# Chemicals Management Plan Approach for a Subset of Inorganic and Organometallic Substances

**Environment and Climate Change Canada**
**Health Canada**

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# 1. Introduction

As a part of the Chemicals Management Plan (CMP), the Government of Canada assesses and manages, where appropriate, the potential health and ecological risks associated with substances prioritized for action under the Canadian Environmental Protection Act, 1999 (CEPA) (Canada 1999). The substances in this document were identified as priorities for assessment as they met categorization criteria under subsection 73(1) of CEPA, were considered a priority on the basis of other human health concerns (ECCC, HC [modified 2017]), or were identified for further consideration following prioritization of the Revised In Commerce List (R-ICL)[1] (Health Canada [modified 2017]).

This document identifies 59 prioritized substances—including both individual substances and groups of substances and moieties[2]—for which risk assessment activities can be considered as having already taken place under CEPA. Some of the individual substances on the Domestic Substances List (DSL) that were identified through the categorization process, as well as a number of substances on the R-ICL that were prioritized for further consideration, were found to fall within the scope of substances, groups of substances or moieties previously addressed.

Accordingly, the 59 substances will not undergo further assessment at this time. This approach will enable Environment and Climate Change Canada and Health Canada to focus their assessment activities on prioritized substances that have not yet been addressed.

Additional assessment or management activities may be undertaken if new health effects or exposure information that may impact previous decisions becomes available. This information may be identified through international activities, further information gathering activities, or the results of risk management activities, including performance evaluation.

This approach aligns with two previous similar activities. The first, the “Final Approach for a Subset of Substances Prioritized during Categorization That Have Already Been Addressed” (ECCC 2015), determined that 248 substances on the DSL were

[1] The Revised In Commerce List (R-ICL) is a list of substances that are known to have been authorized for use in commerce in Canada between 1987 and 2001. As the substances are present in Canada, the government is addressing them for potential impact on human health and the environment, in order to risk-manage the substances if required.

[2] For the purpose of this document, “moiety” signifies a part of a molecule. A moiety is a discrete chemical entity, identified from a parent compound or its transformation products, that is expected to have toxicological significance.

considered to fall within the scope of other initiatives under CEPA and, as a result, were identified as not requiring further assessment at that time. The second was the recently published “Approach for a Subset of Petroleum Substances Prioritized During Categorization” (ECCC, HC 2017), which identified 83 petroleum substances on the DSL as not requiring further assessment at that time.

# 2. Analysis

An analysis was undertaken to determine which of the substances previously identified as priorities are associated with other assessment initiatives under CEPA. The scope of the analysis included substances and moieties that had been addressed by a first Priority Substances List (PSL1) assessment or a second Priority Substances List (PSL2) assessment, as well as substances already on Schedule 1 of CEPA. In addition, Health Canada has undertaken human health risk assessments for several substances, and the Federal-Provincial-Territorial Committee on Drinking Water (CDW) established and published Guidelines for Canadian Drinking Water Quality under section 55 of CEPA. These guidelines were considered, when available. Substances found to have been addressed under previous assessment activities will not undergo further assessment activity at this time.

## 2.1 Substances from the first priority substances list

The first Priority Substances List (PSL1) was published in 1989 and included 44 substances or groups of substances. Ecological and human health risk assessments were completed by early 1994 as part of the Priority Substances Assessment Program (ECCC [modified 2013a]).

### 2.1.1 Arsenic

The PSL1 assessment of “Arsenic and its compounds” focused on arsenic and its inorganic compounds (EC, HC 1993a). Additionally, the CDW has established a drinking water guideline for arsenic (Health Canada 2017a).

One arsenic-containing substance identified as a priority during categorization (CAS RN 58-36-6, 10H-phenoxarsine, 10,10’-oxybis-) is considered within the scope of the PSL1 assessment of “Arsenic and its compounds” and will therefore not undergo further assessment at this time.

### 2.1.2 Cadmium

The PSL1 assessment of “Cadmium and its compounds” focused on inorganic cadmium compounds (EC, HC 1994a). Additionally, the CDW has established a drinking water guideline for cadmium (Health Canada 2017a).

