olefin oxides and ammonia. Edens MR, Lochary JF. Vol. 2. [accessed 2019 May 22].

Knobeloch L, Anderson H. 2006. Use of the HPVIS to identify Chemicals that may pose a Threat to the Great Lakes Fishery. Madison (WI): Wisconsin Department of Health and Family Services.

[Levelton] Levelton Consultants Ltd. 2011. Background technical study on the release potential for certain moderate priority petroleum substances under the chemicals management plan. Richmond (BC): Levelton Consultants Ltd.

[LNHPD] Licensed Natural Health Products Database. 2022. [database on the internet]. Ottawa (ON): Health Canada. [accessed 2023 February 9].

[LookChem 2018] LookChem. 2018. Petroleum Hydrocarbon Resin CAS NO. 68131-77-1. Huangzhou, China. [accessed 2019 May 1].

[MSDS] Material Safety Data Sheet. 2004. Sun-Tack C9 Petroleum Resin. Taipei, (TW): United Performance Materials Corporation. Taiwan.

[MSDS] Material Safety Data Sheet. 2011. LePage PL Landscape Block Adhesive. Mississauga (ON). Henkel Canada Corp.

[MSDS] Material Safety Data Sheet. 2012a. Novares TL 90. Duisburg (DE): RÜTGERS Novares.. [accessed 2018 June 12].

[MSDS] Material Safety Data Sheet. 2012b. PrinterEvolution AquaSub 33 Ink Cyan. Louisville (CO): Printer Evolution. [accessed 2019 May 6].

[MSDS] Material Safety Data Sheet. 2013a. Concrete Admixture products: MSDS No. SP205P. Oxford (NJ): Innovative Concrete Technology, LLC. [accessed 2019 May 1].

[MSDS] Material Safety Data Sheet. 2013b. Pavecure W. Melbourne (AU): Aitken Freeman Pty. Ltd. [accessed 2019 May 1].

[NCI] National Chemical Inventories [database on a CD-ROM]. 2015. Issue 2. Columbus (OH): American Chemical Society, Chemical Abstracts Service. [accessed 2017 July 27]

[NHPID] Natural Health Products Ingredients Database. 2023. [database on the internet]. Ottawa (ON): Health Canada. [accessed 2023 February 9].

[NICNAS] National Industrial Chemicals Notifications and Assessment Scheme. [Modified July 2018; accessed May 2019].

[OECD] Organisation for Economic Co-operation and Development. 2006a. SIDS Initial Assessment Profile (SIAP): Oxo alcohols C9 to C13 category. SIAM [SIDS Initial Assessment Meeting] 22; 2006 April 18-21; Paris (FR). [accessed 2020 Mar 04].

[OECD] Organisation for Economic Co-operation and Development. 2006b. SIDS initial assessment report: long chain alcohols category. Tome 1: SIAR. SIAM [SIDS Initial Assessment Meeting] 22; 2006 April 18-21; Paris (FR). [accessed 2022 Sep 26].

PubChem. 2019. Substance record 67891-82-1. , Bethesday (MD): U.S. National Library of Medicine [accessed 2019 Aug 8].

REEHUA Biotech Co. 2018. Hydrocarbon Resin (Petroleum Resin), C5 Resin, C9 Resin. Qingdao (CN). [accessed 2019 June 7].

Roberts S. 2015. Clean, Don’t Dump. A little effort to recycle metalworking fluids pays off big. Canadian Industrial Machinery. [accessed 2021 September 28].

Rossrucker T, Horstmann S, Fessenbecker A. 2017. Sulfur Carriers. In: Rudnick LR, editor. Lubricant Additives: Chemistry and Applications, 3rd edition. Boca Raton (FL): CRC Press.

[SDS] Safety Data Sheet. 2015a. BEMOL #2 LX Moli-Grease. West Hartford (CT): Rose Mill Company. [accessed 2019 May 13].

[SDS] Safety Data Sheet. 2015b. NEVTAC® 201 Resin. Pittsburgh (PA): Neville Chemical Company.

[SDS] Safety Data Sheet. 2016a. Kendex® 0840. Bradfor, (PA): American Refining Group, Inc.

[SDS] Safety Data Sheet. 2016b. LePage® PL200® Construction Adhesive. Mississauga (ON): Henkel Canada Corp. [accessed 2019 May 13].

[SDS] Safety Data Sheet. 2016c. LX® 2181 Resin.Pittsburgh (PA): Neville Chemical Company. [accessed 2018 June 12].

[SDS] Safety Data Sheet. 2016d. HIKOTAC P-90. Gwacheon (KR) Kolon Industries. [accessed 2019 May 13].

[SimpleTreat version 3.1] Sewage Treatment Plant Removal Model version 3.1. 2003. Bilthoven (NL): National Institute for Public Health and the Environment (RIVM). Available from: National Institute for Public Health and the Environment (RIVM), Laboratory for Ecological Risk Assessment, Bilthoven, the Netherlands.

