ATLANTIC RBCA
ENVIRONMENTAL QUALITY STANDARDS

RATIONALE AND GUIDANCE
DOCUMENT

July 2021

Acknowledgements

The Rationale Document supercedes the Nova Scotia Environment (NSE) April 2014 ENVIRONMENTAL QUALITY STANDARDS FOR CONTAMINATED SITES - RATIONALE AND GUIDANCE DOCUMENT and provides an updated set of Environmental Quality Standards (EQS) intended for application throughout all four Atlantic Provinces.

The Rationale Document was prepared by Mr. Rob Willis (Dillon Consulting Limited) and Mr. John Henderson (Stantec Consulting Ltd.) under contract to Atlantic Partners in Risk Based Corrective Action (RBCA) Implementation (Atlantic PIRI).

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LIST OF ABBREVIATIONS AND ACRONYMS

AEP	Alberta Environment and Parks
ASTM	American Society for Testing and Materials
Atlantic PIRI	Atlantic Partnership in RBCA Implementation
BCMOECCS	British Columbia Ministry of Environment and Climate Change Strategies
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CASRN	Chemical Abstracts Service Registry Number
CCME	Canadian Council of Ministers of the Environment
CoC	Contaminant of Concern
CSQG	Canadian Soil Quality Guideline
CSR	Contaminated Sites Regulation
EqP	Equilibrium Partitioning
EQS	Environmental Quality Standard
ESL	Ecological Screening Level
HC	Health Canada
MOECC	Ontario Ministry of Environment and Climate Change
NOAA	National Oceanic and Atmospheric Administration
NSSAM	Numerical Standards and Site Assessment Methodologies Working Group
NSE	Nova Scotia Environment
OMOE	Ontario Ministry of the Environment
PEL	Probable Effect Level
PAH	Polycyclic Aromatic Hydrocarbon
PFAS	Per- and Polyfluoroalkyl Substances
PHC	Petroleum Hydrocarbons
PSS	Pathway-specific Standard
PSSL	Pathway-specific Screening Level
RBCA	Risk-Based Corrective Action
RBSL	Risk-Based Screening Level
RDL	Reportable Detection Limit
RSL	Regional Screening Level
SQG	Soil Quality Guideline
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound(s)

1.0 INTRODUCTION

Each of the four Atlantic Provinces (Nova Scotia, Prince Edward Island, New Brunswick and Newfoundland and Labrador) administer impacted sites assessment programs in accordance with applicable legislation, regulations and other regulatory instruments (including various protocols, policies and guidance documentation) that pertain to and/or describe the application and use of numerical standards within provincial impacted site assessment programs.

This document provides the reference information and rationale that was used to develop Tier I Environmental Quality Standards (EQS) and Tier II Pathway-Specific Standards (PSS) for the Atlantic Provinces.

The Atlantic RBCA Tier I EQS and Tier II PSS may be adopted in Ministerial Protocols and other relevant guidance and regulatory instruments developed by the four Atlantic Provinces. These Protocols and guidance describe the intended use and application of Atlantic RBCA EQS and PSS within the respective Atlantic Provinces. In general, the Atlantic RBCA EQS and PSS are the regulatory numerical standards used for the identification, assessment and remediation of impacted sites located within Nova Scotia, Prince Edward Island, New Brunswick and Newfoundland and Labrador.

It must be recognized that the Rationale Document presented herein is a supporting document to the respective impacted sites regulations, policies, protocols and other guidance within the four Atlantic Provinces and should be read in conjunction with these relevant regulatory instruments and tools. Any wording, information, or requirements contained in the relevant provincial impacted sites regulations, and other relevant regulatory instruments and tools, takes precedence over the information presented herein.

1.1 BACKGROUND AND HISTORY OF ATLANTIC REGION NUMERICAL STANDARDS

In 2009, NSE formed a Numerical Standards and Site Assessment Methodologies Working Group (NSSAM Working Group), which included several scientific experts, to advise NSE on the process of identifying and adopting numerical environmental quality standards to support impacted site regulations. The NSSAM Working Group completed significant research related to sources of existing environmental quality standards, relevant environmental media, and typical receptors/exposure pathways. Following the work and advice of the NSSAM working group, NSE commissioned a report in 2011 which formed a portion of the rationale and background for the 2014 NSE Rationale and Guidance document. Selected technical updates, text and policy direction were incorporated into the 2011 document by NSE, which culminated in the release of the 2014 NSE Rationale and Guidance document in April of 2014.

In 2017, the four Atlantic Provinces expressed interest in harmonizing the environmental quality standards used at impacted sites located within Atlantic Canada. This harmonization effort was led and coordinated by the Atlantic Partners in Risk-Based Corrective Action (RBCA) Implementation (Atlantic PIRI), on behalf of the four Atlantic Provinces.

As an initial step in the harmonization effort, Atlantic PIRI retained contractors who were involved with the original NSE EQS process, to review and update the current set of NSE EQS and PSS. This involved changes and updates to the 2014 NSE EQS and PSS (to ensure that the adopted Atlantic EQS and PSS values reflect more recent regulatory guideline values developed by the source agencies and departments), as well as to the 2014 NSE Rationale Document. The revision and update effort focused on the same environmental media, exposure pathways, receptor types, land use categories, groundwater use conditions and soil texture categories that were originally addressed in the 2014 NSE EQS and Rationale Document.

It is expected that the four Atlantic Provinces will independently determine how and when to apply and implement the EQS and PSS within their individual provincial impacted site management processes, programs, and policy frameworks. At the discretion of the individual Atlantic Provinces, this may include modifications to the Tier I EQS and Tier II PSS described herein.

1.2 OBJECTIVES

The objectives of this Rationale Document are as follows:

- To document the basis and rationale for the adoption of Atlantic RBCA EQS and PSS for application to impacted sites in the four Atlantic Provinces.

- To provide site professionals and others with an understanding of the hierarchy of jurisdictional sources used for Atlantic RBCA EQS and PSS adoption and to provide the regulatory sources of the adopted Tier I EQS and Tier II PSS values.

2.0 Development of Atlantic RBCA Environmental Quality Standards (EQS) and Pathway-Specific Standards (PSS)

The development of numerical Atlantic RBCA EQS and PSS for the identification, assessment, and remediation of impacted sites in Atlantic Canada is based on several important factors.

These factors include:

- The relevant or applicable environmental media at the site.
- The potential contaminants of concern (CoC) present in site media.
- The site land use classification and site use patterns.
- Site soil texture classification.
- Operable exposure pathways at the site.
- Human and ecological receptors present at the site.
- Site groundwater use conditions (potable versus non-potable).

A brief discussion of these factors follows.

2.1 APPLICABLE ENVIRONMENTAL MEDIA

The numerical Atlantic RBCA EQS and PSS have been developed for all relevant environmental media which are typically evaluated at impacted sites in Atlantic Canada.

These media are:

- Soil.
- Groundwater.
- Surface Water (freshwater and marine).
- Sediment (freshwater and marine).

2.2 POTENTIAL CONTAMINANTS OF CONCERN

A master list of potential contaminants of concern (CoC's), for all media of interest, was developed in consultation with representatives from each of the provincial regulatory agencies which administer and oversee impacted sites programs (i.e., Nova Scotia Environment, New Brunswick Department of Environment and Local Government, Prince Edward Island Department of Communities, Land and Environment, and Newfoundland and Labrador Department of Municipal Affairs and Environment), and with representatives of Atlantic PIRI. Atlantic region analytical laboratories were also consulted to verify that: i) they have the appropriate analytical capabilities, equipment and certifications for the parameters on the master list; and, ii) they can achieve appropriate RDLs for the listed parameters in the relevant media, such that the RDLs are below the selected EQS and PSS values. Analytical laboratory consultation also determined whether there is a need to revise or consider revising certain analytical groupings or packages. The resulting master list of CoC's is based on collective experience at impacted sites in Atlantic Canada and considers environmental quality guideline availability from both Canadian and U.S. jurisdictions.

The master list forms the basis for the compilation of EQS and PSS for use at impacted sites within the context of this Rationale Document, and in support of applicable impacted sites regulations and other regulatory instruments within the four Atlantic Provinces. This list of CoC's is not intended to be used as an analytical screening tool for potential triggers under applicable regulations. Rather, each site and situation warrant a specific evaluation and assessment to determine which, if any, of the potential CoC's may be present in site media.

The master list of CoC's is provided in **Table 2-1**, along with corresponding Chemical Abstracts Service Registry Numbers (CASRN), where available and applicable. The CASRN for each substance listed in **Table 2-1** is simply an identification number published by the Chemical Abstracts Service, a division of the American Chemical Society.

The individual Atlantic Provinces have the option to modify the master list of COC's, as deemed necessary and appropriate within their respective jurisdictions.

For consistency, the complete master list of CoC's is presented for the compiled Tier I EQS and Tier II PSS tables provided in **Appendix A**. These tables or similar tables may also be posted to websites that provide impacted sites program guidance and documentation for the four Atlantic Provinces. For some chemicals, exposure pathways or receptors indicated in the Tier I EQS or Tier II PSS tables, there may be no EQS or PSS value available. In such cases, the absence of an applicable guideline is indicated in the tables.

Table 2-1 Master List of Potential Contaminants of Concern

Master List of Potential Contaminants of Concern (CoC's)	
Inorganics	**CASRN**
Aluminum	7429-90-5
Antimony	7440-36-0
Arsenic	7440-38-2
Barium	7440-39-3
Beryllium	7440-41-7
Boron (total)	7440-42-8
Boron (hot water soluble)	7440-42-8
Cadmium	7440-43-9
Chromium (hexavalent)	18540-29-9
Chromium (total)	7440-47-3
Cobalt	7440-48-4
Copper	7440-50-8
Cyanide	57-12-5
Iron	7439-89-6
Lead	7439-92-1
Manganese	7439-96-5
Mercury (total)	7439-97-6
Methylmercury	22967-92-6
Molybdenum	7439-98-7
Nickel	7440-01-0
Selenium	7782-49-2
Silver	7440-22-4
Sodium	7440-23-5
Strontium	7440-24-6
Thallium	7440-28-0
Tin	7440-31-5
Uranium	7440-61-1
Vanadium	7440-62-2
Zinc	7440-66-6
Petroleum Hydrocarbons (PHC)	**CASRN**
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
Xylenes	Various
Modified Total Petroleum Hydrocarbons (Gasoline)	Various
Modified Total Petroleum Hydrocarbons (Fuel Oil)	Various
Modified Total Petroleum Hydrocarbons (Lube Oil)	Various
Methyl Tertiary Butyl Ether (MTBE)	1634-04-4
Polycyclic Aromatic Hydrocarbons (PAH)	**CASRN**
Naphthalene	91-20-3

Master List of Potential Contaminants of Concern (CoC's)	
1 – Methylnaphthalene	90-12-0
2 – Methylnaphthalene	91-57-6
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Fluoranthene	120-12-7
Fluorene	206-44-0
Phenanthrene	86-73-7
Pyrene	129-00-0
Benzo[a]pyrene (BaP) Total Potency Equivalents (Human Health – Carcinogenicity)	Various
Benz[a]anthracene	56-55-3
Benzo[a]pyrene	50-32-8
Benzo[b,j,k]fluoranthene isomers	205-99-2; 205-82-3; 207-08-9
Benzo[g,h,i]perylene	191-24-2
Chrysene	218-01-9
Dibenz[a.h]anthracene	53-70-3
Indeno[1,2,3-c,d]pyrene	193-39-5
Volatile Organic Compounds (VOC)	**CASRN**
Bromodichloromethane	75-27-4
Bromoform	75-25-2
Bromomethane	74-83-9
Carbon Tetrachloride (Tetrachloromethane)	56-23-5
Chlorobenzene	108-90-7
Chloroethane	75-00-3
Chloroform	67-66-3
Chloromethane	74-87-3
Dibromochloromethane	124-48-1
1,2-Dichlorobenzene	95-50-1
1,3-Dichlorobenzene	541-73-1
1,4-Dichlorobenzene	106-46-7
1,1-Dichloroethane	75-34-3
1,2-Dichloroethane	107-06-2
1,1-Dichloroethylene	75-35-4
cis-1,2-Dichloroethylene	156-59-2
trans-1,2-Dichloroethylene	156-60-5
1,2-Dichloropropane	78-87-5
1,3-Dichloropropene	10061-01-5
Ethylene Dibromide	106-93-4
Methylene Chloride (Dichloromethane)	75-09-2
Styrene	100-42-5
1,1,1,2-Tetrachloroethane	630-20-6
1,1,2,2-Tetrachloroethane	79-34-5
Tetrachloroethylene	127-18-4

Master List of Potential Contaminants of Concern (CoC's)	
1,1,1-Trichloroethane	71-55-6
1,1,2-Trichloroethane	79-00-5
Trichloroethylene	79-01-6
Vinyl Chloride	75-01-4
Pesticides	**CASRN**
Aldicarb	116-06-3
Aldrin	309-00-2
Atrazine	1912-24-9
Azinphos-methyl	86-50-0
Bendiocarb	22781-23-3
Bromoxynil	1689-84-5
Carbaryl	63-25-2
Carbofuran	1563-66-2
Chlorothalonil	1897-45-6
Chlorpyrifos	2921-88-2
Cyanazine	21725-46-2
2,4-D	94-75-7
DDT	50-29-3
Diazinon	333-41-5
Dicamba	1918-00-9
Dichlorfop-methyl	51338-27-3
Dieldrin	60-57-1
Dimethoate	60-51-5
Dinoseb	88-85-7
Diquat	85-00-7
Diuron	330-54-1
Endosulfan	115-29-7
Endrin	72-20-8
Glyphosate	1071-83-6
Heptachlor	76-44-8
Lindane	58-89-9
Linuron	330-55-2
Malathion	121-75-5
MCPA	94-74-6
Methoxychlor	72-43-5
Metolachlor	51218-45-2
Metribuzin	21087-64-9
Paraquat	4685-14-7
Parathion	56-38-2
Phorate	298-02-2
Picloram	1918-02-1
Simazine	122-34-9
Tebuthiuron	34014-18-1
Terbufos	13071-79-9

Master List of Potential Contaminants of Concern (CoC's)	
Toxaphene	8001-35-2
Triallate	2303-17-5
Trifluralin	1582-09-8
Per- and Polyfluoroalkyl Substances (PFAS)	**CASRN**
Perfluorooctane sulfonate (PFOS)	45298-90-6
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorobutanoate (PFBA)	375-22-4
Perfluorobutanesulfonate (PFBS)	45187-15-3
Perfluorohexanesulfonate (PFHxS)	108427-53-8
Perfluoropentanoate (PFPeA)	2706-90-3
Perfluorohexanoate (PFHxA)	307-24-4
Perfluoroheptanoate (PFHpA)	20109-59-5
Perfluorononanoate (PFNA)	375-95-1
Other Parameters	**CASRN**
Polychlorinated Biphenyls (Total PCB)	Various
Dioxins and Furans (TEQ)	Various
Pentachlorophenol (PCP)	87-86-5
Organotins – Tributyltin	688-73-3
Ethylene Glycol	107-21-1
Propylene Glycol	57-55-6
Phenol	108-95-2
Chloride	16887-00-6

Notes: CASRN is a Registered Trademark of the American Chemical Society.
"*Various*" indicates that a CASRN is not applicable as the parameter is a variable mixture of individual substances.

2.3 LAND USE CLASSIFICATIONS

The exposure frequency, duration, and intensity for human and ecological receptors at an impacted site are related to the nature of the land use, the activities inherent to that land use and the ease of access to site media (CCME, 2006). Therefore, land use is an important factor in the assessment and remediation of impacted sites.

The Canadian Council of Ministers of the Environment (CCME) uses four land use categories in the development of generic Canadian Soil Quality Guidelines (CSQG).

The four CCME land use categories are as follows:

- Agricultural.
- Residential/Parkland.
- Commercial.
- Industrial.

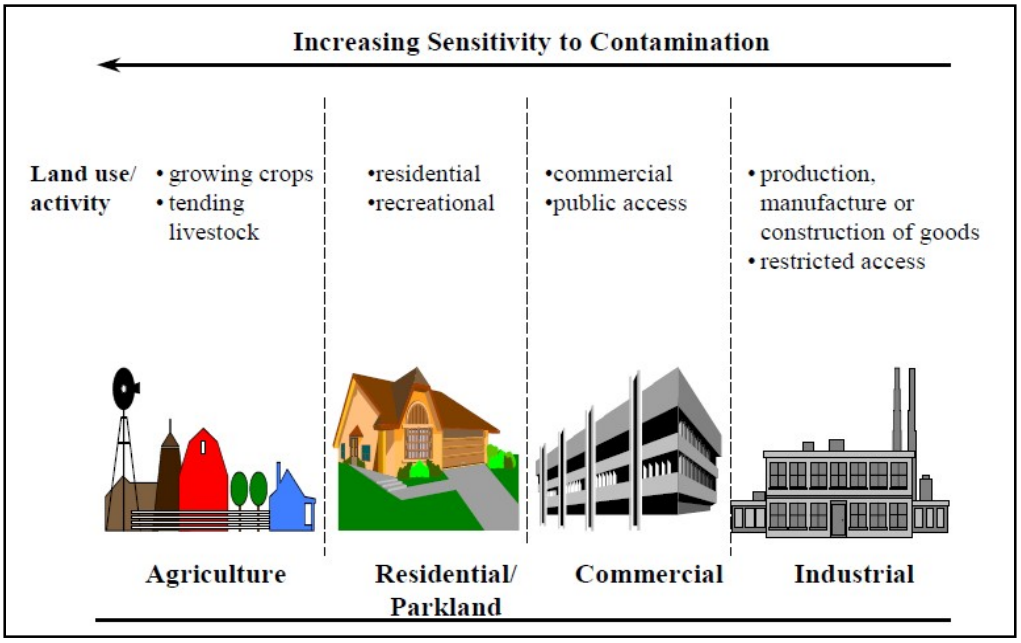
These four land use classifications are adopted herein with respect to the development of Tier I EQS and Tier II PSS. In general, when applying the Tier I EQS and/or Tier II PSS, the land use category that is most

consistent with, or applicable to, the current site land use and activities (and/or future land use where applicable) must be considered.

It should be noted that not all environmental media, receptors or exposure pathways of interest are necessarily included within each of the specific land use categories. This reflects regulatory guideline derivation approaches and history within the source jurisdictions, as well as practical considerations regarding the operability or significance of certain exposure pathways, and/or presence of certain receptors.

Potential sensitivity to contamination increases among ecological and human receptors as a function of the land use/activities, as shown in **Figure 2-1** below.

Figure 2-1 Sensitivity to Contamination by Land Use/Activity (from CCME, 2006)



The CCME definition for each land use category incorporates generic conditions and places boundaries on the receptors and exposure pathways considered in the derivation of guideline values for a given land use. Details of the receptor characteristics and exposure assumptions for each land use category are provided in CCME (2006).

The four CCME land use categories are briefly described below.

2.3.1 Agricultural

The primary land use/activity is growing crops or tending livestock. This category also includes agricultural lands that provide habitat for resident and transitory wildlife and native flora. Agricultural land encompasses a wide range of activities including dairy, livestock and/or crop production. Most farms include a homestead; therefore, the possible presence of an on-site residence (like those for residential/parkland sites specified below) is also considered. Agricultural lands are generally accessible by the farmer and family members, including children, who represent the more sensitive human receptor category.

2.3.2 Residential/Parkland

The primary land use/activity for this classification is residential occupancy or recreational activity. This category assumes parkland can be a buffer between areas of human residency and includes campgrounds, but does not include undeveloped wildlands, such as national or provincial parks.

The generic residential property assumed for this land use category is a typical detached single-family home with a backyard, where young children, particularly toddlers, are presumed to play outdoors. Recreational parks where children play, and where other family activities may also occur, are included in this land use category. In addition, long term care institutional facilities may also be considered as residential land use depending on the site-specific circumstances.

2.3.3 Commercial

The primary land use/activity is commercial (e.g., shopping malls and offices). Commercial land use properties span a wide variety of activities with varying degrees of access for human and ecological receptors. For the purposes of deriving environmental quality guidelines, it is commonly assumed that a generic commercial property may contain a day care facility; however, this land-use category may also include schools, hospitals, and religious facilities. Operations where food is grown would generally be excluded from this category.

2.3.4 Industrial

The primary land uses/activities involve the production, storage or distribution of goods. Industrial properties may span a wide variety of activities but generally do not permit direct public access. Typically, only workers would be present. Thus, children would not be expected to access industrial properties to any significant extent. Access to industrial properties is often limited for ecological receptors as well, due primarily to the lack of habitat or impaired habitat at industrial sites.

2.3.5 Natural or Wildlands Areas

For undeveloped, wild lands or natural area land uses, there is no CCME land use category currently. Thus, each province may establish policy or guidance as to which of the existing CCME land use categories best applies for the protection of undeveloped, wild, or natural land uses within their jurisdiction. Precedents within Canada exist for setting environmental quality guidelines for natural areas. For example, Alberta Environment and Parks (AEP, 2019) has established a natural areas land use category. AEP (2019) defines natural areas as those being away from human habitation and activities, where the primary concern is protection of ecological receptors. Human exposure pathways are not typically considered for natural areas unless the natural area of interest is underlain by a potable groundwater supply that may be used as a drinking water

source. In Alberta, parameter guideline values are typically adopted from the residential/parkland land use category, but there are some exceptions based on potentially operable exposure pathways within a natural area. For example, if natural areas may be used for livestock grazing, AEP (2019) requires consideration of livestock soil ingestion and the protection of groundwater for livestock water-related exposure pathways.