One cadmium-containing substance identified as a priority during categorization (CAS RN 2420-98-6, hexanoic acid, 2-ethyl-, cadmium salt) is considered within the scope of the PSL1 assessment of “Cadmium and its compounds” and will therefore not undergo further assessment at this time.

### 2.1.3 Chromium

The PSL1 assessment of “Chromium and its compounds” focused on the inorganic form, salts and organometallic species of chromium (EC, HC 1994b). Additionally, the CDW has established a drinking water guideline for chromium (Health Canada 2016).

The 11 chromium compounds listed in Table 1 are considered within the scope of the PSL1 assessment of “Chromium and it compounds” and will therefore not undergo further assessment at this time.

**Table 1. Eleven chromium-containing substances which fall within the scope of the PSL1 assessment**

| CAS RN | DSL or R-ICL Name | Inventory |
|---|---|---|
| 12001-99-9 | C.I. Pigment Green 18 | DSL |
| 12018-01-8 | Chromium oxide ($CrO_2$) | R-ICL |
| 14639-25-9 | 2-Pyridinecarboxylic acid, chromium(3+) salt (3:1) | R-ICL |
| 39322-04-8 | Chromium potassium oxide | R-ICL |
| 57072-40-9 | 1,2,3-Propanetricarboxylic acid, 2-hydroxy-, chromium(3+) salt (1:?). | R-ICL |
| 68187-12-2 | C.I. Pigment Red 233 | DSL |
| 68891-97-4 | Chromium, diaquatetrachloro[μ-[N-ethyl-N-[(pentadecafluoroheptyl)sulfonyl]glycinato-O1:O1’]]-μ-hydroxybis(2-propanol)- | DSL |
| 68891-98-5 | Chromium, diaquatetrachloro[μ-[N-ethyl-N-[(tridecafluorohexyl)sulfonyl]glycinato-O1:O1’]]-μ-hydroxybis(2-propanol)di- | DSL |
| 68891-99-6 | Chromium, diaquatetrachloro[μ-[N-ethyl-N-[(undecafluoropentyl)sulfonyl]glycinato-O1:O1’]]-μ-hydroxybis(2-propanol)di- | DSL |
| 68900-97-0 | Chromium, diaquatetrachloro[μ-[N-ethyl-N-[(nonafluorobutyl)sulfonyl]glycinato-O1:O1’]]-μ-hydroxybis(2-propanol)di- | DSL |
| CDSL#12208-4 | Silica gel, reaction product with chromic acid, bis(triphenylsilyl) ester and metal alkalkoxide | DSL |

### 2.1.4 Inorganic fluorides

The PSL1 assessment of “Inorganic Fluorides” focused on inorganic fluoride compounds (EC, HC 1993b). Additionally, the CDW has established a drinking water guideline for fluoride (Health Canada 2017a).

The two fluoride compounds listed in Table 2 are considered within the scope of the PSL1 assessment of “Inorganic Fluorides” and will therefore not undergo further assessment at this time.

**Table 2: Two inorganic fluoride substances which fall within the scope of the PSL1 assessment**

| CAS RN | DSL or R-ICL Name | Inventory |
|---|---|---|
| 16893-85-9 | Silicate(2-), hexafluoro-, disodium | DSL |
| 39456-59-2 | Phosphoric acid, mixt. with sodium fluoride (NaF) | R-ICL |

### 2.1.5 Nickel

The PSL1 assessment of “Nickel and its compounds” focused on nickel and its inorganic compounds (EC, HC 1994c).

The four nickel compounds listed in Table 3 are considered within the scope of the PSL1 assessment of “Nickel and it compounds” and will therefore not undergo further assessment at this time.