[US EPA] United States Environmental Protection Agency. 2011a. Asphalt category analysis and hazard characterization. Washington (DC): US EPA. [accessed 2018 June 4].

[US EPA] United States Environmental Protection Agency. 2011b. Screening-level hazard characterization: Asphalt category. Washington (DC). [accessed 2018 June 4].

[US EPA] Environmental Protection Agency. 2011c. Federal Register Vol. 76, No. 204. USA.

[US EPA] Environmental Protection Agency. 2019a. Substance Registry Services. High boiling hydroformylation products of C6-10 alkenes. Washington (DC): US EPA. [accessed 2020 Feb. 18].

[US EPA] Environmental Protection Agency. 2019b. Substance Registry Services. Distillates (petroleum), steam-cracked polymd. Washington (DC): US EPA. [accessed 2020 Mar. 30].

[US EPA] Environmental Protection Agency. 2019c. Substance Registry Services. Distillates (petroleum), steam-cracked C5-12 fraction polymd. Washington (DC): US EPA. [accessed 2020 Mar. 30].

[US EPA] Environmental Protection Agency. 2020. TSCA Chemical Substance Inventory. Washington, DC. [accessed 2020 Mar. 23].

Zohuriaan-Mehr MJ, Omidian H. 2000. Petroleum Resins: An Overview. J. Macromol. Sci. Part C: Polymer Rev. 40: 23-49.

Appendix A. Hydrocarbon-based substances for which risk assessment activities have already taken place under CEPA

Table A-1 Thirty-five hydrocarbon-based substances which fall under previous risk assessments

CAS RN	DSL name
64741-46-4[a]	Naphtha (petroleum), light straight run
64741-63-5[a]	SIDS Naphtha (petroleum), light catalytic reformed
64741-72-6[a]	Naphtha (petroleum), polymn.
64741-83-9[a]	Naphtha (petroleum), heavy thermal cracked
64741-99-7[a]	Extracts (petroleum), light naphtha solvent
67891-79-6[a]	Distillates (petroleum), heavy arom.
68131-49-7[a]	Aromatic hydrocarbons, C6-10, acid-treated, neutralized
68410-98-0[a]	Distillates (petroleum), hydrotreated heavy naphtha, deisohexanizer overheads
68425-35-4[a]	Raffinates (petroleum), reformer, Lurgi unit-sepd.
368475-70-7[a]	Aromatic hydrocarbons, C6-8, naphtha-raffinate pyrolyzate-derived
68475-79-6[a]	Distillates (petroleum), catalytic reformed depentanizer
68476-47-1[a]	Hydrocarbons, C2-6, C6-8 catalytic reformer
68476-55-1[a]	Hydrocarbons, C5-rich
68477-63-4[a]	Extracts (petroleum), reformer recycle
68478-15-9[a]	Residues (petroleum), C6-8 catalytic reformer
68513-63-3[a]	Distillates (petroleum), catalytic reformed straight-run naphtha overheads
68516-20-1[a]	Naphtha (petroleum), steam-cracked middle arom.
68527-21-9[a]	Naphtha (petroleum), clay-treated full-range straight-run
68527-22-0[a]	Naphtha (petroleum), clay-treated light straight-run
68603-00-9 [a]	Distillates (petroleum), thermal cracked naphtha and gas oil
68783-11-9[a]	Naphtha (petroleum), light polymn.
68783-66-4[a]	Naphtha (petroleum), light, sweetened
68919-15-3[a]	Hydrocarbons, C6-12, benzene-recovery
68921-08-4 [a]	Distillates (petroleum), light straight-run gasoline fractionation stabilizer overheads
92045-52-8[a]	Naphtha (petroleum), hydrodesulfurized full-range
92045-60-8[a]	Naphtha (petroleum), light, C5-rich, sweetened
128683-32-9[a]	Naphtha (oil sand)
128683-33-0[a]	Naphtha (oil sand), hydrotreated
128683-34-1[a]	Naphtha (oil sand), light straight-run
129893-11-4[a]	Residues (petroleum), vacuum, hydrocracked, naphtha fraction
139730-55-5[a]	Naphtha (petroleum), hydrotreated light, catalytic reformed
8006-14-2[b,c]	Natural gas

CAS RN	DSL name
68410-63-9 [b,c]	Natural gas, dried
61789-60-4 [d]	Pitch
65996-78-3 [b,d]	Light oil (coal), coke-oven

[a] This substance is considered to have been previously assessed under the Site-Restricted LBPNs Screening Assessment and/or the Industry-Restricted LBPNs Screening Assessment (Environment Canada, Health Canada 2011, 2013a).

[b] This substance was prioritized through other mechanisms (ECCC, HC [modified 2017]).

[c] This substance is considered to have been previously assessed under the Liquefied Petroleum Gases assessment (ECCC, HC 2016a).

[d] This substance is considered to have been previously assessed under the Coal Tars and their Distillates screening assessment (ECCC, HC 2021a).