2.4 SOIL TEXTURE CLASSIFICATION

For some types of land use and some chemical parameters, regulatory agencies have developed separate soil and/or groundwater quality guidelines based on coarse-grained or fine-grained soil texture. Soil texture should be considered when conducting site assessments, in accordance with applicable impacted site regulations and protocols. Generally, EQS and PSS for coarse grained soil are lower values than EQS and PSS for fine-grained soil, though not always. The selection of EQS or PSS for fine grained soil should be supported with data from a sieve analysis from an appropriate soil horizon that is believed to be impacted and is the focus of site assessment activities. The coarse and fine soil texture categories are defined according to ASTM (2011) as follows.

2.4.1 Fine-grained Soil

A fine-grained soil is defined as material having greater than 50% (by dry weight) of particles equal to or less than 75 microns (200 mesh) in diameter.

2.4.2 Coarse-grained Soil

A coarse-grained soil is defined as material having greater than 50% (by dry weight) of particles greater than 75 microns (200 mesh) in diameter.

2.5 EXPOSURE PATHWAYS

CCME (and other regulatory agencies) provide environmental quality guidelines which consider the common range of potential exposure pathways that are operable at most impacted sites.

The exposure pathways considered for the purpose of EQS and PSS development are summarized below (**Tables 2-2 and 2-3**). Should other relevant exposure pathways be deemed operable at a given site that are not captured by the exposure pathways addressed herein, a more detailed Tier II or Tier III site-specific evaluation may be warranted. This may involve the use of numerical guidelines for specific pathways that have been derived by jurisdictions other than those considered herein (Tier II), the development of site-specific guidelines for a given pathway (Tier II or III), or the use of site-specific risk assessment approaches (Tier II or III). More information on Tier II PSS and a discussion of Tier II and III site-specific approaches is provided in **Section 6.2**.

2.5.1 Human Exposure Pathways

Table 2-2 presents the human exposure pathways that were considered in the selection of EQS and PSS.

Table 2-2 Applicable Human Exposure Pathways

Media	Exposure Pathways
Soil	• Direct Contact (ingestion and/or dermal contact) • Vapour Migration from Soil to Indoor Air (inhalation of soil vapour in indoor air) • Dust Inhalation (inhalation of soil or dust particles in outdoor/indoor air) • Soil Leaching for Protection of Potable Groundwater (groundwater ingestion, as may be applicable) • Off-site Migration (for commercial and industrial sites only)
Sediment	• May be evaluated in a similar manner as soil under certain conditions (See **Section 3.3.1**)
Surface Water	• Ingestion (as drinking water or from incidental water ingestion, as may be applicable)
Groundwater	• Ingestion as Drinking Water (as may be applicable) • Vapour Migration to Indoor Air (inhalation of vapours in indoor air)

2.5.2 Ecological Exposure Pathways

Table 2-3 presents the ecological exposure pathways (along with the target ecological receptor groups for each pathway) that were considered in the selection of EQS and PSS.

Table 2-3 Applicable Ecological Exposure Pathways

Media	Exposure Pathway (Receptor Group)
Soil	• Direct Soil Contact (plants and soil invertebrates) • Soil and Food Ingestion (livestock and/or wildlife)
Sediment	• Direct Contact with Sediments (freshwater and marine benthic aquatic life)[a]
Surface Water	• Direct Contact with Surface Water (freshwater and marine pelagic aquatic life)[b]
Groundwater	• Migration of Groundwater Contaminants to Surface Water (freshwater and marine pelagic aquatic life)[c]

Notes:

a) Includes direct contact of gills and other respiratory surfaces with sediments; ingestion of sediment (including sediment pore water ingestion); ingestion of aquatic prey species and other food items (e.g., detritus, plants, phytoplankton, zooplankton, macroinvertebrate fauna, and fish); and root contact with sediment for aquatic plants.
b) Includes direct contact of gills and other respiratory surfaces with water; ingestion of water; ingestion of aquatic prey species and other food items (e.g., detritus, plants, phytoplankton, zooplankton, macroinvertebrate fauna, and fish); and foliar contact with water for aquatic plants.
c) Includes migration to a freshwater or marine surface water body such that aquatic organisms may become exposed to what was originally a groundwater contaminant.

2.5.3 Human and Ecological Receptors

The human and ecological receptors that were considered in the selection of the EQS and PSS are generally the same default receptor types used by CCME and the other consulted jurisdictions.

2.5.4 Groundwater Use Conditions

The selection of both EQS and PSS for soil and groundwater considers whether a groundwater resource is potable (i.e., used for drinking water or other domestic purposes) or is non-potable. Thus, soil and groundwater EQS and PSS have been determined for both potable and non-potable groundwater use conditions. The Atlantic Provinces may develop specific guidance for the purposes of regulating groundwater use at impacted sites.

2.6 GENERAL HIERARCHY OF IMPACTED SITES GUIDELINES SOURCE JURISDICTIONS

During the numerical environmental quality standards process that led to the NSE EQS, PSS and Rationale Document in 2014, it was determined that a range of appropriate guidelines are available from CCME and other Canadian and international jurisdictions, and that *de novo* derivation or development of specific provincial standards was not warranted. This is considered to remain the case at present. Consequently, all EQS and PSS values are adopted values that have been derived by CCME and other regulatory authorities in Canadian or international jurisdictions.

General preference was given to CCME environmental quality guidelines where they exist. For petroleum hydrocarbon and chlorinated VOC EQS and PSS values, preference was given to the criteria developed by the Atlantic Partnership in Risk Based Corrective Action (Atlantic PIRI). In the absence of CCME or PIRI guidelines for a given CoC, guidelines or other types of benchmarks from other Canadian or international regulatory authorities were identified and adopted, if deemed appropriate and scientifically defensible. The general hierarchy used to select EQS and PSS is outlined below:

General Hierarchy:

1. Atlantic RBCA Version 4.0 (Atlantic PIRI, 2021) RBSLs, PSSLs and ESLs (for BTEX, PHCs, and selected chlorinated VOCs).

2. Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (http://ceqg-rcqe.ccme.ca/en/index.html)[1].
3. Federal Environmental Quality Guidelines (e.g., https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html).
4. As necessary, other Canadian jurisdictions (i.e., Alberta, British Columbia, Ontario) in specified orders of preference.
5. As necessary, United States Environmental Protection Agency (USEPA).
6. As necessary, select other U.S. and international jurisdictions.

If an environmental quality guideline for a particular CoC, pathway or receptor type was not available from the initial preferred jurisdiction, the next preferred jurisdiction(s) in the hierarchy was (were) then consulted until an appropriate environmental quality guideline could be identified and adopted (if the guideline value was deemed scientifically defensible). There were some deviations from the above hierarchy if the available guideline values from a source higher in the hierarchy were considered inappropriate or of weaker scientific basis relative to guidelines available from the other jurisdictions that were considered. For some CoC's however, no known regulatory authority has established environmental quality guidelines for certain environmental media, pathways, or receptor types. Thus, there are some CoC's which lack EQS or PSS currently.

Review of the environmental quality guidelines derived by these jurisdictions in previous numerical EQS development efforts has demonstrated that all are adequately conservative and protective of human and/or environmental health and are thereby considered appropriate and sufficiently defensible values for use as EQS and PSS at impacted sites located within the four Atlantic Provinces. Furthermore, the use of guidelines from these jurisdictions is well established common practice by impacted sites professionals across Atlantic Canada.

One change from the 2014 set of NSE EQS is a somewhat greater reliance on guidelines developed by the BCMOECCS. This reflects a recent comprehensive review and update, undertaken by BCMOECCS, of the BC Contaminated Sites Regulation (CSR) and its associated regulatory instruments and guidance, including environmental quality guidelines. Thus, guidelines from BCMOECCS are among the most current at this time. In addition, review of BCMOECCS technical guidance and protocols indicates that BC environmental quality guidelines are risk-based values that are derived using appropriate and standard methodologies that are the same or similar to those utilized by CCME and other Canadian jurisdictions. As such, the BCMOECCS guideline values are considered equally defensible and appropriate to those developed by the other jurisdictions that were consulted. Similar to the other consulted jurisdictions, BCMOECCS provides various types of technical documentation that describe and explain the guidelines that have been derived and adopted within British Columbia.

The consulted jurisdictions generally utilize the same or similar protocols and methodologies when developing environmental quality guidelines. However, it should be recognized that there are often differences in guideline values between two or more jurisdictions (despite the same or similar protocols being used) that reflect differing science policy between the jurisdictions with respect to certain assumptions and/or default parameter values.

[1] This includes Health Canada Guidelines for Canadian Drinking Water Quality.

The assumptions, models and approaches used in the development of the various adopted EQS and PSS are not discussed in detail within this document. Rather, it is recommended that site professionals and other users of the EQS and PSS consult the relevant source jurisdiction documentation to ensure they understand the underlying scientific principles, approaches and assumptions for the derivation of the adopted EQS and PSS values, as well as the appropriate application of the EQS and PSS.

In some cases, the guidelines that were adopted as EQS and PSS were modified to suit specific Atlantic Canada impacted sites policies and practices, or to make the adopted values more consistent with those developed by CCME or Atlantic PIRI. The types of modifications are briefly described in Section 3.0 and Section 4.0, where relevant. Specific modifications for any given chemical parameter in any of the media considered are described in the referenced tables of Appendix A, where relevant. It is noted that individual Atlantic Provinces may further modify the adopted Atlantic RBCA EQS or PSS, depending on specific requirements within their respective jurisdictions.

Another change in the current EQS and PSS tables (and the Rationale Document herein), relative to those presented in the 2014 NSE EQS and Rationale Document, is with respect to methylmercury (MeHg). This parameter has been removed from the human health soil and groundwater PSS tables, and the ecological soil PSS tables, based on MeHg comprising a very low proportion of total mercury (THg) in soil and groundwater. MeHg typically comprises 1% to 3% of the THg present in soil (USEPA MRC, 1997; USEPA, 2001). Thus, the majority of the THg present in soil at any given time is inorganic Hg. Similar proportions of MeHg are expected for sediments, given that MeHg is highly water soluble and will not partition to sediments to any significant extent (USEPA MRC, 1997; USEPA, 2001). Thus, MeHg has also been removed from the ecological sediment PQS table on this basis. Although MeHg in most surface water bodies is typically <10% of THg (CCME, 2003), MeHg has been retained in the ecological surface water and groundwater PQS sheets as a CCME water quality guideline value exists for this parameter. This CCME guideline is protective of freshwater and marine aquatic life but is not protective of MeHg bioaccumulation and biomagnification in aquatic food webs, nor is it protective of predator consumers of fish and other aquatic life that may contain MeHg in their tissues. Groundwater MeHg proportion of THg would be expected to be similar to or less than what is typical in surface water bodies.

2.7 ANALYTICAL DETECTION LIMIT CONSIDERATIONS

For some of the guidelines that were selected from the preferred source jurisdictions, the guideline values for certain chemicals in certain environmental media are below the typically achievable RDLs for those chemicals in those media. This is not an uncommon situation. Typically, regulatory authorities (including the jurisdictions reviewed for the purpose of selecting PSS and EQS values) will note that a particular guideline value is below the currently achievable RDL, and will sometimes provide direction for site professionals with respect to how site assessment activities should proceed in these situations.
This situation occurs for some CVOC parameters in soil (in relation to vapour intrusion-based human health soil quality guidelines), and for several pesticide parameters in surface water, ground water and sediment. For all such instances where this situation is known to occur, the parameters are bolded and asterisked within the PSS and EQS tables.

For sites where there is a potentially operable soil vapour to indoor air pathway in relation to the affected CVOC parameters, soil vapour or subslab vapour testing is required to determine potential indoor air exposures. In any such testing program, the site professional must consult with and abide by the guidance

provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

For sites with potential sediment, surface water or groundwater contamination in relation to the affected pesticide parameters, additional aquatic media assessment and/or consultation with provincial regulators should occur to confirm if there is a potential that such substances could be present at levels that may adversely affect aquatic biota.

Some general considerations that may be helpful when a PSS or EQS value is less than the achievable RDL are as follows:

- Determine if the parameter of interest is present in other site media, particularly site media where exposure may be expected for human and/or ecological receptors (i.e., site media other than the medium for which the EQS or PSS is <RDL).
- Based on site history and site characterization outcomes, determine if the parameter of interest can be reasonably expected to occur in site media.
- Review the physical-chemical and environmental fate and behaviour properties of the parameter of interest to determine if it is reasonable to anticipate the parameter's presence in site media, especially those site media where exposure may be expected to occur for human and/or ecological receptors.

3.0 Guidelines for Protection of Human Health

3.1 INTRODUCTION

This section of the Rationale Document addresses EQS and PSS that are based on human health effects.

3.2 ADJUSTMENT OF TARGET CANCER RISK LEVEL

The Atlantic Provinces and Atlantic PIRI have long incorporated a target cancer risk level of $1E^{-05}$ (1 in 100,000) as a default scientific policy with respect to what is considered an acceptable level of carcinogenic risk. This policy position is consistent with that of Health Canada for federally owned contaminated sites. Health Canada (2010) notes that a cancer risk in the range of 1 in 100,000 to 1 in 1,000,000 is "essentially negligible" for carcinogenic substances present in drinking water, and in environmental media at federally owned contaminated sites. A target cancer risk level of $1E^{-05}$ has been widely accepted by federal and most provincial agencies within their contaminated or impacted sites programs since the early 1990s. Further information on target cancer risk levels may be found in Health Canada (2010).

In cases where the original adopted guidelines from the source jurisdictions were based on a target cancer risk level of $1E^{-06}$ (1 in 1,000,000), such values were adjusted to reflect a target cancer risk level of $1E^{-05}$.

3.3 HUMAN HEALTH-BASED GUIDELINES FOR SOIL

Human receptors can be exposed to contaminated soil through several exposure pathways including ingestion, dermal contact, vapour migration to indoor air and dust inhalation in outdoor air.

The jurisdictional hierarchy for the selection of human health based EQS and PSS for soil was as follows (in preferential order):

1. Atlantic RBCA Version 4.0 (Atlantic PIRI, 2021) RBSLs and PSSLs (for BTEX, PHCs and selected chlorinated VOCs).
2. CCME Canadian Soil Quality Guidelines for the Protection of Human Health (http://ceqg-rcqe.ccme.ca/en/index.html) for all substances in the master list excluding BTEX and petroleum hydrocarbons; the CCME Canadian Soil Quality Guidelines include the Canadian Soil Quality Guidelines for the Protection of Human Health for Polycyclic Aromatic Hydrocarbons (CCME, 2010).
3. Federal Environmental Quality Guidelines (e.g., https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html.
4. Alberta Environment and Parks Soil and Groundwater Remediation Guidelines (AEP, 2019; https://open.alberta.ca/publications/1926-6243).
5. British Columbia Ministry of Environment and Climate Change Strategies (BCMOECCS) Contaminated Sites Regulation Schedule 3.1, and other applicable guidance and resources related to contaminated sites in BC (http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/guidance-resources; http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/laws-regulations-compliance).
6. Ontario Ministry of the Environment and Climate Change (MOECC) Rationale for Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario (MOECC, 2011).

7. United States Environmental Protection Agency (USEPA) Regional Screening Levels (USEPA, 2019; https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

The Atlantic PIRI Risk Based Corrective Action (RBCA) process has been developed by Atlantic Canadian regulatory agencies for use in assessing petroleum hydrocarbons at impacted sites. This process provides Tier I and Tier II soil (and groundwater) screening levels for total petroleum hydrocarbons (TPH) - expressed as modified TPH (mTPH), as well as for benzene, toluene, ethylbenzene and xylene, for common soil (and groundwater) exposure pathways. The RBCA process includes consideration of many assumptions contained within the CCME Canada-Wide Standard for Petroleum Hydrocarbons in soil and is considered an equivalent approach for the assessment of petroleum hydrocarbons. Atlantic PIRI has recently developed (or adopted) Tier I and Tier II soil and groundwater screening levels for several chlorinated VOCs.

With respect to the USEPA Regional Screening Levels, the original USEPA values for non-carcinogens were divided by a factor of 5. This was done because the USEPA utilizes a target hazard quotient of 1.0 in their derivation process, whereas the standard approach within the CCME and other Canadian jurisdictions is to use a default hazard quotient of 0.2 (or 20%) in the development of human health-based soil quality guidelines.

Where it was necessary to apply MOECC (2011) soil standards, S1 values were applied for the agricultural, residential, and commercial land use categories, while S2 values were applied for the industrial land use category. Details on S1, S2 and other types of soil standards used within Ontario contaminated sites programs are provided within MOECC (2011).

3.3.1 Human Exposures to Sediment

At this time, there are no human health-based guidelines that are specifically derived for the assessment of human sediment exposure.

Recent guidance from Health Canada (2017) indicates that sediment concentrations of CoC's may be screened against available human health-based residential/parkland soil quality guidelines for scenarios where only direct contact exposure (i.e., ingestion, dermal contact) with sediments is expected (such as CCME Canadian Soil Quality Guidelines for human health or other regulatory human health-based soil quality guidelines). However, Health Canada cautions that the exposure factors used to develop soil quality guidelines differ from sediment exposure factors, such that soil quality guidelines could either be over-protective or insufficiently protective of human health, depending on the sediment exposure scenario. In such cases, adjustment of the soil quality guidelines or derivation of site-specific guidelines may be warranted, so long as sufficient technical rationale is provided.

The Atlantic Provinces concur with and support the Health Canada (2017) guidance.

It is noted that human health-based soil quality guidelines do not account for bioaccumulation or biomagnification of chemicals in aquatic food items and cannot be used as screening tools for exposure scenarios that involve aquatic food item consumption.

It is also noted that soil quality guidelines developed for pathways other than direct oral and dermal contact are considered inappropriate for, and not applicable to, sediment exposure scenarios.

3.4 HUMAN HEALTH-BASED GUIDELINES FOR SURFACE WATER

Concerns about surface water quality typically focus on the protection of freshwater or marine aquatic life rather than human health. However, Health Canada provides Recreational Water Quality Guidelines (https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-recreational-water-quality-third-edition.html) that may be used as guidance when assessing surface water quality for such human activities as swimming, water sports and other scenarios involving contact with surface water. In addition, in situations where surface water is used as a drinking water source or where there is believed to be a high potential for incidental ingestion of surface water, the Health Canada Guidelines for Canadian Drinking Water Quality are recommended for use. The Atlantic Canada EQS and PSS do not include human health-based guidelines for surface water quality currently, other than the Guidelines for Canadian Drinking Water Quality.

3.5 HUMAN HEALTH-BASED GUIDELINES FOR GROUNDWATER

Human receptors may be exposed to contaminants in groundwater through direct ingestion (as drinking water) and/or through vapour migration from groundwater to indoor air, and subsequent indoor air inhalation. The jurisdictional hierarchy for the selection of human health based EQS and PSS for groundwater was as follows (in preferential order):

1. Atlantic PIRI Version 4.0 (Atlantic PIRI, 2021) RBSLs and PSSLs (for BTEX, PHCs and selected chlorinated VOCs).
2. Health Canada Guidelines for Canadian Drinking Water Quality (https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality.html#tech_doc).
3. Federal Environmental Quality Guidelines (e.g., https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html).
4. Alberta Environment and Parks Soil and Groundwater Remediation Guidelines (AEP, 2019; https://open.alberta.ca/publications/1926-6243).
5. British Columbia Ministry of Environment and Climate Change Strategies (BCMOECCS) Contaminated Sites Regulation Schedule 3.2, and other applicable guidance and resources related to contaminated sites in BC (http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/guidance-resources; http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/laws-regulations-compliance).
6. Ontario Ministry of the Environment and Climate Change (MOECC) Rationale for Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario (MOECC, 2011).
7. United States Environmental Protection Agency (USEPA) Regional Screening Levels for Tap Water (USEPA, 2019; https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables; and, other USEPA Drinking Water Quality Guidelines provided at: https://www.epa.gov/ground-water-and-drinking-water.

3.5.1 Potable Groundwater Guidelines

Groundwater is an important public resource in Atlantic Canada, where numerous communities rely on groundwater-based drinking water supplies. Groundwater is also used in a wide variety of industrial and commercial activities.

All Atlantic Provinces require that potential impacts to site groundwater be assessed as part of an impacted site characterization process. The classification of local groundwater use (potable versus non-potable) must be confirmed to appropriately apply the relevant Tier I EQS or Tier II PSS values. The individual Atlantic Provinces provide various tools and guidance that can assist a site professional in determining if groundwater at a given site should be considered potable or non-potable. These relevant tools and guidance should be consulted prior to the selection and application of EQS or PSS. Such tools include protocols and guidance that determine the availability of municipal water supplies to a given site, and the location of protected well-fields or source water protection areas relative to a site.

4.0 Guidelines for Protection of Ecological Health

This section of the Rationale Document addresses EQS and PSS that are based on ecological effects.

4.1 ECOLOGICAL HEALTH-BASED GUIDELINES FOR SOIL

The jurisdictional hierarchy for the selection of ecological health based EQS and PSS for soil was as follows (in preferential order):

1. Atlantic PIRI Version 4.0 (Atlantic PIRI, 2021) ESLs (for BTEX, PHCs and selected chlorinated VOCs).
2. CCME Canadian Soil Quality Guidelines for the Protection of Environmental Health (http://ceqg-rcqe.ccme.ca/en/index.html, including: CCME (2008) Canada Wide Standards for Petroleum Hydrocarbons, and, CCME (2010) Canadian Soil Quality Guidelines for the Protection of Environmental Health for Polycyclic Aromatic Hydrocarbons.
3. Federal Environmental Quality Guidelines (https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html).
4. Alberta Environment and Parks Soil and Groundwater Remediation Guidelines (AEP, 2019; https://open.alberta.ca/publications/1926-6243).
5. British Columbia Ministry of Environment and Climate Change Strategies (BCMOECCS) Contaminated Sites Regulation Schedule 3.1, and other applicable guidance and resources related to contaminated sites in BC (http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/guidance-resources; http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/laws-regulations-compliance).
6. Ontario Ministry of the Environment and Climate Change (MOECC) Rationale for Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario (MOECC, 2011).
7. Other jurisdictions, as necessary.