**Table 3. Four nickel-containing substances which fall within the scope of the PSL1 assessment**

| CAS RN | DSL or R-ICL Name | Inventory |
|---|---|---|
| 12122-15-5 | Nickel carbonate hydroxide (Ni5(CO3)2(OH)6) | R-ICL |
| 13927-77-0 | Nickel, bis(dibutylcarbamodithioato-S,S’)-, (SP-4-1)-) | DSL |
| 65405-96-1 | Nickel, [μ-[carbonato(2-)-κO:κO']]dihydroxydi- | R-ICL |
| 142164-39-4 | Nickel carbonate hydroxide | R-ICL |

## 2.2 Substances from the second priority substances list

The second Priority Substances List (PSL2) was published in December 1995 (ECCC [modified 2013b]). The list, recommended by a Ministers’ Expert Advisory Panel drawn from major stakeholder groups and accepted by the Ministers, contained 25 substances, including single chemicals as well as mixtures and effluents.

### 2.2.1 Ammonia

The PSL2 assessment of “Ammonia in the aquatic environment” focused on the effects of ammonia on the environment, including the terrestrial environment, as well as the effects of ammonia in air and water on human health (EC, HC 2001). Additionally, the CDW has established a drinking water guideline for ammonia (Health Canada 2017a).

The 26 ammonia-containing substances listed in Table 4 are considered within the scope of the PSL2 assessment of “Ammonia in the aquatic environment” and will therefore not undergo further assessment at this time.

**Table 4. Twenty-six ammonia-containing substances on the DSL which fall within the scope of the PSL2 assessment**

| CAS RN | DSL Name |
|---|---|
| 506-87-6 | Carbonic acid, diammonium salt |
| 1066-33-7 | Carbonic acid, monoammonium salt |
| 1341-49-7 | Ammonium fluoride ($(NH_4)(HF_2)$) |
| 1762-95-4 | Thiocyanic acid, ammonium salt |
| 6484-52-2 | Nitric acid ammonium salt |
| 7722-76-1 | Phosphoric acid, monoammonium salt |
| 7727-54-0 | Peroxydisulfuric acid ($[(HO)S(O)_2]_2O_2$), diammonium salt |
| 7773-06-0 | Sulfamic acid, monoammonium salt |
| 7783-18-8 | Thiosulfuric acid ($H_2S_2O_3$), diammonium salt |
| 7783-20-2 | Sulfuric acid diammonium salt |
| 7783-28-0 | Phosphoric acid, diammonium salt |
| 7803-55-6 | Vanadate ($VO_3^{1-}$), ammonium |
| 8000-73-5 | Carbonic acid, monoammonium salt, mixt. with carbamic acid monoammonium salt |
| 10039-54-0 | Hydroxylamine, sulfate (2:1) (salt) |
| 10124-31-9 | Phosphoric acid, ammonium salt |
| 10192-30-0 | Sulfurous acid, monoammonium salt |
| 10196-04-0 | Sulfurous acid, diammonium salt |
| 10361-29-2 | Carbonic acid, ammonium salt |
| 12125-01-8 | Ammonium fluoride ($(NH_4)F$) |
| 12125-02-9 | Ammonium chloride ($(NH_4)Cl$) |
| 12135-76-1 | Ammonium sulfide ($(NH_4)2S$) |
| 12259-92-6 | Ammonium sulfide ($(NH_4)_2(S_3)$) |
| 13863-45-1 | Sulfuric acid, ammonium sodium salt |
| 14221-47-7 | Ferrate(3-), tris[ethanedioato(2-)-O,O’]-, triammonium, (OC-6-11)- |
| 27546-07-2 | Molybdate ($Mo_2O_7^{2-}$), diammonium |
| 68309-95-5 | Zirconate(2-), bis[carbonato(2-)-O]dihydroxy-, diammonium, (T-4)- |

### 2.2.2 Uranium

The PSL2 assessment of “Releases of radionuclides from nuclear facilities (impact on non-human biota)” focused on uranium and uranium compounds with respect to non-human biota (EC [modified 2013b]). Food and water represent the main sources of exposure to uranium, but the contribution from these sources can be highly variable. In the case of Canadian drinking water, uranium content can vary greatly depending on geological formations and anthropogenic activities surrounding the source water. Health Canada has undertaken a human health risk assessment for uranium based on its chemical properties with the intent of updating the current drinking water guideline (Health Canada 2017b).

The four uranium-containing substances listed in Table 5 are considered within the scope of the PSL2 assessment of “Releases of radionuclides from nuclear facilities (impact on non-human biota)” and the Guideline Technical Document for the uranium drinking water guideline and will therefore not undergo further assessment at this time.