The noted jurisdictions provide ecological soil quality guidelines for all land uses considered herein, and for both coarse-grained and fine-grained soils, where appropriate.

4.2 ECOLOGICAL HEALTH-BASED GUIDELINES FOR SEDIMENT

The jurisdictional hierarchy for the selection of ecological health based EQS for sediments (freshwater and marine) was as follows (in preferential order). No sediment PSS were selected as all currently adopted sediment quality guidelines are protective of benthic organisms in direct contact with sediments. The adopted sediment quality guidelines do not address other ecological pathways or receptors currently.

1. Atlantic PIRI (2021; 2012) Sediment ESLs (for BTEX and petroleum hydrocarbons).
2. CCME Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca/en/index.html).
3. Federal Environmental Quality Guidelines (https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html).
4. British Columbia Ministry of Environment and Climate Change Strategies (BCMOECCS) Contaminated Sites Regulation Schedule 3.4 (http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/laws-regulations-compliance); and/or, BCMOECCS Working Sediment Quality Guidelines (https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/bc_env_working_water_quality_guidelines.pdf).
5. OMOE. 2008. Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario: An Integrated Approach.
6. United States jurisdictions including various sediment quality guidelines developed within USEPA programs and select individual U.S. states.

Where sediment quality guidelines beyond CCME were considered, preference was given to identifying jurisdictions that use similar approaches to CCME in sediment guideline derivation. For example, most existing regulatory sediment quality guidelines (including those derived by CCME and MOECC) are based on co-occurrence data (i.e., correlations or co-incidence of benthic impacts with measured sediment chemical concentrations). While there are a number of different approaches to deriving co-occurrence-based guidelines, most have a number of similarities such that it is considered appropriate to adopt these types of guidelines without modification, even though different substances have guidelines that were derived using slightly different approaches. There are however, some substances (mostly organics, including petroleum hydrocarbons and chlorinated VOCs) for which existing sediment quality guidelines are not based on co-occurrence approaches. Rather, the most common sediment guideline derivation approach for such substances is equilibrium partitioning (EqP). In brief, the EqP approach assumes that pore water exposure is the major exposure pathway and that benthic organisms have a sensitivity that is like pelagic organisms. The EqP approach involves extrapolating a water quality guideline to a bulk sediment concentration using a chemical-specific Koc (organic carbon partitioning coefficient) and a default or site-specific sediment organic carbon content. Further details on the EqP approach may be found in USEPA (2008) and numerous papers within the scientific literature. The Atlantic RBCA (2021; 2012) BTEX and petroleum hydrocarbon sediment ESLs were developed using an EqP approach.

For co-occurrence-based sediment quality guidelines, only probable effect level (PEL) or similar types of guidelines were considered. It has become well established in the past twenty or more years that low-effect level and/or no-effect level sediment quality guidelines are highly conservative, and their exceedance often does not correlate well with other endpoints that are commonly evaluated in aquatic risk assessments (such as sediment toxicity test results and benthic community assessment metrics). In practice, exceedance of the PEL

(and similar values) is the more realistic indicator of a potential for population-level adverse effects within benthic invertebrate communities. Emphasis on PELs or similar guideline values has become a common practice in many sediment assessment programs conducted across Canada.

The sediment EQS for modified TPH and BTEX are adopted directly from Atlantic RBCA (2021; 2012). Users of the sediment EQS are encouraged to review the original Atlantic PIRI guidance documentation to be sure they understand how to derive site or sample specific sediment EQS based on measured sediment organic carbon content (if/where appropriate), as well as the difference between the "typical" and "other" sediment categories.

4.3 ECOLOGICAL HEALTH-BASED GUIDELINES FOR SURFACE WATER

The jurisdictional hierarchy for the selection of ecological health based EQS for surface water (for the protection of freshwater and marine aquatic life) was as follows (in preferential order). No surface water PSS were selected as all currently adopted ecological surface water quality guidelines are protective of freshwater and marine aquatic life in direct contact with surface water. The adopted surface water quality guidelines do not address other ecological pathways or receptors currently.

1. Atlantic RBCA (2021; 2012) Surface Water ESLs (for BTEX and petroleum hydrocarbons).
2. CCME Canadian Water Quality Guidelines (freshwater and marine) for the Protection of Aquatic Life (http://ceqg-rcqe.ccme.ca/en/index.html).
3. Federal Environmental Quality Guidelines (https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html).
4. BCMOECCS Approved and Working Water Quality Guidelines as well as Contaminated Sites Regulation Schedule 3.2 (http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines; http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/laws-regulations-compliance).
5. Alberta Environment and Parks (2018) Environmental Quality Guidelines for Alberta Surface Waters (https://open.alberta.ca/publications/9781460138731).
6. OMOE (1999) Provincial Water Quality Objectives.
7. Ministère de l'Environnement du Québec (2019). On-line updates to Critères de qualité de l'eau de surface au Québec (http://www.mddelcc.gouv.qc.ca/eau/criteres_eau/index.asp).
8. United States jurisdictions, including various water quality guidelines developed within USEPA programs and by select individual U.S. states.

Where surface water quality guidelines beyond CCME and Atlantic RBCA were considered, general preference was given to identifying jurisdictions that use similar approaches to CCME in the derivation of surface water quality guidelines.

If it became necessary to consider surface water quality guidelines from U.S. jurisdictions for a particular CoC, there was no established hierarchy for sourcing guideline values from U.S. federal or state regulatory authorities. Rather, efforts focused on selected U.S. federal and state authorities that are known to have developed surface water quality guidelines for numerous chemicals and that regularly revisit and update their guidelines. Where possible, preference was given to U.S. jurisdictions that use similar surface water quality guideline derivation approaches as the major Canadian jurisdictions that surface water EQS were adopted from (i.e., Atlantic RBCA, CCME, BCMOECCS, MOECC).

As mentioned, the ecological health based EQS for surface water are only applicable for freshwater and marine aquatic life protection. While there are other potential ecological surface water exposure pathways, including plant/crop contact from the use of irrigation water, and livestock and/or wildlife ingestion of surface water, guidelines for these pathways have not been adopted as EQS or PSS at this time. Should these potential surface water pathways merit evaluation at an impacted site, it is recommended that existing guidelines from CCME, BCMOECCS, AEP and other jurisdictions (as appropriate) for these pathways be considered.

4.4 ECOLOGICAL HEALTH-BASED GUIDELINES FOR GROUNDWATER

At this time, ecological EQS for groundwater are values that are protective of freshwater or marine aquatic life, under the assumption that there is groundwater discharge from an impacted site to a receiving water body.

Currently, groundwater EQS are determined by applying a 10X attenuation factor to the surface water EQS values (except for petroleum hydrocarbons and BTEX, as described in Atlantic PIRI, 2021; 2012). The use of a 10X factor has regulatory precedent in several U.S. and Canadian jurisdictions, including NSE, MOECC, BCMOECCS and Massachusett's DEP). These jurisdictions consider a default 10X attenuation factor to be a general conservative order of magnitude factor for the dilution and attenuation of contaminant concentrations that occur during groundwater flow and eventual discharge to a receiving water body.

The groundwater EQS are applicable at site monitor well locations greater than or equal to 10 meters from a freshwater or marine receiving water body. For wells located within 10 meters of a water body (freshwater or marine), groundwater EQS should not be used. Rather, surface water EQS should be applied directly.

For petroleum hydrocarbons and BTEX, Atlantic RBCA (2021; 2012) provides distance-gradated (10 meters to 200 meters from a receiving water body) groundwater ESLs that were developed using the Domenico (1987) analytical solute transport model. These values are not adopted as EQS but may be applied at a Tier II level if deemed appropriate by the site professional.

The same considerations previously noted in **Section 4.3** with respect to the potential ecological surface water exposure pathways of plant/crop contact with irrigation water, and livestock and/or wildlife ingestion of surface water, apply to groundwater EQS as well.

5.0 Consideration of Background Environmental Conditions

It is a common finding that various metals and metalloids (including: aluminum, arsenic, cobalt, iron, manganese, nickel, tin, vanadium) present in Atlantic Canada soils, sediments, surface water and groundwater, exhibit naturally elevated concentrations that may exceed Tier I EQSs and/or Tier II PSSs. For substances with naturally occurring ("background") concentrations that exceed Tier I EQSs or Tier II PSSs, achieving delineation or determining the need for further assessment at impacted sites can become a challenge. At many sites, environmental media concentrations of such metals and metalloids are not the result of current or historical site activities, but rather, reflect natural geological enrichment and/or regional scale impacts such as forest/grass fires, atmospheric deposition of industrial air emissions, urbanization.

While it is relatively common in detailed ESAs and in risk assessment studies to include the consideration of background concentrations of metals and metalloids when identifying substances in site media that may pose a concern to human or ecological health, or otherwise require further investigation, the collection of local background environmental media chemistry data is not typically conducted at initial stages of ESAs. Currently, in Atlantic Canada, there are few curated sources of background environmental data that could potentially represent background conditions for impacted sites located within all Atlantic Provinces. Also, the existing datasets are limited nearly entirely to soils. At some impacted sites, these existing datasets may not necessarily be adequate representations of local background environmental media chemistry. Thus, ESAs conducted at some impacted sites may require the collection of local or regional background environmental media chemistry data in order to achieve delineation of site contaminants and/or to inform the identification of those substances that require further evaluation, and those that do not. It is anticipated that this decision would be made by site professionals on a case-by-case, and site-specific basis.

To facilitate the evaluation of background conditions in the assessment of impacted sites, individual Atlantic Provinces, at their discretion, may develop guidance resources that include protocols, recommended datasets or databases, policies, and potentially other regulatory instruments, that relate to the collection and use of background environmental media chemistry data within Atlantic Canada impacted site assessment programs.

6.0 Atlantic RBCA Environmental Quality Standards (EQS) and Pathway-Specific Standards (PSS)

The Atlantic RBCA Environmental Quality Standards (EQS) and Pathway-Specific Standards (PSS) have been developed to enable consistent assessment and management of potential risks posed to human and ecological receptors at Atlantic region impacted sites, under four common land use categories (i.e., agricultural, residential/parkland, commercial, and industrial), and under conditions of potable and non-potable groundwater use, and coarse and fine-grained soil texture.

EQS are considered to be Tier I values that are the lowest of all applicable or potentially applicable PSS for each receptor type (human health and ecological), land use, groundwater classification and soil texture type, and are inherently more conservative than PSS. The PSS are specific to certain exposure pathways (and/or receptor types) and are considered to be Tier II values for which their application requires more site characterization information than is typically required for the application of Tier I EQS.

The use and application of Atlantic RBCA Tier I EQS and Tier II PSS will be determined by the individual Atlantic Provinces using regulations, policy, or other regulatory instruments.

In general, the application of Atlantic RBCA Tier I EQS assumes that all relevant exposure pathways and receptors that may be associated with a particular land use type, are operable and/or present at a site. Should site media CoC concentrations exceed applicable Tier I EQS, they may then be compared to applicable Tier II PSS. At Tier II, operable and inoperable site exposure pathways and/or non-relevant receptors can be identified such that PSS developed for inoperable pathways and/or inappropriate receptors may be excluded, so long as sufficient rationale or justification is provided. If the justification for pathway or receptor exclusion involves management measures to control certain exposure pathways or to restrict access for certain receptor types, site professionals should expect that additional regulatory requirements may apply.

EQS and PSS should always be applied in conjunction with the site professionals' understanding and consideration of applicable legislation, regulations, and other regulatory instruments (including various protocols, policies and guidance documentation) within each of the four Atlantic Provinces.

Most EQS and PSS can be applied directly as "look-up" values; however, the EQS or PSS for some CoC's in some media are able to be adjusted on the basis of site-specific data on such factors/parameters as pH, water hardness, and sediment organic carbon content. Site professionals are expected to understand and consider the conditions under which EQS and PSS may be modified with site-specific data.

For sites which have unique characteristics (such that the typical assumptions regarding exposure pathways, receptors and land use that are inherent to the adopted EQS and PSS values, may not apply), a site-specific risk assessment approach should be considered. A site-specific risk assessment approach, or another means deemed appropriate by the site professional and provincial regulator, should also be considered if site media are impacted by CoC's that do not have EQS or PSS available.

A list of the regulatory sources or reference documentation for the adopted EQS and PSS values (from the consulted jurisdictions, following the hierarchies presented previously) is provided in **Section 7.0**. The PSS tables presented in **Appendix A** indicate the regulatory sources of each of the selected PSS values.

7.0 Primary Regulatory Sources and Reference Documentation for the Selected EQS and PSS Values

The main sources of regulatory guidelines (and related documentation) that were used to identify EQS and PSS for adoption within Atlantic Canada impacted sites programs were as follows.

Atlantic RBCA Version 4.0 (Atlantic PIRI, 2021) RBSLs, PSSLs and ESLs (for BTEX, PHCs, and selected chlorinated VOCs).

Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (http://ceqg-rcqe.ccme.ca/en/index.html).

Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standard for Petroleum Hydrocarbons in Soil; https://www.ccme.ca/en/resources/contaminated_site_management/phc_cws_in_soil.html.

Federal Environmental Quality Guidelines (https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/federal-environmental-quality-guidelines.html).

Alberta Environment and Parks Soil and Groundwater Remediation Guidelines (AEP, 2019; https://open.alberta.ca/publications/1926-6243).

British Columbia Contaminated Sites Regulation (Schedules 3.1, 3.2 and 3.4), and other applicable guidance and resources related to contaminated sites in BC (http://www2.gov.bc.ca/gov/content/environment/air-land-

water/site-remediation/guidance-resources; http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/laws-regulations-compliance).

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APPENDIX A

Atlantic RBCA Environmental Quality Standards (EQS) and Pathway-Specific Standards (PSS) Tables

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Inorganic Parameters								
Aluminum	15,400	15,400	15,400	15,400	15,400	15,400	220,000	220,000
Antimony	7.5	7.5	7.5	7.5	7.5	7.5	63	63
Arsenic	10	10	10	10	10	10	10	10
Barium	350	350	350	350	350	350	350	350
Beryllium	1	1	1	1	1	1	1	1
Boron (Total)	4300	4300	4300	4300	4300	4300	24,000	24,000
Boron (mg/L in saturated paste extract)	65	118	65	118	65	118	65	118
Cadmium	1	1	1	1	1	1	1	1
Chromium (hexavalent)	60	60	60	60	60	60	60	60
Chromium (total)	220	220	220	220	630	630	2300	2300
Cobalt	22	22	22	22	22	22	25	25
Copper	250	250	250	250	250	250	250	250
Cyanide	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Iron	11,000	11,000	11,000	11,000	11,000	11,000	164,000	164,000
Lead	120	120	120	120	120	120	120	120
Manganese	360	360	360	360	360	360	2000	2000
Mercury (total)	6.6	6.6	6.6	6.6	24	24	99	99
Molybdenum	15	15	15	15	15	15	15	15
Nickel	70	70	70	70	70	70	70	70
Selenium	1	1	1	1	1	1	1	1
Silver	77	77	77	77	77	77	490	490
Strontium	9400	9400	9400	9400	9400	9400	140,000	140,000
Thallium	1	1	1	1	1	1	1	1
Tin	9400	9400	9400	9400	9400	9400	140,000	140,000
Uranium	23	23	23	23	30	30	30	30
Vanadium	39	39	39	39	39	39	100	100
Zinc	200	200	200	200	200	200	200	200
General Chemistry Parameters								
Chloride	100	100	100	100	100	100	100	100
Sodium	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Petroleum Hydrocarbons (PHC) Parameters								
Benzene	0.094	0.021	0.094	0.021	0.094	0.042	0.094	0.042
Toluene	0.74	0.35	0.74	0.35	0.74	0.35	0.74	0.35
Ethylbenzene	0.089	0.043	0.089	0.043	0.089	0.043	0.089	0.043
Xylene	1.5	0.73	1.5	0.73	1.5	0.73	1.5	0.73
Modified TPH (Gas)	1900	75	1900	75	1900	940	1900	940
Modified TPH (Fuel)	4700	320	4700	320	4700	1800	4700	1800
Modified TPH (Lube)	10,000	1800	10,000	1800	10,000	10,000	10,000	10,000
MTBE	0.044	0.046	0.044	0.046	0.044	0.062	0.044	0.062
Polycyclic Aromatic Hydrocarbons (PAH) Parameters								
Non-Carcinogenic PAH Compounds								
Naphthalene	28	2.2	28	2.2	28	25	28	25
1 - Methylnaphthalene	42	30	42	30	42	30	42	30
2 - Methylnaphthalene	42	30	42	30	42	30	42	30
Acenaphthene	5300	3900	5300	3900	8000	8000	75,000	43,000
Acenaphthylene	32	4.5	32	4.5	32	23	32	23
Anthracene	24,000	24,000	24,000	24,000	37,000	37,000	300,000	300,000
Fluoranthene	3500	3500	3500	3500	5300	5300	50,000	50,000
Fluorene	2700	2700	2700	2700	4100	4100	39,000	39,000

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Phenanthrene	24	17	24	17	24	17	24	17
Pyrene	2100	2100	2100	2100	3200	3200	30,000	30,000
Carcinogenic PAH Compounds								
BaP Total Potency Equivalents	5.3 and IACR<1.0	5.3 and IACR<1.0	5.3 and IACR<1.0	5.3 and IACR<1.0	5.3 and IACR<1.0	5.3 and IACR<1.0	5.3 and IACR<1.0	5.3 and IACR<1.0
Benz[a]anthracene	6.4	12	6.4	12	6.4	12	6.4	12
Benzo[a]pyrene	7	14	7	14	7	14	7	14
Benzo[b,j,k]fluoranthene isomers	0.64	1.2	0.64	1.2	0.64	1.2	0.64	1.2
Benzo[g,h,i]perylene	130	250	130	250	130	250	130	250
Chrysene	40	78	40	78	40	78	40	78
Dibenz[a,h]anthracene	4.4	8.8	4.4	8.8	4.4	8.8	4.4	8.8
Indeno[1,2,3-c,d]pyrene	51	98	51	98	51	98	51	98
Volatile Organic Compound (VOC) Parameters								
Bromodichloromethane	1.9	1.5	1.9	1.5	1.9	1.5	1.9	1.5
Bromoform	2.6	2.3	2.6	2.3	2.9	2.3	2.9	2.3
Bromomethane*	0.0034	0.00034	0.0034	0.00034	0.012	0.0016	0.012	0.0016
Carbon Tetrachloride* (Tetrachloromethane)	0.013	0.00057	0.013	0.00057	0.037	0.0069	0.037	0.0069
Chlorobenzene	0.39	0.018	0.39	0.018	0.61	0.22	0.61	0.22
Chloroethane	-	-	-	-	-	-	-	-
Chloroform	0.22	0.011	0.22	0.011	0.53	0.14	0.53	0.14
Chloromethane	-	-	-	-	-	-	-	-
Dibromochloromethane	0.91	0.27	0.91	0.27	0.91	1.5	0.91	1.5
1,2-Dichlorobenzene	0.097	0.18	0.097	0.18	0.097	0.18	0.097	0.18
1,3-Dichlorobenzene	34	24	34	24	34	24	34	24
1,4-Dichlorobenzene	0.051	0.098	0.051	0.098	0.051	0.098	0.051	0.098
1,1-Dichloroethane	0.6	0.47	0.6	0.47	0.6	0.47	0.6	0.47
1,2-Dichloroethane*	0.025	0.0027	0.025	0.0027	0.025	0.033	0.025	0.033
1,1-Dichloroethylene	0.38	0.039	0.38	0.039	0.38	0.17	0.38	0.17
cis-1,2-Dichloroethylene*	0.52	0.019	0.52	0.019	1.0	0.24	1.0	0.24
trans-1,2-Dichloroethylene*	0.56	0.02	0.56	0.02	1.4	0.25	1.4	0.25
1,2-Dichloropropane	0.085	0.01	0.085	0.01	0.68	0.16	0.68	0.16
1,3-Dichloropropene	0.81	0.27	0.81	0.27	0.81	0.59	0.81	0.59
Ethylene Dibromide*	0.0054	0.0048	0.0054	0.0048	0.0062	0.0048	0.0062	0.0048
Methylene Chloride (Dichloromethane)	0.21	0.32	0.21	0.32	0.21	0.32	0.21	0.32
Styrene	19	16	19	16	66	42	66	42
1,1,1,2-Tetrachloroethane	0.2	0.15	0.2	0.15	0.2	0.15	0.2	0.15
1,1,2,2-Tetrachloroethane	0.096	0.045	0.096	0.045	0.19	0.14	0.19	0.14
Tetrachloroethylene*	0.39	0.016	0.39	0.016	0.57	0.2	0.57	0.2
1,1,1-Trichloroethane	3.4	0.38	3.4	0.38	27	6.1	27	6.1
1,1,2-Trichloroethane	0.18	0.3	0.18	0.3	0.73	0.42	0.73	0.42
Trichloroethylene*	0.02	0.00081	0.02	0.00081	0.13	0.01	0.13	0.01
Vinyl Chloride*	0.0087	0.00031	0.0087	0.00031	0.06	0.0079	0.06	0.016
Pesticides								
Aldicarb	0.041	0.065	0.041	0.065	0.041	0.065	0.041	0.065
Aldrin	3.4	3.4	3.4	3.4	5.1	5.1	5.9	11
Atrazine	0.1	0.17	0.1	0.19	0.1	0.19	0.1	0.19
Azinphos-methyl	0.41	0.75	0.41	0.75	0.41	0.75	0.41	0.75
Bendiocarb	0.14	0.21	0.14	0.21	0.14	0.21	0.14	0.21
Bromoxynil	0.18	0.35	0.18	0.35	0.18	0.35	0.18	0.35
Carbaryl	1.9	3.6	1.9	3.6	1.9	3.6	1.9	3.6