**Table 5. Four uranium-containing substances which fall within the scope of the PSL2 assessment**

| CAS RN | DSL or R-ICL Name | Inventory |
|---|---|---|
| 1344-57-6 | Uranium oxide ($UO_2$) | DSL |
| 7783-81-5 | Uranium fluoride ($UF_6$) | DSL |
| 11108-73-9 | Uranium alloy, base, U,Nb,Zr (Mulberry) | R-ICL |
| 15905-86-9 | Nitric acid, uranium salt | R-ICL |

## 2.3 Substances listed on Schedule 1

A number of substances prioritized during categorization also appear on the List of Toxic Substances in Schedule 1 of CEPA (ECCC [modified 2017a]).

### 2.3.1 Lead

Lead is listed on the List of Toxic Substances in Schedule 1 of CEPA (ECCC [modified 2017b]; ECCC [modified 2014a]). Health Canada published a Final Human Health State of the Science Report on Lead (SOS) and a Risk Management Strategy for Lead (RMS) in February 2013 (Health Canada 2013a, b).

These reports address exposures to total lead and provide a comprehensive description of the existing management measures and progress to date under the Canadian Federal Risk Management Strategy for Lead. While many of these actions were triggered primarily by human health concerns, they have led to substantial reductions in releases to the environment (as confirmed by National Pollutant Release Inventory reporting and by environmental monitoring), thereby reducing potential environmental concerns. Research and monitoring continues to measure lead levels in Canadians and,

where appropriate, assess the performance of potential control measures identified during the risk management phase. In addition, Health Canada has undertaken a human health risk assessment for lead with the intent of updating the current drinking water guideline for lead (Health Canada 2017c).

Six lead substances were identified during prioritization of the R-ICL. Additionally, the two statutory mixtures listed in Table 6 (65997-19-5 and 66402-68-4) were assumed to include lead compounds for the purposes of categorization. The eight lead compounds will therefore not undergo further assessment at this time.

**Table 6. Lead-containing compounds which fall within the scope of the lead SOS and RMS**

| CAS RN | DSL or R-ICL Name | Inventory |
|---|---|---|
| 7446-27-7 | Phosphoric acid, lead(2+) salt (2:3) | R-ICL |
| 10101-63-0 | Lead iodide (PbI2) | R-ICL |
| 12684-19-4 | Lead iodide | R-ICL |
| 13779-98-1 | Plumbane, tetraiodo- | R-ICL |
| 16040-38-3 | Phosphoric acid, lead salt | R-ICL |
| 65997-19-5 | Steel manufacture, chemicals | DSL |
| 66402-68-4 | Ceramic materials and wares, chemicals | DSL |
| 79120-33-5 | Litharge (PbO) | R-ICL |

### 2.3.2 Mercury

“Mercury and its compounds” are on the List of Toxic Substances in Schedule 1 of CEPA 1999 (ECCC [modified 2017b]; ECCC [modified 2014b]). Environment Canada and Health Canada published a Risk Management Strategy for Mercury (RMS) in October 2010, covering all forms of mercury (EC, HC 2010). The listing on Schedule 1 was modified in 2012, from “Mercury” to “Mercury and its compounds” (Canada 2012). Additionally, a drinking water guideline for mercury has been established (Health Canada 2017a). The two substances listed in Table 7 are identified as mercury or mercury compounds and are covered under the Schedule 1 listing. There is also a clear association between these two substances, the Schedule 1 listing and the associated risk management actions. These two mercury compounds will therefore not undergo further assessment at this time.

**Table 7. Mercury compounds for which no further assessment is proposed at this time**

| CAS RN | DSL or R-ICL Name | Inventory |
|---|---|---|
| 94-43-9 | Mercury, (benzoato-O)phenyl- | R-ICL |
| 10124-48-8 | Mercury amide chloride ($Hg(NH_2)Cl$) | R-ICL |

## 3. Overall summary

The 59 substances in this document will not undergo further assessment at this time given that they are considered to be addressed by previous assessment activities.

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