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Carbofuran	0.68	1.2	0.68	1.2	0.68	1.2	0.68	1.2
Chlorothalonil	27	53	27	53	27	53	27	53
Chlorpyrifos	49	95	49	95	49	95	49	95
Cyanazine	0.12	0.21	0.12	0.21	0.12	0.21	0.12	0.21
2,4-D	0.43	0.69	0.43	0.67	0.43	0.67	0.43	0.67
DDT	220	220	220	220	340	340	1600	1600
Diazinon	2.2	4.2	2.2	4.2	2.2	4.2	2.2	4.2
Dicamba	0.5	0.79	0.5	0.79	0.5	0.79	0.5	0.79
Dichlorfop-methyl	22	22	22	22	34	34	160	160
Dieldrin	0.59	3.4	0.59	1.1	0.59	1.1	0.59	1.1
Dimethoate	0.077	0.12	0.077	0.12	0.077	0.12	0.077	0.12
Dinoseb	2.8	5.5	2.8	5.5	2.8	5.5	2.8	5.5
Diquat	11	21	11	21	11	21	11	21
Diuron	1.9	3.5	1.9	3.5	1.9	3.5	1.9	3.5
Endosulfan	99	190	99	190	99	190	99	190
Endrin	2.4	4.7	2.4	4.7	2.4	4.7	2.4	4.7
Glyphosate	0.95	1.4	0.95	1.4	0.95	1.4	0.95	1.4
Heptachlor	0.039	0.012	0.039	0.012	0.039	0.076	0.039	0.076
Lindane	0.31	0.6	0.31	0.6	0.31	0.6	0.31	0.6
Linuron	0.56	1.1	0.56	1.1	0.56	1.1	0.56	1.1
Malathion	0.82	1.3	0.82	1.3	0.82	1.3	0.82	1.3
MCPA	0.42	0.66	0.42	0.66	0.42	0.66	0.42	0.66
Methoxychlor	3500	3500	3500	3500	5300	5300	50,000	50,000
Metolachlor	1.3	2.4	1.3	2.4	1.3	2.4	1.3	2.4
Metribuzin	7.8	15	7.8	15	7.8	15	7.8	15
Paraquat	1.1	2.2	1.1	2.2	1.1	2.2	1.1	2.2
Parathion	7.2	14	7.2	14	7.2	14	7.2	14
Phorate	0.075	0.14	0.075	0.14	0.075	0.14	0.075	0.14
Picloram	0.64	0.94	0.64	0.94	0.64	0.94	0.64	0.94
Simazine	0.14	0.25	0.14	0.25	0.14	0.25	0.14	0.25
Tebuthiuron	2.5	3.7	2.5	3.7	2.5	3.7	2.5	3.7
Terbufos	0.08	0.015	0.08	0.15	0.08	0.15	0.08	0.15
Toxaphene	3.3	4.8	3.3	4.8	3.3	6.3	3.3	6.3
Triallate	16	31	16	31	16	31	16	31
Trifluralin	110	110	110	110	160	160	770	770
PFAS Substances								
Perfluorooactanoic acid (PFOA) [3]	0.7	0.7	0.7	0.7	1.05	1.05	9.94	9.94
Perfluorooctane sulfonate (PFOS) [3]	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Perfluorobutanoate (PFBA)	114	114	114	114	173	173	1630	1630
Perfluorobutane sulfonate (PFBS)	61	61	61	61	92	92	872	872
Perfluorohexanesulfonate (PFHxS)	2.3	2.3	2.3	2.3	3.5	3.5	33	33
Perfluoropentanoate (PFPeA)	0.8	0.8	0.8	0.8	1.21	1.21	11.41	11.41
Perfluorohexanoate (PFHxA)	0.8	0.8	0.8	0.8	1.21	1.21	11.41	11.41
Perfluoroheptanoate (PFHpA)	0.8	0.8	0.8	0.8	1.21	1.21	11.41	11.41
Perfluorononanoate (PFNA)	0.08	0.08	0.08	0.08	0.13	0.13	1.2	1.2
Other Parameters								
Polychlorinated Biphenyl (Total PCB)	22	22	22	22	33	33	160	160
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000004	0.000004	0.000004	0.000004	0.000004	0.000004	0.000004	0.000004
Pentachlorophenol (PCP)	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Organotins - Tributyltin	3.8	3.8	3.8	3.8	3.8	3.8	50	50

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse
Ethylene Glycol	60	68	60	68	60	68	60	68
Propylene Glycol	-	-	-	-	-	-	-	-
Phenol	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8

Notes:

[1] All values are in units of mg/kg unless otherwise noted.

[2] "-" indicates no guideline available; In the Tier I EQS soil tables, the Upper Concentration Limit (UCL) of 10,000 mg/kg in soil has been applied to any petroleum hydrocrbon calculated concentration that is >RES (residual concentration) or exceeds 10,000 mg/kg, following Atlantic RBCA guidance; IACR means the CCME Index of Additive Cancer Risk for carcinogenic PAHs.

[3] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Non-Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Inorganic Parameters								
Aluminum	15,400	15,400	15,400	15,400	15,400	15,400	220,000	220,000
Antimony	7.5	7.5	7.5	7.5	7.5	7.5	63	63
Arsenic	31	31	31	31	31	31	31	31
Barium	6800	6800	6800	6800	10,000	10,000	96,000	96,000
Beryllium	75	75	75	75	110	110	1100	1100
Boron (Total)	4300	4300	4300	4300	4300	4300	24,000	24,000
Boron (mg/L in saturated paste extract)	7500	7500	7500	7500	11,000	11,000	110,000	110,000
Cadmium	1.4	1.4	14	14	49	49	192	192
Chromium (hexavalent)	160	160	160	160	160	160	1300	1300
Chromium (total)	220	220	220	220	630	630	2300	2300
Cobalt	22	22	22	22	22	22	250	250
Copper	1100	1100	1100	1100	4000	4000	16,000	16,000
Cyanide	29	29	29	29	110	110	420	420
Iron	11,000	11,000	11,000	11,000	11,000	11,000	164,000	164,000
Lead	140	140	140	140	260	260	740	740
Manganese	360	360	360	360	360	360	5200	5200
Mercury (total)	6.6	6.6	6.6	6.6	24	24	99	99
Molybdenum	110	110	110	110	110	110	1200	1200
Nickel	200	200	200	200	310	310	2500	2500
Selenium	80	80	80	80	125	125	1135	1135
Silver	77	77	77	77	77	77	490	490
Strontium	9400	9400	9400	9400	9400	9400	140,000	140,000
Thallium	1	1	1	1	1	1	1	1
Tin	9400	9400	9400	9400	9400	9400	140,000	140,000
Uranium	23	23	23	23	33	33	300	300
Vanadium	39	39	39	39	39	39	160	160
Zinc	10,000	10,000	10,000	10,000	16,000	16,000	140,000	140,000
General Chemistry Parameters								
Chloride	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000
Sodium	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000
Petroleum Hydrocarbons (PHC) Parameters								
Benzene	0.49	0.021	0.49	0.021	6.9	0.52	6.9	0.52
Toluene	900	47	900	47	1400	1400	4700	4700
Ethylbenzene	2000	60	2000	60	3100	3100	10,000	10,000
Xylene	120	4.9	120	4.9	1800	60	6300	60
Modified TPH (Gas)	10,000	75	10,000	75	10,000	2000	10,000	2000
Modified TPH (Fuel)	8600	320	8600	320	10,000	10,000	10,000	10,000
Modified TPH (Lube)	10,000	1800	10,000	1800	10,000	10,000	10,000	10,000
MTBE	1.1	0.046	1.1	0.046	7.4	0.57	7.4	0.57
Polycyclic Aromatic Hydrocarbons (PAH) Parameters								
Non-Carcinogenic PAH Compounds								
Naphthalene	51	2.2	51	2.2	370	25	370	25
1 - Methylnaphthalene	72	72	72	72	72	72	560	560
2 - Methylnaphthalene	72	72	72	72	72	72	560	560
Acenaphthene	5300	3900	5300	3900	8000	8000	75,000	43,000
Acenaphthylene	33	4.5	33	4.5	78	66	96	66

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Non-Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Anthracene	24,000	24,000	24,000	24,000	37,000	37,000	300,000	300,000
Fluoranthene	3500	3500	3500	3500	5300	5300	50,000	50,000
Fluorene	2700	2700	2700	2700	4100	4100	39,000	39,000
Phenanthrene	-	-	-	-	-	-	-	-
Pyrene	2100	2100	2100	2100	3200	3200	30,000	30,000
Carcinogenic PAH Compounds								
BaP Total Potency Equivalents	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Benz[a]anthracene	-	-	-	-	-	-	-	-
Benzo[a]pyrene	-	-	-	-	-	-	-	-
Benzo[b,j,k]fluoranthene isomers	-	-	-	-	-	-	-	-
Benzo[g,h,i]perylene	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-
Dibenz[a,h]anthracene	-	-	-	-	-	-	-	-
Indeno[1,2,3-c,d]pyrene	-	-	-	-	-	-	-	-
Volatile Organic Compound (VOC) Parameters								
Bromodichloromethane	130	130	130	130	130	130	180	180
Bromoform	2.6	2.7	2.6	2.7	17	6.1	17	6.1
Bromomethane*	0.0034	0.00034	0.0034	0.00034	0.012	0.0016	0.012	0.0016
Carbon Tetrachloride* (Tetrachloromethane)	0.013	0.00057	0.013	0.00057	0.092	0.0069	0.092	0.0069
Chlorobenzene	0.39	0.018	0.39	0.018	2.7	0.22	2.7	0.22
Chloroethane	-	-	-	-	-	-	-	-
Chloroform	0.22	0.011	0.22	0.011	1.5	0.14	1.5	0.14
Chloromethane	-	-	-	-	-	-	-	-
Dibromochloromethane	7.8	0.27	7.8	0.27	76	2.5	76	2.5
1,2-Dichlorobenzene	230	10	230	10	1700	130	1700	130
1,3-Dichlorobenzene	420	420	420	420	420	420	4400	4400
1,4-Dichlorobenzene	14	0.67	14	0.67	100	8	100	8
1,1-Dichloroethane	31	3.5	31	3.5	39	56	39	56
1,2-Dichloroethane*	0.055	0.0027	0.055	0.0027	0.37	0.033	0.37	0.033
1,1-Dichloroethylene	0.93	0.039	0.93	0.039	6.6	0.49	6.6	0.49
cis-1,2-Dichloroethylene*	0.52	0.019	0.52	0.019	3.8	0.24	3.8	0.24
trans-1,2-Dichloroethylene	0.56	0.02	0.56	0.02	4.1	0.25	4.1	0.25
1,2-Dichloropropane	0.085	0.01	0.085	0.01	0.68	0.16	0.68	0.16
1,3-Dichloropropene	0.83	0.27	0.83	0.27	2.1	1.8	2.1	1.8
Ethylene Dibromide*	0.0054	0.014	0.0054	0.014	0.019	0.015	0.019	0.015
Methylene Chloride (Dichloromethane)	16	0.71	16	0.71	110	9.0	110	9
Styrene	19	16	19	16	170	42	170	42
1,1,1,2-Tetrachloroethane	0.46	0.58	0.46	0.58	1.1	0.87	1.1	0.87
1,1,2,2-Tetrachloroethane	0.096	0.045	0.096	0.045	0.94	0.19	0.94	0.19
Tetrachloroethylene*	0.39	0.016	0.39	0.016	2.9	0.2	2.9	0.2
1,1,1-Trichloroethane	3.4	0.38	3.4	0.38	42	6.1	42	6.1
1,1,2-Trichloroethane	0.18	0.3	0.18	0.3	1.1	0.42	1.1	0.42
Trichloroethylene*	0.02	0.00081	0.02	0.00081	0.14	0.01	0.14	0.01
Vinyl Chloride*	0.0087	0.00031	0.0087	0.00031	0.12	0.0079	0.24	0.016

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Non-Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Pesticides								
Aldicarb	22	22	22	22	34	34	160	160
Aldrin	3.4	3.4	3.4	3.4	5.1	5.1	44	44
Atrazine	11	11	11	11	17	17	80	80
Azinphos-methyl	55	55	55	55	84	84	400	400
Bendiocarb	89	89	89	89	130	130	640	640
Bromoxynil	11	11	11	11	17	17	80	80
Carbaryl	220	220	220	220	340	340	1600	1600
Carbofuran	220	220	220	220	340	340	1600	1600
Chlorothalonil	330	330	330	330	500	500	2400	2400
Chlorpyrifos	220	220	220	220	340	340	1600	1600
Cyanazine	29	29	29	29	44	44	210	210
2,4-D	220	220	220	220	340	340	1600	1600
DDT	220	220	220	220	340	340	1600	1600
Diazinon	44	44	44	44	67	67	320	320
Dicamba	280	280	280	280	420	420	2000	2000
Dichlorfop-methyl	22	22	22	22	34	34	160	160
Dieldrin	3.4	3.4	3.4	3.4	5.1	5.1	44	44
Dimethoate	44	44	44	44	67	67	320	320
Dinoseb	22	22	22	22	34	34	160	160
Diquat	180	180	180	180	270	270	1300	1300
Diuron	350	350	350	350	520	520	2500	2500
Endosulfan	210	210	210	210	320	320	3000	3000
Endrin	10	10	10	10	15	15	130	130
Glyphosate	670	670	670	670	1000	1000	4800	4800
Heptachlor	0.21	0.012	0.21	0.012	0.69	0.094	2.4	0.094
Lindane	6.7	6.7	6.7	6.7	10	10	48	48
Linuron	44	44	44	44	67	67	320	320
Malathion	440	440	440	440	670	670	3200	3200
MCPA	460	460	460	460	690	690	8200	8200
Methoxychlor	3500	3500	3500	3500	5300	5300	50,000	50,000
Metolachlor	110	110	110	110	170	170	800	800
Metribuzin	180	180	180	180	280	280	1300	1300
Paraquat	22	22	22	22	34	34	160	160
Parathion	110	110	110	110	170	170	800	800
Phorate	4.4	4.4	4.4	4.4	6.7	6.7	32	32
Picloram	440	440	440	440	670	670	3200	3200
Simazine	29	29	29	29	44	44	210	210
Tebuthiuron	1600	1600	1600	1600	2400	2400	11,000	11,000
Terbufos	1.1	1.1	1.1	1.1	1.7	1.7	8	8
Toxaphene	4.8	4.8	4.8	4.8	7.3	7.3	7.3	7.3
Triallate	290	290	290	290	440	440	2100	2100
Trifluralin	110	110	110	110	160	160	770	770

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Soil - All Land Uses; Non-Potable Groundwater Condition (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
PFAS Substances								
Perfluorooactanoic acid (PFOA) [3]	0.7	0.7	0.7	0.7	1.05	1.05	9.94	9.94
Perfluorooctane sulfonate (PFOS) [3]	2.1	2.1	2.1	2.1	3.2	3.2	30.5	30.5
Perfluorobutanoate (PFBA)	114	114	114	114	173	173	1630	1630
Perfluorobutane sulfonate (PFBS)	61	61	61	61	92	92	872	872
Perfluorohexanesulfonate (PFHxS)	2.3	2.3	2.3	2.3	3.5	3.5	33	33
Perfluoropentanoate (PFPeA)	0.8	0.8	0.8	0.8	1.21	1.21	11.41	11.41
Perfluorohexanoate (PFHxA)	0.8	0.8	0.8	0.8	1.21	1.21	11.41	11.41
Perfluoroheptanoate (PFHpA)	0.8	0.8	0.8	0.8	1.21	1.21	11.41	11.41
Perfluorononanoate (PFNA)	0.08	0.08	0.08	0.08	0.13	0.13	1.2	1.2
Other Parameters								
Polychlorinated Biphenyl (Total PCB)	22	22	22	22	33	33	160	160
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000004	0.000004	0.000004	0.000004	0.000004	0.000004	0.000004	0.000004
Pentachlorophenol (PCP)	93	93	93	93	340	340	1300	1300
Organotins - Tributyltin	3.8	3.8	3.8	3.8	3.8	3.8	50	50
Ethylene Glycol	73,000	73,000	73,000	73,000	110,000	110,000	530,000	530,000
Propylene Glycol	-	-	-	-	-	-	-	-
Phenol	500	500	500	500	1800	1800	2100	2100

Notes:

[1] All values are in units of mg/kg unless otherwise noted.

[2] "-" indicates no guideline available.In the Tier I EQS soil tables, the Upper Concentration Limit (UCL) of 10,000 mg/kg in soil has been applied to any petroleum hydrocrbon calculated concentration that is >RES (residual concentration) or exceeds 10,000 mg/kg, following Atlantic RBCA guidance

[3] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Inorganic Parameters								
Aluminum	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*
Antimony	6	6	6	6	6	6	6	6
Arsenic	10	10	10	10	10	10	10	10
Barium	1000	1000	1000	1000	1000	1000	1000	1000
Beryllium	4	4	4	4	4	4	4	4
Boron	5000	5000	5000	5000	5000	5000	5000	5000
Cadmium	5	5	5	5	5	5	5	5
Chromium (hexavalent)	50	50	50	50	50	50	50	50
Chromium (total)	50	50	50	50	50	50	50	50
Cobalt	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Copper	2000	2000	2000	2000	2000	2000	2000	2000
Cyanide	200	200	200	200	200	200	200	200
Iron	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*
Lead	5	5	5	5	5	5	5	5
Manganese	120	120	120	120	120	120	120	120
Mercury (total)	1	1	1	1	1	1	1	1
Molybdenum	70	70	70	70	70	70	70	70
Nickel	100	100	100	100	100	100	100	100
Selenium	50	50	50	50	50	50	50	50
Silver	-	-	-	-	-	-	-	-
Strontium	2400	2400	NGR	NGR	2400	2400	2400	2400
Thallium	2	2	2	2	2	2	2	2
Tin	2400	2400	2400	2400	2400	2400	2400	2400
Uranium	20	20	20	20	20	20	20	20
Vanadium	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Zinc	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*
General Chemistry Parameters								
Chloride	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*
Sodium	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*
Petroleum Hydrocarbons (PHC) Parameters								
Benzene	5	5	5	5	5	5	5	5
Toluene	24	24	24	24	24	24	24	24
Ethylbenzene	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Xylene	20	20	20	20	20	20	20	20
Modified TPH (Gas)	4400	4400	4400	4400	4400	4400	4400	4400
Modified TPH (Fuel)	3200	3200	3200	3200	3200	3200	3200	3200
Modified TPH (Lube)	7800	7800	7800	7800	7800	7800	7800	7800
MTBE	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*	*NG*
Polycyclic Aromatic Hydrocarbons (PAH) Parameters								
Non-Carcinogenic PAH Compounds								
Naphthalene	470	470	470	470	470	470	470	470
1 - Methylnaphthalene	12	12	12	12	12	12	12	12

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
2 - Methylnaphthalene	12	12	12	12	12	12	12	12
Acenaphthene	1400	1400	1400	1400	1400	1400	1400	1400
Acenaphthylene	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Anthracene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Fluoranthene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Fluorene	940	940	940	940	940	940	940	940
Phenanthrene	-	-	-	-	-	-	-	-
Pyrene	710	710	710	710	710	710	710	710
Carcinogenic PAH Compounds								
BaP Total Potency Equivalents (BaP TPE)	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Benz[a]anthracene	-	-	-	-	-	-	-	-
Benzo[a]pyrene	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Benzo[b,j,k]fluoranthene isomers	-	-	-	-	-	-	-	-
Benzo[g,h,i]perylene	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-
Dibenz[a,h]anthracene	-	-	-	-	-	-	-	-
Indeno[1,2,3-c,d]pyrene	-	-	-	-	-	-	-	-
Volatile Organic Compound (VOC) Parameters								
Bromodichloromethane	100	100	100	100	100	100	100	100
Bromoform	100	100	100	100	100	100	100	100
Bromomethane	51	5.6	51	5.6	51	33	51	33
Carbon Tetrachloride (Tetrachloromethane)	2	0.57	2	0.57	2	2	2	2
Chlorobenzene	80	14	80	14	80	80	80	80
Chloroethane	-	-	-	-	-	-	-	-
Chloroform	80	30	80	30	80	80	80	80
Chloromethane	38	38	38	38	38	38	38	38
Dibromochloromethane	190	190	190	190	190	190	190	190
1,2-Dichlorobenzene	200	200	200	200	200	200	200	200
1,3-Dichlorobenzene	59	59	59	59	59	59	59	59
1,4-Dichlorobenzene	5	5	5	5	5	5	5	5
1,1-Dichloroethane	3100	320	3100	320	3700	3700	3700	3700
1,2-Dichloroethane	5	5	5	5	5	5	5	5
1,1-Dichloroethylene	14	14	14	14	14	14	14	14
cis-1,2-Dichloroethylene	70	70	70	70	70	70	70	70
trans-1,2-Dichloroethylene	100	100	100	100	100	100	100	100
1,2-Dichloropropane	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
1,3-Dichloropropene	6.7	5.2	6.7	5.2	6.7	6.7	6.7	6.7
Ethylene Dibromide	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Methylene Chloride (Dichloromethane)	50	50	50	50	50	50	50	50
Styrene	100	100	100	100	100	100	100	100
1,1,1,2- Tetrachloroethane	26	26	26	26	26	26	26	26
1,1,2,2-Tetrachloroethane	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Tetrachloroethylene	10	10	10	10	10	10	10	10

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
1,1,1-Trichloroethane	6700	640	6700	640	10,000	10,000	10,000	10,000
1,1,2-Trichloroethane	12	12	12	12	12	12	12	12
Trichloroethylene	5	5	5	5	5	5	5	5
Vinyl Chloride	2	2	2	2	2	2	2	2
Pesticides								
Aldicarb	-	-	-	-	-	-	-	-
Aldrin	-	-	-	-	-	-	-	-
Atrazine	5	5	5	5	5	5	5	5
Azinphos-methyl	20	20	20	20	20	20	20	20
Bendiocarb	40	40	40	40	40	40	40	40
Bromoxynil	5	5	5	5	5	5	5	5
Carbaryl	90	90	90	90	90	90	90	90
Carbofuran	90	90	90	90	90	90	90	90
Chlorothalonil	140	140	140	140	140	140	140	140
Chlorpyrifos	90	90	90	90	90	90	90	90
Cyanazine	10	10	10	10	10	10	10	10
2,4-D	100	100	100	100	100	100	100	100
DDT	93	93	93	93	93	93	93	93
Diazinon	20	20	20	20	20	20	20	20
Dicamba	120	120	120	120	120	120	120	120
Dichlorfop-methyl	-	-	-	-	-	-	-	-
Dieldrin	-	-	-	-	-	-	-	-
Dimethoate	20	20	20	20	20	20	20	20
Dinoseb	-	-	-	-	-	-	-	-
Diquat	70	70	70	70	70	70	70	70
Diuron	150	150	150	150	150	150	150	150
Endosulfan	57	57	57	57	57	57	57	57
Endrin	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Glyphosate	280	280	280	280	280	280	280	280
Heptachlor	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
Lindane	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Linuron	19	19	19	19	19	19	19	19
Malathion	190	190	190	190	190	190	190	190
MCPA	100	100	100	100	100	100	100	100
Methoxychlor	-	-	-	-	-	-	-	-
Metolachlor	50	50	50	50	50	50	50	50
Metribuzin	80	80	80	80	80	80	80	80
Paraquat	10	10	10	10	10	10	10	10
Parathion	-	-	-	-	-	-	-	-
Phorate	2	2	2	2	2	2	2	2
Picloram	190	190	190	190	190	190	190	190
Simazine	10	10	10	10	10	10	10	10
Tebuthiuron	660	660	660	660	660	660	660	660

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Terbufos	1	1	1	1	1	1	1	1
Toxaphene	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Triallate	120	120	120	120	120	120	120	120
Trifluralin	45	45	45	45	45	45	45	45
PFAS Substances								
Perfluorooactanoic acid (PFOA) [4]	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Perfluorooctane sulfonate (PFOS) [4]	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Perfluorobutanoate (PFBA)	30	30	30	30	30	30	30	30
Perfluorobutane sulfonate (PFBS)	15	15	15	15	15	15	15	15
Perfluorohexanesulfonate (PFHxS)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Perfluoropentanoate (PFPeA)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Perfluorohexanoate (PFHxA)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Perfluoroheptanoate (PFHpA)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Perfluorononanoate (PFNA)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Other Parameters								
Polychlorinated Biphenyl (Total PCB)	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Dioxins and Furans (TEQ)	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
Pentachlorophenol (PCP)	60	60	60	60	60	60	60	60
Organotins - Tributyltin	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Ethylene Glycol	31,000	31,000	31,000	31,000	31,000	31,000	31,000	31,000
Propylene Glycol	-	-	-	-	-	-	-	-
Phenol	570	570	570	570	570	570	570	570

Notes:

[1] All values in µg/L unless otherwise noted.

[2] "-" indicates no guideline available; "NGR" indicates no guideline required; For Tier I EQS, the Upper Concentration Limit (UCL) of 20,000 ug/L in water is applied to any petroleum hydrocarbon value that is >SOL (solubility) or exceeds 20,000 ug/L, following Atlantic RBCA guidance.

[3] For Tier I EQS, Health Canada AO and OG values are excluded from consideration; as such, "NG" (no guideline) is indicated.

[4] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Non-potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Inorganic Parameters								
Aluminum	-	-	-	-	-	-	-	-
Antimony	-	-	-	-	-	-	-	-
Arsenic	-	-	-	-	-	-	-	-
Barium	-	-	-	-	-		-	
Beryllium	-	-	-	-	-	-	-	-
Boron	-	-	-	-	-	-	-	-
Cadmium	-	-	-	-	-	-	-	-
Chromium (hexavalent)	-	-	-	-	-	-	-	-
Chromium (total)	-	-	-	-	-	-	-	-
Cobalt	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Cyanide	-	-	-	-	-	-	-	-
Iron	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Manganese	-	-	-	-	-	-	-	-
Mercury (total)	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Strontium	-	-	-	-	-	-	-	-
Thallium	-	-	-	-	-	-	-	-
Tin	-	-	-	-	-	-	-	-
Uranium	-	-	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
General Chemistry Parameters								
Chloride	-	-	-	-	-	-	-	-
Sodium	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons (PHC) Parameters								
Benzene	2,700	530	2,700	530	20,000	6300	20,000	6300
Toluene	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Ethylbenzene	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Xylene	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Modified TPH (Gas)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Modified TPH (Fuel)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Modified TPH (Lube)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
MTBE	6100	340	6100	340	40,000	4300	40,000	4300
Polycyclic Aromatic Hydrocarbons (PAH) Parameters								
Non-Carcinogenic PAH Compounds								
Naphthalene	NGR	7000	NGR	7000	NGR	7000	NGR	7000
1 - Methylnaphthalene	-	-	-	-	-	-	-	-
2 - Methylnaphthalene	-	-	-	-	-	-	-	-
Acenaphthene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Non-potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Acenaphthylene	1200	360	1200	360	17,000	7500	17,000	7500
Anthracene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Fluoranthene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Fluorene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Phenanthrene	-	-	-	-	-	-	-	-
Pyrene	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Carcinogenic PAH Compounds								
BaP Total Potency Equivalents (BaP TPE)	-	-	-	-	-	-	-	-
Benz[a]anthracene	-	-	-	-	-	-	-	-
Benzo[a]pyrene	-	-	-	-	-	-	-	-
Benzo[b,j,k]fluoranthene isomers	-	-	-	-	-	-	-	-
Benzo[g,h,i]perylene	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-
Dibenz[a,h]anthracene	-	-	-	-	-	-	-	-
Indeno[1,2,3-c,d]pyrene	-	-	-	-	-	-	-	-
Volatile Organic Compound (VOC) Parameters								
Bromodichloromethane	-	-	-	-	-	-	-	-
Bromoform	7700	3800	7700	3800	130,000	84,000	130,000	84,000
Bromomethane	56	5.6	56	5.6	230	33	230	33
Carbon Tetrachloride (Tetrachloromethane)	12	0.57	12	0.57	80	6.9	80	6.9
Chlorobenzene	300	14	300	14	2200	180	2200	180
Chloroethane	-	-	-	-	-	-	-	-
Chloroform	530	30	530	30	3500	380	3500	380
Chloromethane	-	-	-	-	-	-	-	-
Dibromochloromethane	26,000	1100	26,000	1100	250,000	10,000	250,000	10,000
1,2-Dichlorobenzene	116,000	5400	116,000	5400	NGR	64,000	NGR	64,000
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	4600	220	4600	220	32,000	2600	32,000	2600
1,1-Dichloroethane	3100	320	3100	320	44,000	6600	44,000	6600
1,2-Dichloroethane	170	10	170	10	1200	130	1200	130
1,1-Dichloroethylene	4600	950	4600	950	27,000	5600	27,000	5600
cis-1,2-Dichloroethylene	3900	770	3900	770	23,000	4600	23,000	4600
trans-1,2-Dichloroethylene	4100	820	4100	820	25,000	4900	25,000	4900
1,2-Dichloropropane	140	16	140	16	2000	330	2000	330
1,3-Dichloropropene	45	5.2	45	5.2	610	100	610	100
Ethylene Dibromide	8.3	2.5	8.3	2.5	120	51	120	51
Methylene Chloride (Dichloromethane)	61,000	3400	61,000	3400	410,000	43,000	410,000	43,000
Styrene	11,000	1300	11,000	1300	160,000	26,000	160,000	26,000
1,1,1,2- Tetrachloroethane	280	33	280	33	3800	660	3800	660
1,1,2,2-Tetrachloroethane	150	32	150	32	2100	630	2100	630
Tetrachloroethylene	1000	210	1000	210	5900	1200	5900	1200
1,1,1-Trichloroethane	6700	640	6700	640	95,000	13,000	95,000	13,000
1,1,2-Trichloroethane	300	47	300	47	4100	910	4100	910
Trichloroethylene	92	19	92	19	540	110	540	110
Vinyl Chloride	41	8.6	41	8.6	470	99	940	200

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Non-potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Pesticides								
Aldicarb	-	-	-	-	-	-	-	-
Aldrin	-	-	-	-	-	-	-	-
Atrazine	-	-	-	-	-	-	-	-
Azinphos-methyl	-	-	-	-	-	-	-	-
Bendiocarb	-	-	-	-	-	-	-	-
Bromoxynil	-	-	-	-	-	-	-	-
Carbaryl	-	-	-	-	-	-	-	-
Carbofuran	-	-	-	-	-	-	-	-
Chlorothalonil	-	-	-	-	-	-	-	-
Chlorpyrifos	-	-	-	-	-	-	-	-
Cyanazine	-	-	-	-	-	-	-	-
2,4-D	-	-	-	-	-	-	-	-
DDT	-	-	-	-	-	-	-	-
Diazinon	-	-	-	-	-	-	-	-
Dicamba	-	-	-	-	-	-	-	-
Dichlorfop-methyl	-	-	-	-	-	-	-	-
Dieldrin	-	-	-	-	-	-	-	-
Dimethoate	-	-	-	-	-	-	-	-
Dinoseb	-	-	-	-	-	-	-	-
Diquat	-	-	-	-	-	-	-	-
Diuron	-	-	-	-	-	-	-	-
Endosulfan	-	-	-	-	-	-	-	-
Endrin	-	-	-	-	-	-	-	-
Glyphosate	-	-	-	-	-	-	-	-
Heptachlor	4.3	0.24	4.3	0.24	51	2	51	2
Lindane	-	-	-	-	-	-	-	-
Linuron	-	-	-	-	-	-	-	-
Malathion	-	-	-	-	-	-	-	-
MCPA	-	-	-	-	-	-	-	-
Methoxychlor	-	-	-	-	-	-	-	-
Metolachlor	-	-	-	-	-	-	-	-
Metribuzin	-	-	-	-	-	-	-	-
Paraquat	-	-	-	-	-	-	-	-
Parathion	-	-	-	-	-	-	-	-
Phorate	-	-	-	-	-	-	-	-
Picloram	-	-	-	-	-	-	-	-
Simazine	-	-	-	-	-	-	-	-
Tebuthiuron	-	-	-	-	-	-	-	-
Terbufos	-	-	-	-	-	-	-	-
Toxaphene	6400	310	6400	310	75,000	2900	75,000	2900
Triallate	-	-	-	-	-	-	-	-
Trifluralin	-	-	-	-	-	-	-	-

Atlantic RBCA - Human Health-Based Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses; Non-potable Groundwater Condition (µg/L)

Land Use	Agricultural		Residential / Parkland		Commercial		Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
PFAS Substances								
Perfluorooactanoic acid (PFOA) [4]	-	-	-	-	-	-	-	-
Perfluorooctane sulfonate (PFOS) [4]	-	-	-	-	-	-	-	-
Perfluorobutanoate (PFBA)	-	-	-	-	-	-	-	-
Perfluorobutane sulfonate (PFBS)	-	-	-	-	-	-	-	-
Perfluorohexanesulfonate (PFHxS)	-	-	-	-	-	-	-	-
Perfluoropentanoate (PFPeA)	-	-	-	-	-	-	-	-
Perfluorohexanoate (PFHxA)	-	-	-	-	-	-	-	-
Perfluoroheptanoate (PFHpA)	-	-	-	-	-	-	-	-
Perfluorononanoate (PFNA)	-	-	-	-	-	-	-	-
Other Parameters								
Polychlorinated Biphenyl (Total PCB)	150	78	150	78	250	180	250	180
Dioxins and Furans (TEQ)	0.023	0.014	0.023	0.014	0.45	0.37	0.45	0.37
Pentachlorophenol (PCP)	-	-	-	-	-	-	-	-
Organotins - Tributyltin	-	-	-	-	-	-	-	-
Ethylene Glycol	NGR	NGR	NGR	NGR	NGR	NGR	NGR	NGR
Propylene Glycol	-	-	-	-	-	-	-	-
Phenol	73,000,000	3,700,000	73,000,000	3,700,000	NGR	45,000,000	NGR	45,000,000

Notes:

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[3] For Tier I EQS, Health Canada AO and OG values are excluded from consideration; as such, "NG" (no guideline) is indicated.

[4] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Agricultural Land Use (mg/kg)

Land Use	Agricultural							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
Inorganic Parameters								
Aluminum	15 400	USEPA, 2019 [5]	-	-		-	-	
Antimony	7.5	MOECC, 2011	-	-		-	-	
Arsenic	31	CCME [4]	-	-		10	10	BC CSR Schedule 3.1
Barium	6800	CCME	-	-		350	350	BC CSR Schedule 3.1
Beryllium	75	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1
Boron (Total)	4300	MOECC, 2011	-	-		-	-	
Boron (mg/L in saturated paste extract)	7500	AEP, 2019	-	-		65	118	AEP, 2019
Cadmium	1.4	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1
Chromium (hexavalent)	160	MOECC, 2011	-	-		60	60	BC CSR Schedule 3.1
Chromium (total)	220	CCME	-	-		>1 000 000	>1 000 000	BC CSR Schedule 3.1
Cobalt	22	MOECC, 2011	-	-		25	25	BC CSR Schedule 3.1
Copper	1100	CCME	-	-		250 [10]	250 [10]	BC CSR Schedule 3.1
Cyanide	29	CCME	-	-		6.5	6.5	BC CSR Schedule 3.1
Iron	11 000	USEPA, 2019 [5]	-	-		-	-	
Lead	140	CCME	-	-		120	120	BC CSR Schedule 3.1
Manganese	360	USEPA, 2019 [5]	-	-		2000	2000	BC CSR Schedule 3.1
Mercury (total)	6.6	CCME	-	-		-	-	
Molybdenum	110	MOECC, 2011	-	-		15	15	BC CSR Schedule 3.1
Nickel	200	CCME	-	-		70 [10]	70 [10]	BC CSR Schedule 3.1
Selenium	80	CCME	-	-		1	1	BC CSR Schedule 3.1
Silver	77	MOECC, 2011	-	-		-	-	
Strontium	9400	USEPA, 2019 [5]	-	-		-	-	
Thallium	1	CCME	-	-		-	-	
Tin	9400	USEPA, 2019 [5]	-	-		-	-	
Uranium	23	CCME	-	-		30	30	BC CSR Schedule 3.1
Vanadium	39	MOECC, 2011	-	-		100	100	BC CSR Schedule 3.1
Zinc	10 000	CCME	-	-		200 [10]	200 [10]	BC CSR Schedule 3.1
General Chemistry Parameters								
Chloride	>1 000 000	BC CSR Schedule 3.1	-	-		100	100	BC CSR Schedule 3.1
Sodium	>1 000 000	BC CSR Schedule 3.1	-	-		15 000	15 000	BC CSR Schedule 3.1
Petroleum Hydrocarbons (PHC) Parameters								
Benzene	180	ARBCA, 2021	0.49	0.021	ARBCA, 2021	0.094	0.042	ARBCA, 2021
Toluene	900	ARBCA, 2021	>RES	47	ARBCA, 2021	0.74	0.35	ARBCA, 2021
Ethylbenzene	2000	ARBCA, 2021	>RES	60	ARBCA, 2021	0.089	0.043	ARBCA, 2021
Xylene	1200	ARBCA, 2021	120	4.9	ARBCA, 2021	1.5	0.73	ARBCA, 2021
Modified TPH (Gas)	15 000	ARBCA, 2021	>RES	75	ARBCA, 2021	1900	940	ARBCA, 2021
Modified TPH (Fuel)	8600	ARBCA, 2021	>RES	320	ARBCA, 2021	4700	1800	ARBCA, 2021
Modified TPH (Lube)	14 000	ARBCA, 2021	>RES	1,800	ARBCA, 2021	>RES	15 000	ARBCA, 2021
MTBE	380	AEP, 2019	1.1	0.046	AEP, 2019	0.044	0.062	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters								
Non-Carcinogenic PAH Compounds								
Naphthalene	1800	AEP, 2019	51	2.2	AEP, 2019	28	53	AEP, 2019

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Agricultural Land Use (mg/kg)

Land Use	Agricultural							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
1 - Methylnaphthalene	72	MOECC, 2011 [9]	-	-		42	30	MOECC, 2011 [9]
2 - Methylnaphthalene		MOECC, 2011 [9]	-	-				MOECC, 2011 [9]
Acenaphthene	5300	AEP, 2019	99 000	3900	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene	78	MOECC, 2011 [4]	33	4.5	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]
Anthracene	24 000	AEP, 2019	NGR	670 000	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene	3500	AEP, 2019	NGR	480 000	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene	2700	AEP, 2019	220 000	8600	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene	-		-	-		24	17	MOECC, 2011
Pyrene	2100	AEP, 2019	NGR	730,000	AEP, 2019	NGR	NGR	AEP, 2019
Carcinogenic PAH Compounds								
BaP Total Potency Equivalents	5.3	CCME	NGR	NGR	AEP, 2019	IACR<1.0	IACR<1.0	CCME
Benz[a]anthracene	-		-	-		6.4	12	AEP, 2019
Benzo[a]pyrene	-		-	-		7.0	14	AEP, 2019
Benzo[b,j,k]fluoranthene isomers	-		-	-		0.64	1.2	AEP, 2019
Benzo[g,h,i]perylene	-		-	-		130	250	AEP, 2019
Chrysene	-		-	-		40	78	AEP, 2019
Dibenz[a,h]anthracene	-		-	-		4.4	8.8	AEP, 2019
Indeno[1,2,3-c,d]pyrene	-		-	-		51	98	AEP, 2019
Volatile Organic Compound (VOC) Parameters								
Bromodichloromethane	130	MOECC, 2011 [4]	-	-		1.9	1.5	MOECC, 2011
Bromoform	1000	MOECC, 2011 [4]	2.6	2.7	MOECC, 2011 [4]	2.9	2.3	MOECC, 2011
Bromomethane*	20	BC CSR Schedule 3.1	0.0034	0.00034	MOECC, 2011	0.1	0.097	MOECC, 2011
Carbon Tetrachloride (Tetrachloromethane)*	27	AEP, 2019	0.013	0.00057	AEP, 2019	0.037	0.062	AEP, 2019
Chlorobenzene	16 000	AEP, 2019	0.39	0.018	AEP, 2019	0.61	1.1	AEP, 2019
Chloroethane	-		-	-		-	-	
Chloroform	72	AEP, 2019	0.22	0.011	AEP, 2019	0.53	0.88	AEP, 2019
Chloromethane	-		-	-		-	-	
Dibromochloromethane	760	AEP, 2019	7.8	0.27	AEP, 2019	0.91	1.5	AEP, 2019
1,2-Dichlorobenzene	16 000	AEP, 2019	230	10	AEP, 2019	0.097	0.18	AEP, 2019
1,3-Dichlorobenzene	420	MOECC, 2011	-	-		34	24	MOECC, 2011
1,4-Dichlorobenzene	4200	AEP, 2019	14	0.67	AEP, 2019	0.051	0.098	AEP, 2019
1,1-Dichloroethane	8500	BC CSR Schedule 3.1	31	3.5	MOECC, 2011	0.6	0.47	MOECC, 2011
1,2-Dichloroethane*	2800	AEP, 2019	0.055	0.0027	AEP, 2019	0.025	0.041	AEP, 2019
1,1-Dichloroethylene*	110	ARBCA, 2021	0.93	0.039	ARBCA, 2021	0.38	0.17	ARBCA, 2021
cis-1,2-Dichloroethylene*	74	ARBCA, 2021	0.52	0.019	ARBCA, 2021	1.0	0.42	ARBCA, 2021
trans-1,2-Dichloroethylene*	740	ARBCA, 2021	0.56	0.02	ARBCA, 2021	1.4	0.58	ARBCA, 2021
1,2-Dichloropropane	600	BC CSR Schedule 3.1	0.085	0.01	MOECC, 2011	0.74	0.54	MOECC, 2011
1,3-Dichloropropene	1000	BC CSR Schedule 3.1	0.83	0.27	MOECC, 2011 [4]	0.81	0.27	MOECC, 2011 [4]
Ethylene Dibromide*	2.2	MOECC, 2011 [4]	0.0054	0.014	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011
Methylene Chloride (Dichloromethane)	990	AEP, 2019	16	0.71	AEP, 2019	0.21	0.32	AEP, 2019
Styrene	2500	MOECC, 2011	19	16	MOECC, 2011	66	47	MOECC, 2011
1,1,1,2-Tetrachloroethane	250	BC CSR Schedule 3.1	0.46	0.58	MOECC, 2011 [4]	0.2	0.15	MOECC, 2011

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Agricultural Land Use (mg/kg)

Land Use	Agricultural							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
1,1,2,2-Tetrachloroethane	35	BC CSR Schedule 3.1	0.096	0.045	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011
Tetrachloroethylene*	170	ARBCA, 2021	0.39	0.016	ARBCA, 2021	0.57	0.27	ARBCA, 2021
1,1,1-Trichloroethane	85 000	BC CSR Schedule 3.1	3.4	0.38	MOECC, 2011	27	20	MOECC, 2011
1,1,2-Trichloroethane	150	BC CSR Schedule 3.1	0.18	0.3	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011
Trichloroethylene*	54	ARBCA, 2021	0.02	0.00081	ARBCA, 2021	0.13	0.061	ARBCA, 2021
Vinyl Chloride*	31	ARBCA, 2021	0.0087	0.00031	ARBCA, 2021	0.060	0.021	ARBCA, 2021
Pesticides								
Aldicarb	22	AEP, 2019	-	-		0.041	0.065	AEP, 2019
Aldrin	3.4	AEP, 2019	-	-		5.9	11	AEP, 2019
Atrazine	11	AEP, 2019	-	-		0.10	0.17	AEP, 2019
Azinphos-methyl	55	AEP, 2019	-	-		0.41	0.75	AEP, 2019
Bendiocarb	89	AEP, 2019	-	-		0.14	0.21	AEP, 2019
Bromoxynil	11	AEP, 2019	-	-		0.18	0.35	AEP, 2019
Carbaryl	220	AEP, 2019	-	-		1.9	3.6	AEP, 2019
Carbofuran	220	AEP, 2019	-	-		0.68	1.2	AEP, 2019
Chlorothalonil	330	AEP, 2019	-	-		27	53	AEP, 2019
Chlorpyrifos	220	AEP, 2019	-	-		49	95	AEP, 2019
Cyanazine	29	AEP, 2019	-	-		0.12	0.21	AEP, 2019
2,4-D	220	AEP, 2019	-	-		0.43	0.69	AEP, 2019
DDT	220	AEP, 2019	-	-		5,900	11,000	AEP, 2019
Diazinon	44	AEP, 2019	-	-		2.2	4.2	AEP, 2019
Dicamba	280	AEP, 2019	-	-		0.5	0.79	AEP, 2019
Dichlorfop-methyl	22	AEP, 2019	-	-		NGR	NGR	AEP, 2019
Dieldrin	3.4	AEP, 2019	-	-		0.59	11	AEP, 2019
Dimethoate	44	AEP, 2019	-	-		0.077	0.12	AEP, 2019
Dinoseb	22	AEP, 2019	-	-		2.8	5.5	AEP, 2019
Diquat	180	AEP, 2019	-	-		11	21	AEP, 2019
Diuron	350	AEP, 2019	-	-		1.9	3.5	AEP, 2019
Endosulfan	210	AEP, 2019	-	-		99	190	AEP, 2019
Endrin	10	AEP, 2019	-	-		2.4	4.7	AEP, 2019
Glyphosate	670	AEP, 2019	-	-		0.95	1.4	AEP, 2019
Heptachlor	0.46	AEP, 2019	0.21	0.012	AEP, 2019	0.039	0.076	AEP, 2019
Lindane	6.7	AEP, 2019	-	-		0.31	0.6	AEP, 2019
Linuron	44	AEP, 2019	-	-		0.56	1.1	AEP, 2019
Malathion	440	AEP, 2019	-	-		0.82	1.3	AEP, 2019
MCPA	460	AEP, 2019	-	-		0.42	0.66	AEP, 2019
Methoxychlor	3500	AEP, 2019	-	-		NGR	NGR	AEP, 2019
Metolachlor	110	AEP, 2019	-	-		1.3	2.4	AEP, 2019
Metribuzin	180	AEP, 2019	-	-		7.8	15	AEP, 2019
Paraquat	22	AEP, 2019	-	-		1.1	2.2	AEP, 2019
Parathion	110	AEP, 2019	-	-		7.2	14	AEP, 2019
Phorate	4.4	AEP, 2019	-	-		0.075	0.14	AEP, 2019

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Agricultural Land Use (mg/kg)

Land Use	Agricultural							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
Picloram	440	AEP, 2019	-	-		0.64	0.94	AEP, 2019
Simazine	29	AEP, 2019	-	-		0.14	0.25	AEP, 2019
Tebuthiuron	1600	AEP, 2019	-	-		2.5	3.7	AEP, 2019
Terbufos	1.1	AEP, 2019	-	-		0.08	0.015	AEP, 2019
Toxaphene	4.8	AEP, 2019	3100	170	AEP, 2019	3.3	6.3	AEP, 2019
Triallate	290	AEP, 2019	-	-		16	31	AEP, 2019
Trifluralin	110	AEP, 2019	-	-		NGR	NGR	AEP, 2019
PFAS Substances								
Perfluorooactanoic acid (PFOA)	0.70 [8]	HC, 2019	-	-		-	-	
Perfluorooctane sulfonate (PFOS)	2.1 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1
Perfluorobutanoate (PFBA)	114	HC, 2019	-	-		-	-	
Perfluorobutane sulfonate (PFBS)	61	HC, 2019	-	-		-	-	
Perfluorohexanesulfonate (PFHxS)	2.3	HC, 2019	-	-		-	-	
Perfluoropentanoate (PFPeA)	0.8	HC, 2019	-	-		-	-	
Perfluorohexanoate (PFHxA)	0.8	HC, 2019	-	-		-	-	
Perfluoroheptanoate (PFHpA)	0.8	HC, 2019	-	-		-	-	
Perfluorononanoate (PFNA)	0.08	HC, 2019	-	-		-	-	
Other Parameters								
Polychlorinated Biphenyl (Total PCB)	22	AEP, 2019	190	31	MOECC, 2011 [4]	1100	770	MOECC, 2011
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000004	CCME	0.017	0.0028	MOECC, 2011	0.0026	0.0018	MOECC, 2011
Pentachlorophenol (PCP)	93	CCME	66 000	66 000	CCME	7.6	7.6	CCME
Organotins - Tributyltin	3.8	USEPA, 2019 [5]	-	-		-	-	
Ethylene Glycol	73 000	AEP, 2019	NGR	86 000	AEP, 2019	60	68	AEP, 2019
Propylene Glycol	-		-	-		-	-	
Phenol	1900	CCME	500	500	CCME	3.8	3.8	CCME

Notes:

[1] All values are in units of mg/kg unless otherwise noted.

[2] "-" indicates no guideline available; >RES means no soil criteria are shown as residual soil saturation limits may be exceeded; IACR means the CCME Index of Additive Cancer Risk for carcinogenic PAHs.

[3] When evaluating human contact with sediments, dry weight chemical concentrations in sediment should be evaluated against the soil quality guidelines for Soil Contact/Ingestion only.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1 x 10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Benzo(a)pyrene (BaP) Total Potency Equivalents (TPE) are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment, 2010 Canadian soil quality guidelines for the protection of environmental and human health: Carcinogenic and Other PAHs."

[7] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[8] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

[9] The guideline is applicable to both 1-methylnaphthalene and 2-methylnaphthalene isomers. If both isomers are detected, the sum of the two must not exceed the guideline.

[10] The BC CSR Schedule 3.1 value is pH-dependent.The lowest value from Schedule 3.1 is presented.

* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Residential / Parkland Land Use (mg/kg)

Land Use	Residential / Parkland							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
Inorganic Parameters								
Aluminum	15 400	USEPA, 2019 [5]	-	-		-	-	
Antimony	7.5	MOECC, 2011	-	-		-	-	
Arsenic	31	CCME [4]	-	-		10	10	BC CSR Schedule 3.1
Barium	6800	CCME	-	-		350	350	BC CSR Schedule 3.1
Beryllium	75	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1
Boron (Total)	4300	MOECC, 2011	-	-		-	-	
Boron (mg/L in saturated paste extract)	7500	AEP, 2019	-	-		65	118	AEP, 2019
Cadmium	14	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1
Chromium (hexavalent)	160	MOECC, 2011	-	-		60	60	BC CSR Schedule 3.1
Chromium (total)	220	CCME	-	-		>1 000 000	>1 000 000	BC CSR Schedule 3.1
Cobalt	22	MOECC, 2011	-	-		25	25	BC CSR Schedule 3.1
Copper	1100	CCME	-	-		250 [10]	250 [10]	BC CSR Schedule 3.1
Cyanide	29	CCME	-	-		6.5	6.5	BC CSR Schedule 3.1
Iron	11 000	USEPA, 2019 [5]	-	-		-	-	
Lead	140	CCME	-	-		120	120	BC CSR Schedule 3.1
Manganese	360	USEPA, 2019 [5]	-	-		2000	2000	BC CSR Schedule 3.1
Mercury (total)	6.6	CCME	-	-		-	-	
Molybdenum	110	MOECC, 2011	-	-		15	15	BC CSR Schedule 3.1
Nickel	200	CCME	-	-		70 [10]	70 [10]	BC CSR Schedule 3.1
Selenium	80	CCME	-	-		1	1	BC CSR Schedule 3.1
Silver	77	MOECC, 2011	-	-		-	-	
Strontium	9400	USEPA, 2019 [5]	-	-		-	-	
Thallium	1	CCME	-	-		-	-	
Tin	9400	USEPA, 2019 [5]	-	-		-	-	
Uranium	23	CCME	-	-		30	30	BC CSR Schedule 3.1
Vanadium	39	MOECC, 2011	-	-		100	100	BC CSR Schedule 3.1
Zinc	10 000	CCME	-	-		200 [10]	200 [10]	BC CSR Schedule 3.1
General Chemistry Parameters								
Chloride	>1 000 000	BC CSR Schedule 3.1	-	-		100	100	BC CSR Schedule 3.1
Sodium	>1 000 000	BC CSR Schedule 3.1	-	-		15 000	15 000	BC CSR Schedule 3.1
Petroleum Hydrocarbons (PHC) Parameters								
Benzene	180	ARBCA, 2021	0.49	0.021	ARBCA, 2021	0.094	0.042	ARBCA, 2021
Toluene	900	ARBCA, 2021	>RES	47	ARBCA, 2021	0.74	0.35	ARBCA, 2021
Ethylbenzene	2000	ARBCA, 2021	>RES	60	ARBCA, 2021	0.089	0.043	ARBCA, 2021
Xylene	1200	ARBCA, 2021	120	4.9	ARBCA, 2021	1.5	0.73	ARBCA, 2021
Modified TPH (Gas)	15 000	ARBCA, 2021	>RES	75	ARBCA, 2021	1,900	940	ARBCA, 2021
Modified TPH (Fuel)	8600	ARBCA, 2021	>RES	320	ARBCA, 2021	4700	1800	ARBCA, 2021
Modified TPH (Lube)	14 000	ARBCA, 2021	>RES	1800	ARBCA, 2021	>RES	15 000	ARBCA, 2021
MTBE	380	AEP, 2019	1.1	0.046	AEP, 2019	0.044	0.062	AEP, 2019

Land Use	Residential / Parkland							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
Polycyclic Aromatic Hydrocarbons (PAH) Parameters								
Non-Carcinogenic PAH Compounds								
Naphthalene	1800	AEP, 2019	51	2.2	AEP, 2019	28	53	AEP, 2019
1 - Methylnaphthalene	72	MOECC, 2011 [9]	-	-		42	30	MOECC, 2011 [9]
2 - Methylnaphthalene		MOECC, 2011 [9]	-	-				MOECC, 2011 [9]
Acenaphthene	5300	AEP, 2019	99 000	3900	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene	78	MOECC, 2011 [4]	33	4.5	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]
Anthracene	24 000	AEP, 2019	NGR	670 000	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene	3500	AEP, 2019	NGR	48 0000	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene	2700	AEP, 2019	220,000	8600	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene	-		-	-		24	17	MOECC, 2011
Pyrene	2100	AEP, 2019	NGR	730 000	AEP, 2019	NGR	NGR	AEP, 2019
Carcinogenic PAH Compounds								
BaP Total Potency Equivalents	5.3	CCME	NGR	NGR	AEP, 2019	IACR<1.0	IACR<1.0	CCME
Benz[a]anthracene	-		-	-		6.4	12	AEP, 2019
Benzo[a]pyrene	-		-	-		7.0	14	AEP, 2019
Benzo[b,j,k]fluoranthene isomers	-		-	-		0.64	1.2	AEP, 2019
Benzo[g,h,i]perylene	-		-	-		130	250	AEP, 2019
Chrysene	-		-	-		40	78	AEP, 2019
Dibenz[a,h]anthracene	-		-	-		4.4	8.8	AEP, 2019
Indeno[1,2,3-c,d]pyrene	-		-	-		51	98	AEP, 2019
Volatile Organic Compound (VOC) Parameters								
Bromodichloromethane	130	MOECC, 2011 [4]	-	-		1.9	1.5	MOECC, 2011
Bromoform	1000	MOECC, 2011 [4]	2.6	2.7	MOECC, 2011 [4]	2.9	2.3	MOECC, 2011
Bromomethane*	20	BC CSR Schedule 3.1	0.0034	0.00034	MOECC, 2011	0.1	0.097	MOECC, 2011
Carbon Tetrachloride (Tetrachloromethane)*	27	AEP, 2019	0.013	0.00057	AEP, 2019	0.037	0.062	AEP, 2019
Chlorobenzene	16 000	AEP, 2019	0.39	0.018	AEP, 2019	0.61	1.1	AEP, 2019
Chloroethane	-		-	-		-	-	
Chloroform	72	AEP, 2019	0.22	0.011	AEP, 2019	0.53	0.88	AEP, 2019
Chloromethane	-		-	-		-	-	
Dibromochloromethane	760	AEP, 2019	7.8	0.27	AEP, 2019	0.91	1.5	AEP, 2019
1,2-Dichlorobenzene	16 000	AEP, 2019	230	10	AEP, 2019	0.097	0.18	AEP, 2019
1,3-Dichlorobenzene	420	MOECC, 2011	-	-	MOECC, 2011	34	24	MOECC, 2011
1,4-Dichlorobenzene	4200	AEP, 2019	14	0.67	AEP, 2019	0.051	0.098	AEP, 2019
1,1-Dichloroethane	8500	BC CSR Schedule 3.1	31	3.5	MOECC, 2011	0.6	0.47	MOECC, 2011
1,2-Dichloroethane*	2800	AEP, 2019	0.055	0.0027	AEP, 2019	0.025	0.041	AEP, 2019
1,1-Dichloroethylene*	110	ARBCA, 2021	0.93	0.039	ARBCA, 2021	0.38	0.17	ARBCA, 2021

Land Use	Residential / Parkland							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
cis-1,2-Dichloroethylene*	74	ARBCA, 2021	0.52	0.019	ARBCA, 2021	1.0	0.42	ARBCA, 2021
trans-1,2-Dichloroethylene*	740	ARBCA, 2021	0.56	0.02	ARBCA, 2021	1.4	0.58	ARBCA, 2021
1,2-Dichloropropane	600	BC CSR Schedule 3.1	0.085	0.01	MOECC, 2011	0.74	0.54	MOECC, 2011
1,3-Dichloropropene	1000	BC CSR Schedule 3.1	0.83	0.27	MOECC, 2011 [4]	0.81	0.59	MOECC, 2011 [4]
Ethylene Dibromide*	2.2	MOECC, 2011 [4]	0.0054	0.014	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011
Methylene Chloride (Dichloromethane)	990	AEP, 2019	16	0.71	AEP, 2019	0.21	0.32	AEP, 2019
Styrene	2500	MOECC, 2011	19	16	MOECC, 2011	66	47	MOECC, 2011
1,1,1,2-Tetrachloroethane	250	BC CSR Schedule 3.1	0.46	0.58	MOECC, 2011 [4]	0.2	0.15	MOECC, 2011
1,1,2,2-Tetrachloroethane	35	BC CSR Schedule 3.1	0.096	0.045	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011
Tetrachloroethylene*	170	ARBCA, 2021	0.39	0.016	ARBCA, 2021	0.57	0.27	ARBCA, 2021
1,1,1-Trichloroethane	85 000	BC CSR Schedule 3.1	3.4	0.38	MOECC, 2011	27	20	MOECC, 2011
1,1,2-Trichloroethane	150	BC CSR Schedule 3.1	0.18	0.3	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011
Trichloroethylene*	54	ARBCA, 2021	0.02	0.00081	ARBCA, 2021	0.13	0.061	ARBCA, 2021
Vinyl Chloride*	31	ARBCA, 2021	0.0087	0.00031	ARBCA, 2021	0.060	0.021	ARBCA, 2021
Pesticides								
Aldicarb	22	AEP, 2019	-	-		0.041	0.065	AEP, 2019
Aldrin	3.4	AEP, 2019	-	-		5.9	11	AEP, 2019
Atrazine	11	AEP, 2019	-	-		0.10	0.19	AEP, 2019
Azinphos-methyl	55	AEP, 2019	-	-		0.41	0.75	AEP, 2019
Bendiocarb	89	AEP, 2019	-	-		0.14	0.21	AEP, 2019
Bromoxynil	11	AEP, 2019	-	-		0.18	0.35	AEP, 2019
Carbaryl	220	AEP, 2019	-	-		1.9	3.6	AEP, 2019
Carbofuran	220	AEP, 2019	-	-		0.68	1.2	AEP, 2019
Chlorothalonil	330	AEP, 2019	-	-		27	53	AEP, 2019
Chlorpyrifos	220	AEP, 2019	-	-		49	95	AEP, 2019
Cyanazine	29	AEP, 2019	-	-		0.12	0.21	AEP, 2019
2,4-D	220	AEP, 2019	-	-		0.43	0.67	AEP, 2019
DDT	220	AEP, 2019	-	-		5900	11,000	AEP, 2019
Diazinon	44	AEP, 2019	-	-		2.2	4.2	AEP, 2019
Dicamba	280	AEP, 2019	-	-		0.5	0.79	AEP, 2019
Dichlorfop-methyl	22	AEP, 2019	-	-		NGR	NGR	AEP, 2019
Dieldrin	3.4	AEP, 2019	-	-		0.59	1.1	AEP, 2019
Dimethoate	44	AEP, 2019	-	-		0.077	0.12	AEP, 2019
Dinoseb	22	AEP, 2019	-	-		2.8	5.5	AEP, 2019
Diquat	180	AEP, 2019	-	-		11	21	AEP, 2019
Diuron	350	AEP, 2019	-	-		1.9	3.5	AEP, 2019

Land Use	Residential / Parkland							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
Endosulfan	210	AEP, 2019	-	-		99	190	AEP, 2019
Endrin	10	AEP, 2019	-	-		2.4	4.7	AEP, 2019
Glyphosate	670	AEP, 2019	-	-		0.95	1.4	AEP, 2019
Heptachlor	0.46	AEP, 2019	0.21	0.012	AEP, 2019	0.039	0.076	AEP, 2019
Lindane	6.7	AEP, 2019	-	-		0.31	0.6	AEP, 2019
Linuron	44	AEP, 2019	-	-		0.56	1.1	AEP, 2019
Malathion	440	AEP, 2019	-	-		0.82	1.3	AEP, 2019
MCPA	460	AEP, 2019	-	-		0.42	0.66	AEP, 2019
Methoxychlor	3500	AEP, 2019	-	-		NGR	NGR	AEP, 2019
Metolachlor	110	AEP, 2019	-	-		1.3	2.4	AEP, 2019
Metribuzin	180	AEP, 2019	-	-		7.8	15	AEP, 2019
Paraquat	22	AEP, 2019	-	-		1.1	2.2	AEP, 2019
Parathion	110	AEP, 2019	-	-		7.2	14	AEP, 2019
Phorate	4.4	AEP, 2019	-	-		0.075	0.14	AEP, 2019
Picloram	440	AEP, 2019	-	-		0.64	0.94	AEP, 2019
Simazine	29	AEP, 2019	-	-		0.14	0.25	AEP, 2019
Tebuthiuron	1600	AEP, 2019	-	-		2.5	3.7	AEP, 2019
Terbufos	1.1	AEP, 2019	-	-		0.08	0.15	AEP, 2019
Toxaphene	4.8	AEP, 2019	3100	170	AEP, 2019	3.3	6.3	AEP, 2019
Triallate	290	AEP, 2019	-	-		16	31	AEP, 2019
Trifluralin	110	AEP, 2019	-	-		NGR	NGR	AEP, 2019
PFAS Substances								
Perfluorooactanoic acid (PFOA)	0.70 [8]	HC, 2019	-	-		-	-	
Perfluorooctane sulfonate (PFOS)	2.1 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1
Perfluorobutanoate (PFBA)	114	HC, 2019	-	-		-	-	
Perfluorobutane sulfonate (PFBS)	61	HC, 2019	-	-		-	-	
Perfluorohexanesulfonate (PFHxS)	2.3	HC, 2019	-	-		-	-	
Perfluoropentanoate (PFPeA)	0.8	HC, 2019	-	-		-	-	
Perfluorohexanoate (PFHxA)	0.8	HC, 2019	-	-		-	-	
Perfluoroheptanoate (PFHpA)	0.8	HC, 2019	-	-		-	-	
Perfluorononanoate (PFNA)	0.08	HC, 2019	-	-		-	-	
Other Parameters								
Polychlorinated Biphenyl (Total PCB)	22	AEP, 2019	190	31	MOECC, 2011 [4]	1100	770	MOECC, 2011
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000004	CCME	0.017	0.0028	MOECC, 2011	0.0026	0.0018	MOECC, 2011
Pentachlorophenol (PCP)	93	CCME	66 000	66 000	CCME	7.6	7.6	CCME
Organotins - Tributyltin	3.8	USEPA, 2019 [5]	-	-		-	-	
Ethylene Glycol	73 000	AEP, 2019	NGR	86 000	AEP, 2019	60	68	AEP, 2019

Land Use	Residential / Parkland							
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference
Propylene Glycol	-		-	-		-	-	
Phenol	1900	CCME	500	500	CCME	3.8	3.8	CCME

Notes:

[1] All values are in units of mg/kg unless otherwise noted.

[2] "-" indicates no guideline available; >RES means no soil criteria are shown as residual soil saturation limits may be exceeded; IACR means the CCME Index of Additive Cancer Risk for carcinogenic PAHs.

[3] When evaluating human contact with sediments, dry weight chemical concentrations in sediment should be evaluated against the soil quality guidelines for Soil Contact/Ingestion only.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1×10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Benzo(a)pyrene (BaP) Total Potency Equivalents (TPE) are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment, 2010 Canadian soil quality guidelines for the protection of environmental and human health: Carcinogenic and Other PAHs."

[7] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[8] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

[9] The guideline is applicable to both 1-methylnaphthalene and 2-methylnaphthalene isomers. If both isomers are detected, the sum of the two must not exceed the guideline.

[10] The BC CSR Schedule 3.1 value is pH-dependent.The lowest value from Schedule 3.1 is presented.

* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Commercial Land Use (mg/kg)

Land Use	Commercial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Inorganic Parameters										
Aluminum	15 400	USEPA, 2019 [5]	-	-		-	-		-	
Antimony	7.5	MOECC, 2011	-	-		-	-		-	
Arsenic	31	CCME [4]	-	-		10	10	BC CSR Schedule 3.1	-	
Barium	10 000	CCME	-	-		350	350	BC CSR Schedule 3.1	96 000	CCME
Beryllium	110	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	1100	CCME
Boron (Total)	4300	MOECC, 2011	-	-		-	-		-	
Boron (mg/L in saturated paste extract)	11 000	AEP, 2019	-	-		65	118	AEP, 2019	110 000	AEP, 2019
Cadmium	49	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	-	
Chromium (hexavalent)	160	MOECC, 2011	-	-		60	60	BC CSR Schedule 3.1	-	
Chromium (total)	630	CCME	-	-		>1 000 000	>1 000 000	BC CSR Schedule 3.1	-	
Cobalt	22	MOECC, 2011	-	-		25	25	BC CSR Schedule 3.1	-	
Copper	4000	CCME	-	-		250 [10]	250 [10]	BC CSR Schedule 3.1	-	
Cyanide	110	CCME	-	-		6.5	6.5	BC CSR Schedule 3.1	-	
Iron	11 000	USEPA, 2019 [5]	-	-		-	-		-	
Lead	260	CCME	-	-		120	120	BC CSR Schedule 3.1	-	
Manganese	360	USEPA, 2019 [5]	-	-		2000	2000	BC CSR Schedule 3.1	-	
Mercury (total)	24	CCME	-	-		-	-		-	
Molybdenum	110	MOECC, 2011	-	-		15	15	BC CSR Schedule 3.1	-	
Nickel	310	CCME	-	-		70 [10]	70 [10]	BC CSR Schedule 3.1	2500	CCME
Selenium	125	CCME	-	-		1	1	BC CSR Schedule 3.1	1135	CCME
Silver	77	MOECC, 2011	-	-		-	-		-	
Strontium	9400	USEPA, 2019 [5]	-	-		-	-		-	
Thallium	1	CCME	-	-		-	-		-	
Tin	9400	USEPA, 2019 [5]	-	-		-	-		-	
Uranium	33	CCME	-	-		30	30	BC CSR Schedule 3.1	-	
Vanadium	39	MOECC, 2011	-	-		100	100	BC CSR Schedule 3.1	-	
Zinc	16 000	CCME	-	-		200 [10]	200 [10]	BC CSR Schedule 3.1	140 000	CCME
General Chemistry Parameters										
Chloride	>1 000 000	BC CSR Schedule 3.1	-	-		100	100	BC CSR Schedule 3.1	-	
Sodium	>1 000 000	BC CSR Schedule 3.1	-	-		15,000	15,000	BC CSR Schedule 3.1	-	
Petroleum Hydrocarbons (PHC) Parameters										
Benzene	980	ARBCA, 2021	6.9	0.52	ARBCA, 2021	0.094	0.042	ARBCA, 2021	1100	AEP, 2019
Toluene	1400	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.74	0.35	ARBCA, 2021	9200	AEP, 2019
Ethylbenzene	3100	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.089	0.043	ARBCA, 2021	24 000	AEP, 2019
Xylene	1800	ARBCA, 2021	>RES	60	ARBCA, 2021	1.5	0.73	ARBCA, 2021	6900	AEP, 2019
Modified TPH (Gas)	22 000	ARBCA, 2021	>RES	2000	ARBCA, 2021	1900	940	ARBCA, 2021	-	
Modified TPH (Fuel)	13 000	ARBCA, 2021	>RES	32000	ARBCA, 2021	4700	1800	ARBCA, 2021	-	
Modified TPH (Lube)	21 000	ARBCA, 2021	>RES	>RES	ARBCA, 2021	>RES	15 000	ARBCA, 2021	-	
MTBE	580	AEP, 2019	7.4	0.57	AEP, 2019	0.044	0.062	AEP, 2019	5400	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters										
Non-Carcinogenic PAH Compounds										
Naphthalene	2800	AEP, 2019	370	25	AEP, 2019	28	53	AEP, 2019	26 000	AEP, 2019
1 - Methylnaphthalene	72	MOECC, 2011 [9]	-	-		42	30	MOECC, 2011 [9]	-	
2 - Methylnaphthalene		MOECC, 2011 [9]	-	-				MOECC, 2011 [9]	-	
Acenaphthene	8000	AEP, 2019	770 000	43 000	AEP, 2019	NGR	NGR	AEP, 2019	75 000	AEP, 2019
Acenaphthylene	78	MOECC, 2011 [4]	390	66	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]	-	
Anthracene	37 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	350 000	AEP, 2019

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Commercial Land Use (mg/kg)

Land Use	Commercial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Fluoranthene	5300	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	50 000	AEP, 2019
Fluorene	4100	AEP, 2019	NGR	91 000	AEP, 2019	NGR	NGR	AEP, 2019	39 000	AEP, 2019
Phenanthrene	-		-	-		24	17	MOECC, 2011	-	
Pyrene	3200	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	30 000	AEP, 2019
Carcinogenic PAH Compounds										
BaP Total Potency Equivalents	5.3	CCME	NGR	NGR	AEP, 2019	IACR<1.0	IACR<1.0	CCME	-	
Benz[a]anthracene	-		-	-		6.4	12	AEP, 2019	-	
Benzo[a]pyrene	-		-	-		7.0	14	AEP, 2019	-	
Benzo[b,j,k]fluoranthene isomers	-		-	-		0.64	1.2	AEP, 2019	-	
Benzo[g,h,i]perylene	-		-	-		130	250	AEP, 2019	-	
Chrysene	-		-	-		40	78	AEP, 2019	-	
Dibenz[a,h]anthracene	-		-	-		4.4	8.8	AEP, 2019	-	
Indeno[1,2,3-c,d]pyrene	-		-	-		51	98	AEP, 2019	-	
Volatile Organic Compound (VOC) Parameters										
Bromodichloromethane	130	MOECC, 2011 [4]	-	-		1.9	1.5	MOECC, 2011	-	
Bromoform	1000	MOECC, 2011 [4]	17	6.1	MOECC, 2011 [4]	2.9	2.3	MOECC, 2011	-	
Bromomethane*	300	BC CSR Schedule 3.1	0.012	0.0016	MOECC, 2011	0.1	0.097	MOECC, 2011	-	
Carbon Tetrachloride (Tetrachloromethane)*	41	AEP, 2019	0.092	0.0069	AEP, 2019	0.037	0.062	AEP, 2019	380	AEP, 2019
Chlorobenzene	25 000	AEP, 2019	2.7	0.22	AEP, 2019	0.61	1.1	AEP, 2019	230 000	AEP, 2019
Chloroethane	-		-	-		-	-		-	
Chloroform	110	AEP, 2019	1.5	0.14	AEP, 2019	0.53	0.88	AEP, 2019	1000	AEP, 2019
Chloromethane	-		-	-		-	-		-	
Dibromochloromethane	1200	AEP, 2019	76	2.5	AEP, 2019	0.91	1.5	AEP, 2019	11 000	AEP, 2019
1,2-Dichlorobenzene	25 000	AEP, 2019	1700	130	AEP, 2019	0.097	0.18	AEP, 2019	230 000	AEP, 2019
1,3-Dichlorobenzene	420	MOECC, 2011	-	-		34	24	MOECC, 2011	-	
1,4-Dichlorobenzene	6200	AEP, 2019	100	8	AEP, 2019	0.051	0.098	AEP, 2019	59 000	AEP, 2019
1,1-Dichloroethane	50 000	BC CSR Schedule 3.1	39	56	MOECC, 2011	0.6	0.47	MOECC, 2011	-	
1,2-Dichloroethane	4200	AEP, 2019	0.37	0.033	AEP, 2019	0.025	0.041	AEP, 2019	40 000	AEP, 2019
1,1-Dichloroethylene	170	ARBCA, 2021	6.6	0.49	ARBCA, 2021	0.38	0.17	ARBCA, 2021	27 000	AEP, 2019
cis-1,2-Dichloroethylene	110	ARBCA, 2021	3.8	0.24	ARBCA, 2021	1.0	0.42	ARBCA, 2021	-	
trans-1,2-Dichloroethylene	1100	ARBCA, 2021	4.1	0.25	ARBCA, 2021	1.4	0.58	ARBCA, 2021	-	
1,2-Dichloropropane	3500	BC CSR Schedule 3.1	0.68	0.16	MOECC, 2011	0.74	0.54	MOECC, 2011	-	
1,3-Dichloropropene	7500	BC CSR Schedule 3.1	2.1	1.8	MOECC, 2011 [4]	0.81	0.59	MOECC, 2011 [4]	-	
Ethylene Dibromide*	2.2	MOECC, 2011 [4]	0.019	0.015	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011	-	
Methylene Chloride (Dichloromethane)	1500	AEP, 2019	110	9.0	AEP, 2019	0.21	0.32	AEP, 2019	14 000	AEP, 2019
Styrene	2500	MOECC, 2011	170	42	MOECC, 2011	66	47	MOECC, 2011	-	
1,1,1,2-Tetrachloroethane	1500	BC CSR Schedule 3.1	1.1	0.87	MOECC, 2011 [4]	0.2	0.15	MOECC, 2011	-	
1,1,2,2-Tetrachloroethane	150	BC CSR Schedule 3.1	0.94	0.19	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011	-	
Tetrachloroethylene	270	ARBCA, 2021	2.9	0.2	ARBCA, 2021	0.57	0.27	ARBCA, 2021	2600	AEP, 2019
1,1,1-Trichloroethane	500 000	BC CSR Schedule 3.1	42	6.1	MOECC, 2011	27	20	MOECC, 2011	-	
1,1,2-Trichloroethane	1000	BC CSR Schedule 3.1	1.1	0.42	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011	-	
Trichloroethylene*	82	ARBCA, 2021	0.14	0.01	ARBCA, 2021	0.13	0.061	ARBCA, 2021	500	AEP, 2019
Vinyl Chloride	170	ARBCA, 2021	0.12	0.0079	ARBCA, 2021	0.060	0.021	ARBCA, 2021	1000	AEP, 2019
Pesticides										
Aldicarb	34	AEP, 2019	-	-		0.041	0.065	AEP, 2019	320	AEP, 2019
Aldrin	5.1	AEP, 2019	-	-		5.9	11	AEP, 2019	49	AEP, 2019
Atrazine	17	AEP, 2019	-	-		0.10	0.19	AEP, 2019	160	AEP, 2019
Azinphos-methyl	84	AEP, 2019	-	-		0.41	0.75	AEP, 2019	790	AEP, 2019

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Commercial Land Use (mg/kg)

Land Use	Commercial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Bendiocarb	130	AEP, 2019	-	-		0.14	0.21	AEP, 2019	1300	AEP, 2019
Bromoxynil	17	AEP, 2019	-	-		0.18	0.35	AEP, 2019	160	AEP, 2019
Carbaryl	340	AEP, 2019	-	-		1.9	3.6	AEP, 2019	3200	AEP, 2019
Carbofuran	340	AEP, 2019	-	-		0.68	1.2	AEP, 2019	3200	AEP, 2019
Chlorothalonil	500	AEP, 2019	-	-		27	53	AEP, 2019	4800	AEP, 2019
Chlorpyrifos	340	AEP, 2019	-	-		49	95	AEP, 2019	3200	AEP, 2019
Cyanazine	44	AEP, 2019	-	-		0.12	0.21	AEP, 2019	410	AEP, 2019
2,4-D	340	AEP, 2019	-	-		0.43	0.67	AEP, 2019	3200	AEP, 2019
DDT	340	AEP, 2019	-	-		5900	11,000	AEP, 2019	3200	AEP, 2019
Diazinon	67	AEP, 2019	-	-		2.2	4.2	AEP, 2019	630	AEP, 2019
Dicamba	420	AEP, 2019	-	-		0.5	0.79	AEP, 2019	4000	AEP, 2019
Dichlorfop-methyl	34	AEP, 2019	-	-		NGR	NGR	AEP, 2019	320	AEP, 2019
Dieldrin	5.1	AEP, 2019	-	-		0.59	1.1	AEP, 2019	49	AEP, 2019
Dimethoate	67	AEP, 2019	-	-		0.077	0.12	AEP, 2019	630	AEP, 2019
Dinoseb	34	AEP, 2019	-	-		2.8	5.5	AEP, 2019	320	AEP, 2019
Diquat	270	AEP, 2019	-	-		11	21	AEP, 2019	2500	AEP, 2019
Diuron	520	AEP, 2019	-	-		1.9	3.5	AEP, 2019	4900	AEP, 2019
Endosulfan	320	AEP, 2019	-	-		99	190	AEP, 2019	3000	AEP, 2019
Endrin	15	AEP, 2019	-	-		2.4	4.7	AEP, 2019	150	AEP, 2019
Glyphosate	1000	AEP, 2019	-	-		0.95	1.4	AEP, 2019	9500	AEP, 2019
Heptachlor	0.69	AEP, 2019	2.4	0.094	AEP, 2019	0.039	0.076	AEP, 2019	6.5	AEP, 2019
Lindane	10	AEP, 2019	-	-		0.31	0.6	AEP, 2019	95	AEP, 2019
Linuron	67	AEP, 2019	-	-		0.56	1.1	AEP, 2019	630	AEP, 2019
Malathion	670	AEP, 2019	-	-		0.82	1.3	AEP, 2019	6300	AEP, 2019
MCPA	690	AEP, 2019	-	-		0.42	0.66	AEP, 2019	160	AEP, 2019
Methoxychlor	5300	AEP, 2019	-	-		NGR	NGR	AEP, 2019	50 000	AEP, 2019
Metolachlor	170	AEP, 2019	-	-		1.3	2.4	AEP, 2019	1600	AEP, 2019
Metribuzin	280	AEP, 2019	-	-		7.8	15	AEP, 2019	2600	AEP, 2019
Paraquat	34	AEP, 2019	-	-		1.1	2.2	AEP, 2019	320	AEP, 2019
Parathion	170	AEP, 2019	-	-		7.2	14	AEP, 2019	1600	AEP, 2019
Phorate	6.7	AEP, 2019	-	-		0.075	0.14	AEP, 2019	63	AEP, 2019
Picloram	670	AEP, 2019	-	-		0.64	0.94	AEP, 2019	6300	AEP, 2019
Simazine	44	AEP, 2019	-	-		0.14	0.25	AEP, 2019	410	AEP, 2019
Tebuthiuron	2400	AEP, 2019	-	-		2.5	3.7	AEP, 2019	22 000	AEP, 2019
Terbufos	1.7	AEP, 2019	-	-		0.08	0.15	AEP, 2019	16	AEP, 2019
Toxaphene	7.3	AEP, 2019	36,000	1400	AEP, 2019	3.3	6.3	AEP, 2019	69	AEP, 2019
Triallate	440	AEP, 2019	-	-		16	31	AEP, 2019	4100	AEP, 2019
Trifluralin	160	AEP, 2019	-	-		NGR	NGR	AEP, 2019	1500	AEP, 2019
PFAS Substances										
Perfluorooctanoic acid (PFOA)	1.05 [8]	HC, 2019	-	-		-	-		-	
Perfluorooctane sulfonate (PFOS)	3.2 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1	-	
Perfluorobutanoate (PFBA)	173	HC, 2019	-	-		-	-		-	
Perfluorobutane sulfonate (PFBS)	92	HC, 2019	-	-		-	-		-	
Perfluorohexanesulfonate (PFHxS)	3.5	HC, 2019	-	-		-	-		-	
Perfluoropentanoate (PFPeA)	1.21	HC, 2019	-	-		-	-		-	
Perfluorohexanoate (PFHxA)	1.21	HC, 2019	-	-		-	-		-	
Perfluoroheptanoate (PFHpA)	1.21	HC, 2019	-	-		-	-		-	
Perfluorononanoate (PFNA)	0.13	HC, 2019	-	-		-	-		-	

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Commercial Land Use (mg/kg)

Land Use	Commercial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Other Parameters										
Polychlorinated Biphenyl (Total PCB)	33	AEP, 2019	2300	450	MOECC, 2011[4]	1100	770	MOECC, 2011	310	AEP, 2019
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000004	CCME	0.21	0.043	MOECC, 2011	0.0026	0.0018	MOECC, 2011	0.000004	CCME
Pentachlorophenol (PCP)	340	CCME	240 000	240 000	CCME	7.6	7.6	CCME	3200	AEP, 2019
Organotins - Tributyltin	3.8	USEPA, 2019 [5]	-	-		-	-		-	
Ethylene Glycol	110 000	AEP, 2019	NGR	NGR	AEP, 2019	60	68	AEP, 2019	NGR	AEP, 2019
Propylene Glycol	-		-	-		-	-		-	
Phenol	7000	CCME	1800	1800	CCME	3.8	3.8	CCME	29 000	AEP, 2019

Notes:

[1] All values are in units of mg/kg unless otherwise noted.

[2] "-" indicates no guideline available; >RES means no soil criteria are shown as residual soil saturation limits may be exceeded; IACR means the CCME Index of Additive Cancer Risk for carcinogenic PAHs.

[3] When evaluating human contact with sediments, dry weight chemical concentrations in sediment should be evaluated against the soil quality guidelines for Soil Contact/Ingestion only.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1 x 10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Benzo(a)pyrene (BaP) Total Potency Equivalents (TPE) are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment, 2010 Canadian soil quality guidelines for the protection of environmental and human health: Carcinogenic and Other PAHs."

[7] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[8] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

[9] The guideline is applicable to both 1-methylnaphthalene and 2-methylnaphthalene isomers. If both isomers are detected, the sum of the two must not exceed the guideline.

[10] The BC CSR Schedule 3.1 value is pH-dependent.The lowest value from Schedule 3.1 is presented.

* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Industrial Land Use (mg/kg)

Land Use	Industrial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Inorganic Parameters										
Aluminum	220 000	USEPA, 2019 [5]	-	-		-	-		-	
Antimony	63	MOECC, 2011	-	-		-	-		-	
Arsenic	31	CCME [4]	-	-		10	10	BC CSR Schedule 3.1	39	CCME [4]
Barium	130 000	CCME	-	-		350	350	BC CSR Schedule 3.1	96 000	CCME
Beryllium	1400	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	1100	CCME
Boron (Total)	24 000	MOECC, 2011	-	-		-	-		-	
Boron (mg/L in saturated paste extract)	230 000	AEP, 2019	-	-		65	118	AEP, 2019	110 000	AEP, 2019
Cadmium	2090	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	192	CCME
Chromium (hexavalent)	1300	MOECC, 2011	-	-		60	60	BC CSR Schedule 3.1	-	
Chromium (total)	6700	CCME	-	-		>1 000 000	>1 000 000	BC CSR Schedule 3.1	2300	CCME
Cobalt	250	MOECC, 2011	-	-		25	25	BC CSR Schedule 3.1	-	
Copper	20 000	CCME	-	-		250 [10]	250 [10]	BC CSR Schedule 3.1	16 000	CCME
Cyanide	2300	CCME	-	-		6.5	6.5	BC CSR Schedule 3.1	420	CCME
Iron	164 000	USEPA, 2019 [5]	-	-		-	-		-	
Lead	8200	CCME	-	-		120	120	BC CSR Schedule 3.1	740	CCME
Manganese	5200	USEPA, 2019 [5]	-	-		2000	2000	BC CSR Schedule 3.1	-	
Mercury (total)	690	CCME	-	-		-	-		99	CCME
Molybdenum	1200	MOECC, 2011	-	-		15	15	BC CSR Schedule 3.1	-	
Nickel	5100	CCME	-	-		70 [10]	70 [10]	BC CSR Schedule 3.1	2500	CCME
Selenium	4050	CCME	-	-		1	1	BC CSR Schedule 3.1	1135	CCME
Silver	490	MOECC, 2011	-	-		-	-		-	
Strontium	140 000	USEPA, 2019 [5]	-	-		-	-		-	
Thallium	1	CCME	-	-		-	-		-	
Tin	140 000	USEPA, 2019 [5]	-	-		-	-		-	
Uranium	510	CCME	-	-		30	30	BC CSR Schedule 3.1	300	CCME
Vanadium	160	MOECC, 2011	-	-		100	100	BC CSR Schedule 3.1	-	
Zinc	270 000	CCME	-	-		200 [10]	200 [10]	BC CSR Schedule 3.1	140 000	CCME
General Chemistry Parameters										
Chloride	>1 000 000	BC CSR Schedule 3.1	-	-		100	100	BC CSR Schedule 3.1	-	
Sodium	>1 000 000	BC CSR Schedule 3.1	-	-		15 000	15 000	BC CSR Schedule 3.1	-	
Petroleum Hydrocarbons (PHC) Parameters										
Benzene	980	ARBCA, 2021	6.9	0.52	ARBCA, 2021	0.094	0.042	ARBCA, 2021	1100	AEP, 2019
Toluene	4700	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.74	0.35	ARBCA, 2021	9200	AEP, 2019
Ethylbenzene	11 000	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.089	0.043	ARBCA, 2021	24 000	AEP, 2019
Xylene	6300	ARBCA, 2021	>RES	60	ARBCA, 2021	1.5	0.73	ARBCA, 2021	6900	AEP, 2019
Modified TPH (Gas)	77 000	ARBCA, 2021	>RES	2000	ARBCA, 2021	1900	940	ARBCA, 2021	-	
Modified TPH (Fuel)	47 000	ARBCA, 2021	>RES	32000	ARBCA, 2021	4700	1800	ARBCA, 2021	-	
Modified TPH (Lube)	74 000	ARBCA, 2021	>RES	>RES	ARBCA, 2021	>RES	15 000	ARBCA, 2021	-	
MTBE	6800	AEP, 2019	7.4	0.57	AEP, 2019	0.044	0.062	AEP, 2019	5400	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters										
Non-Carcinogenic PAH Compounds										
Naphthalene	34 000	AEP, 2019	370	25	AEP, 2019	28	53	AEP, 2019	26 000	AEP, 2019
1 - Methylnaphthalene	560	MOECC, 2011 [9]	-	-		42	30	MOECC, 2011 [9]	-	
2 - Methylnaphthalene		MOECC, 2011 [9]	-	-				MOECC, 2011 [9]	-	
Acenaphthene	75 000	AEP, 2019	770 000	43 000	AEP, 2019	NGR	NGR	AEP, 2019	75 000	AEP, 2019
Acenaphthylene	96	MOECC, 2011 [4]	390	66	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]	-	
Anthracene	300 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	350 000	AEP, 2019
Fluoranthene	50 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	50 000	AEP, 2019

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Industrial Land Use (mg/kg)

Land Use	Industrial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Fluorene	46 000	AEP, 2019	NGR	91,000	AEP, 2019	NGR	NGR	AEP, 2019	39 000	AEP, 2019
Phenanthrene	-		-	-		24	17	MOECC, 2011	-	
Pyrene	34 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	30 000	AEP, 2019
Carcinogenic PAH Compounds										
BaP Total Potency Equivalents	5.3	CCME	NGR	NGR	AEP, 2019	IACR<1.0	IACR<1.0	CCME	75	AEP, 2019
Benz[a]anthracene	-		-	-		6.4	12	AEP, 2019	-	
Benzo[a]pyrene	-		-	-		7.0	14	AEP, 2019	-	
Benzo[b,j,k]fluoranthene isomers	-		-	-		0.64	1.2	AEP, 2019	-	
Benzo[g,h,i]perylene	-		-	-		130	250	AEP, 2019	-	
Chrysene	-		-	-		40	78	AEP, 2019	-	
Dibenz[a,h]anthracene	-		-	-		4.4	8.8	AEP, 2019	-	
Indeno[1,2,3-c,d]pyrene	-		-	-		51	98	AEP, 2019	-	
Volatile Organic Compound (VOC) Parameters										
Bromodichloromethane	180	MOECC, 2011 [4]	-	-		1.9	1.5	MOECC, 2011	-	
Bromoform	1400	MOECC, 2011 [4]	17	6.1	MOECC, 2011 [4]	2.9	2.3	MOECC, 2011	-	
Bromomethane*	300	BC CSR Schedule 3.1	0.012	0.0016	MOECC, 2011	0.1	0.097	MOECC, 2011	-	
Carbon Tetrachloride (Tetrachloromethane)*	480	AEP, 2019	0.092	0.0069	AEP, 2019	0.037	0.062	AEP, 2019	380	AEP, 2019
Chlorobenzene	300 000	AEP, 2019	2.7	0.22	AEP, 2019	0.61	1.1	AEP, 2019	230 000	AEP, 2019
Chloroethane	-		-	-		-	-		-	
Chloroform	1800	AEP, 2019	1.5	0.14	AEP, 2019	0.53	0.88	AEP, 2019	1000	AEP, 2019
Chloromethane	-		-	-		-	-		-	
Dibromochloromethane	14 000	AEP, 2019	76	2.5	AEP, 2019	0.91	1.5	AEP, 2019	11 000	AEP, 2019
1,2-Dichlorobenzene	300 000	AEP, 2019	1700	130	AEP, 2019	0.097	0.18	AEP, 2019	230 000	AEP, 2019
1,3-Dichlorobenzene	4400	MOECC, 2011	-	-		34	24	MOECC, 2011	-	
1,4-Dichlorobenzene	74 000	AEP, 2019	100	8	AEP, 2019	0.051	0.098	AEP, 2019	59 000	AEP, 2019
1,1-Dichloroethane	>1 000 000	BC CSR Schedule 3.1	39	56	MOECC, 2011	0.6	0.47	MOECC, 2011	-	
1,2-Dichloroethane	4200	AEP, 2019	0.37	0.033	AEP, 2019	0.025	0.041	AEP, 2019	40 000	AEP, 2019
1,1-Dichloroethylene	590	ARBCA, 2021	6.6	0.49	ARBCA, 2021	0.38	0.17	ARBCA, 2021	27 000	AEP, 2019
cis-1,2-Dichloroethylene	390	ARBCA, 2021	3.8	0.24	ARBCA, 2021	1.0	0.42	ARBCA, 2021	-	
trans-1,2-Dichloroethylene	3900	ARBCA, 2021	4.1	0.25	ARBCA, 2021	1.4	0.58	ARBCA, 2021	-	
1,2-Dichloropropane	10 000	BC CSR Schedule 3.1	0.68	0.16	MOECC, 2011	0.74	0.54	MOECC, 2011	-	
1,3-Dichloropropene	200 000	BC CSR Schedule 3.1	2.1	1.8	MOECC, 2011 [4]	0.81	0.59	MOECC, 2011 [4]	-	
Ethylene Dibromide*	3.1	MOECC, 2011 [4]	0.019	0.015	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011	-	
Methylene Chloride (Dichloromethane)	7300	AEP, 2019	110	9	AEP, 2019	0.21	0.32	AEP, 2019	14 000	AEP, 2019
Styrene	26 000	MOECC, 2011	170	42	MOECC, 2011	66	47	MOECC, 2011	-	
1,1,1,2-Tetrachloroethane	1500	BC CSR Schedule 3.1	1.1	0.87	MOECC, 2011 [4]	0.2	0.15	MOECC, 2011	-	
1,1,2,2-Tetrachloroethane	150	BC CSR Schedule 3.1	0.94	0.19	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011	-	
Tetrachloroethylene	920	ARBCA, 2021	2.9	0.2	ARBCA, 2021	0.57	0.27	ARBCA, 2021	2.1	CCME
1,1,1-Trichloroethane	>1 000 000	BC CSR Schedule 3.1	42	6.1	MOECC, 2011	27	20	MOECC, 2011	-	
1,1,2-Trichloroethane	30 000	BC CSR Schedule 3.1	1.1	0.42	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011	-	
Trichloroethylene*	280	ARBCA, 2021	0.14	0.01	ARBCA, 2021	0.13	0.061	ARBCA, 2021	500	AEP, 2019
Vinyl Chloride	340	ARBCA, 2021	0.24	0.016	ARBCA, 2021	0.060	0.021	ARBCA, 2021	1000	AEP, 2019
Pesticides										
Aldicarb	160	AEP, 2019	-	-		0.041	0.065	AEP, 2019	320	AEP, 2019
Aldrin	44	AEP, 2019	-	-		5.9	11	AEP, 2019	49	AEP, 2019
Atrazine	80	AEP, 2019	-	-		0.10	0.19	AEP, 2019	160	AEP, 2019
Azinphos-methyl	400	AEP, 2019	-	-		0.41	0.75	AEP, 2019	790	AEP, 2019
Bendiocarb	640	AEP, 2019	-	-		0.14	0.21	AEP, 2019	1300	AEP, 2019
Bromoxynil	80	AEP, 2019	-	-		0.18	0.35	AEP, 2019	160	AEP, 2019

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Industrial Land Use (mg/kg)

Land Use	Industrial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Carbaryl	1600	AEP, 2019	-	-		1.9	3.6	AEP, 2019	3200	AEP, 2019
Carbofuran	1600	AEP, 2019	-	-		0.68	1.2	AEP, 2019	3200	AEP, 2019
Chlorothalonil	2400	AEP, 2019	-	-		27	53	AEP, 2019	4800	AEP, 2019
Chlorpyrifos	1600	AEP, 2019	-	-		49	95	AEP, 2019	3200	AEP, 2019
Cyanazine	210	AEP, 2019	-	-		0.12	0.21	AEP, 2019	410	AEP, 2019
2,4-D	1600	AEP, 2019	-	-		0.43	0.67	AEP, 2019	3200	AEP, 2019
DDT	1600	AEP, 2019	-	-		5900	11,000	AEP, 2019	3200	AEP, 2019
Diazinon	320	AEP, 2019	-	-		2.2	4.2	AEP, 2019	630	AEP, 2019
Dicamba	2000	AEP, 2019	-	-		0.5	0.79	AEP, 2019	4000	AEP, 2019
Dichlorfop-methyl	160	AEP, 2019	-	-		NGR	NGR	AEP, 2019	320	AEP, 2019
Dieldrin	44	AEP, 2019	-	-		0.59	1.1	AEP, 2019	49	AEP, 2019
Dimethoate	320	AEP, 2019	-	-		0.077	0.12	AEP, 2019	630	AEP, 2019
Dinoseb	160	AEP, 2019	-	-		2.8	5.5	AEP, 2019	320	AEP, 2019
Diquat	1300	AEP, 2019	-	-		11	21	AEP, 2019	2500	AEP, 2019
Diuron	2500	AEP, 2019	-	-		1.9	3.5	AEP, 2019	4900	AEP, 2019
Endosulfan	3000	AEP, 2019	-	-		99	190	AEP, 2019	3000	AEP, 2019
Endrin	130	AEP, 2019	-	-		2.4	4.7	AEP, 2019	150	AEP, 2019
Glyphosate	4800	AEP, 2019	-	-		0.95	1.4	AEP, 2019	9500	AEP, 2019
Heptachlor	2.8	AEP, 2019	2.4	0.094	AEP, 2019	0.039	0.076	AEP, 2019	6.5	AEP, 2019
Lindane	48	AEP, 2019	-	-		0.31	0.6	AEP, 2019	95	AEP, 2019
Linuron	320	AEP, 2019	-	-		0.56	1.1	AEP, 2019	630	AEP, 2019
Malathion	3200	AEP, 2019	-	-		0.82	1.3	AEP, 2019	6300	AEP, 2019
MCPA	8200	AEP, 2019	-	-		0.42	0.66	AEP, 2019	160	AEP, 2019
Methoxychlor	50 000	AEP, 2019	-	-		NGR	NGR	AEP, 2019	50 000	AEP, 2019
Metolachlor	800	AEP, 2019	-	-		1.3	2.4	AEP, 2019	1600	AEP, 2019
Metribuzin	1300	AEP, 2019	-	-		7.8	15	AEP, 2019	2600	AEP, 2019
Paraquat	160	AEP, 2019	-	-		1.1	2.2	AEP, 2019	320	AEP, 2019
Parathion	800	AEP, 2019	-	-		7.2	14	AEP, 2019	1600	AEP, 2019
Phorate	32	AEP, 2019	-	-		0.075	0.14	AEP, 2019	63	AEP, 2019
Picloram	3200	AEP, 2019	-	-		0.64	0.94	AEP, 2019	6300	AEP, 2019
Simazine	210	AEP, 2019	-	-		0.14	0.25	AEP, 2019	410	AEP, 2019
Tebuthiuron	11 000	AEP, 2019	-	-		2.5	3.7	AEP, 2019	22 000	AEP, 2019
Terbufos	8	AEP, 2019	-	-		0.08	0.15	AEP, 2019	16	AEP, 2019
Toxaphene	7.3	AEP, 2019	36,000	1400	AEP, 2019	3.3	6.3	AEP, 2019	69	AEP, 2019
Triallate	2100	AEP, 2019	-	-		16	31	AEP, 2019	4100	AEP, 2019
Trifluralin	770	AEP, 2019	-	-		NGR	NGR	AEP, 2019	1500	AEP, 2019
PFAS Substances										
Perfluorooactanoic acid (PFOA)	9.94 [8]	HC, 2019	-	-		-	-		-	
Perfluorooctane sulfonate (PFOS)	30.5 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1	-	
Perfluorobutanoate (PFBA)	1630	HC, 2019	-	-		-	-		-	
Perfluorobutane sulfonate (PFBS)	872	HC, 2019	-	-		-	-		-	
Perfluorohexanesulfonate (PFHxS)	33	HC, 2019	-	-		-	-		-	
Perfluoropentanoate (PFPeA)	11.41	HC, 2019	-	-		-	-		-	
Perfluorohexanoate (PFHxA)	11.41	HC, 2019	-	-		-	-		-	
Perfluoroheptanoate (PFHpA)	11.41	HC, 2019	-	-		-	-		-	
Perfluorononanoate (PFNA)	1.2	HC, 2019	-	-		-	-		-	
Other Parameters										
Polychlorinated Biphenyl (Total PCB)	160	AEP, 2019	2300	450	MOECC, 2011 [4]	1100	770	MOECC, 2011	310	AEP, 2019
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000175	CCME	0.21	0.043	MOECC, 2011	0.0026	0.0018	MOECC, 2011	0.000004	CCME
Pentachlorophenol (PCP)	7500	CCME	280 000	280 000	CCME	7.6	7.6	CCME	1300	CCME

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Industrial Land Use (mg/kg)

Land Use	Industrial									
Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse	Reference
Organotins - Tributyltin	50	USEPA, 2019 [5]	-	-		-	-		-	
Ethylene Glycol	530 000	AEP, 2019	NGR	NGR	AEP, 2019	60	68	AEP, 2019	NGR	AEP, 2019
Propylene Glycol	-		-	-		-	-		-	
Phenol	150 000	CCME	2100	2100	CCME	3.8	3.8	CCME	28 000	CCME

Notes:

[1] All values are in units of mg/kg unless otherwise noted.

[2] "-" indicates no guideline available; >RES means no soil criteria are shown as residual soil saturation limits may be exceeded; IACR means the CCME Index of Additive Cancer Risk for carcinogenic PAHs.

[3] When evaluating human contact with sediments, dry weight chemical concentrations in sediment should be evaluated against the soil quality guidelines for Soil Contact/Ingestion only.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1 x 10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Benzo(a)pyrene (BaP) Total Potency Equivalents (TPE) are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment, 2010 Canadian soil quality guidelines for the protection of environmental and human health: Carcinogenic and Other PAHs."

[7] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[8] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

[9] The guideline is applicable to both 1-methylnaphthalene and 2-methylnaphthalene isomers. If both isomers are detected, the sum of the two must not exceed the guideline.

[10] The BC CSR Schedule 3.1 value is pH-dependent.The lowest value from Schedule 3.1 is presented.

* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: www.atlanticrbca.com/technical-documents/.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Groundwater - Agricultural Land Use (µg/L)

Land Use	Agricultural				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Inorganic Parameters					
Aluminum	100	HC, 2019 (OG)	-	-	
Antimony	6	HC, 2019	-	-	
Arsenic	10	HC, 2019 (ALARA)	-	-	
Barium	1000	HC, 2019	-	-	
Beryllium	4	MOECC, 2011	-	-	
Boron	5000	HC, 2019	-	-	
Cadmium	5	HC, 2019	-	-	
Chromium (hexavalent)	50	HC, 2019	-	-	
Chromium (total)	50	HC, 2019	-	-	
Cobalt	3.8	MOECC, 2011	-	-	
Copper	2000	HC, 2019 (MAC)	-	-	
Cyanide	200	HC, 2019	-	-	
Iron	300	HC, 2019 (AO)	-	-	
Lead	5	HC, 2019 (ALARA)	-	-	
Manganese	120	HC, 2019	-	-	
Mercury (total)	1	HC, 2019	-	-	
Molybdenum	70	MOECC, 2011	-	-	
Nickel	100	MOECC, 2011	-	-	
Selenium	50	HC, 2019	-	-	
Silver	Not required	HC, 2019	-	-	
Strontium	2400	USEPA, 2019 [5]	-	-	
Thallium	2	MOECC, 2011	-	-	
Tin	2400	USEPA, 2019 [5]	-	-	
Uranium	20	HC, 2019	-	-	
Vanadium	6.2	MOECC, 2011	-	-	
Zinc	5000	HC, 2019 (AO)	-	-	
General Chemistry Parameters					
Chloride	250 000	HC, 2019 (AO)	-	-	
Sodium	200 000	HC, 2019 (AO)	-	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	5	ARBCA, 2021	2700	530	ARBCA, 2021
Toluene	24	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Ethylbenzene	1.6	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Xylene	20	ARBCA, 2021	>Sol	38 000	ARBCA, 2021
Modified TPH (Gas)	4400	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Modified TPH (Fuel)	3200	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Modified TPH (Lube)	7800	ARBCA, 2021	> Sol	>Sol	ARBCA, 2021
MTBE	15	HC, 2019 (AO)	6100	340	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	470	AEP, 2019	NGR	7000	AEP, 2019
1 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
2 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
Acenaphthene	1400	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene	4.5	MOECC, 2011 [4]	1200	360	MOECC, 2011 [4]
Anthracene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene	940	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene	-	AEP, 2019	-	-	AEP, 2019
Pyrene	710	AEP, 2019	NGR	NGR	AEP, 2019
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	0.04	HC, 2019	-	-	
Benz[a]anthracene	-		-	-	
Benzo[a]pyrene	0.04	HC, 2019	-	-	
Benzo[b,j,k]fluoranthene isomers	-		-	-	
Benzo[g,h,i]perylene	-		-	-	
Chrysene	-		-	-	
Dibenz[a,h]anthracene	-		-	-	
Indeno[1,2,3-c,d]pyrene	-		-	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	100	HC, 2019	-	-	
Bromoform	100	HC, 2019	7700	3800	MOECC, 2011 [4]
Bromomethane	51	BC CSR Schedule 3.2	56	5.6	MOECC, 2011

Land Use	Agricultural				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Carbon Tetrachloride (Tetrachloromethane)	2	HC, 2019	12	0.57	AEP, 2019
Chlorobenzene	80	HC, 2019	300	14	AEP, 2019
Chloroethane	-		-	-	
Chloroform	80	AEP, 2019	530	30	AEP, 2019
Chloromethane	38	USEPA, 2019 [5]	-	-	
Dibromochloromethane	190	AEP, 2019	26 000	1100	AEP, 2019
1,2-Dichlorobenzene	200	HC, 2019	116 000	5400	AEP, 2019
1,3-Dichlorobenzene	59	MOECC, 2011	-	-	
1,4-Dichlorobenzene	5	HC, 2019	4600	220	AEP, 2019
1,1-Dichloroethane	3700	BC CSR Schedule 3.2	3100	320	MOECC, 2011
1,2-Dichloroethane	5	HC, 2019	170	10	AEP, 2019
1,1-Dichloroethylene	14	ARBCA, 2021	4600	950	ARBCA, 2021
cis-1,2-Dichloroethylene	70	ARBCA, 2021	3900	770	ARBCA, 2021
trans-1,2-Dichloroethylene	100	ARBCA, 2021	4100	820	ARBCA, 2021
1,2-Dichloropropane	9.9	BC CSR Schedule 3.2	140	16	MOECC, 2011
1,3-Dichloropropene	6.7	BC CSR Schedule 3.2	45	5.2	MOECC, 2011
Ethylene Dibromide	0.34	BC CSR Schedule 3.2	8.3	2.5	MOECC, 2011 [4]
Methylene Chloride (Dichloromethane)	50	HC, 2019	61 000	3400	AEP, 2019
Styrene	100	MOECC, 2011	11 000	1300	MOECC, 2011
1,1,1,2- Tetrachloroethane	26	BC CSR Schedule 3.2	280	33	MOECC, 2011 [4]
1,1,2,2-Tetrachloroethane	3.4	BC CSR Schedule 3.2	150	32	MOECC, 2011 [4]
Tetrachloroethylene	10	ARBCA, 2021	1000	210	ARBCA, 2021
1,1,1-Trichloroethane	10 000	BC CSR Schedule 3.2	6700	640	MOECC, 2011
1,1,2-Trichloroethane	12	BC CSR Schedule 3.2	300	47	MOECC, 2011 [4]
Trichloroethylene	5	ARBCA, 2021	92	19	ARBCA, 2021
Vinyl Chloride	2	ARBCA, 2021	41	8.6	ARBCA, 2021
Pesticides					
Aldicarb	-		-	-	
Aldrin	-		-	-	
Atrazine	5	HC, 2019	-	-	
Azinphos-methyl	20	HC, 2019	-	-	
Bendiocarb	40	AEP, 2019	-	-	
Bromoxynil	5	HC, 2019	-	-	
Carbaryl	90	HC, 2019	-	-	
Carbofuran	90	HC, 2019	-	-	
Chlorothalonil	140	AEP, 2019	-	-	
Chlorpyrifos	90	HC, 2019	-	-	
Cyanazine	10	AEP, 2019	-	-	
2,4-D	100	HC, 2019	-	-	
DDT	93	AEP, 2019	-	-	
Diazinon	20	HC, 2019	-	-	
Dicamba	120	HC, 2019	-	-	
Dichlorfop-methyl	-		-	-	
Dieldrin	-		-	-	
Dimethoate	20	HC, 2019	-	-	
Dinoseb	-		-	-	
Diquat	70	HC, 2019	-	-	
Diuron	150	HC, 2019	-	-	
Endosulfan	57	AEP, 2019	-	-	
Endrin	2.8	AEP, 2019	-	-	
Glyphosate	280	HC, 2019	-	-	
Heptachlor	0.052	AEP, 2019	4.3	0.24	AEP, 2019
Lindane	2.8	AEP, 2019	-	-	
Linuron	19	AEP, 2019	-	-	
Malathion	190	HC, 2019	-	-	
MCPA	100	HC, 2019	-	-	
Methoxychlor	-		-	-	
Metolachlor	50	HC, 2019	-	-	
Metribuzin	80	HC, 2019	-	-	
Paraquat	10	HC, 2019	-	-	
Parathion	-		-	-	
Phorate	2	HC, 2019	-	-	
Picloram	190	HC, 2019	-	-	
Simazine	10	HC, 2019	-	-	

Land Use	Agricultural				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Tebuthiuron	660	AEP, 2019	-	-	
Terbufos	1	HC, 2019	-	-	
Toxaphene	0.43	AEP, 2019	6400	310	AEP, 2019
Triallate	120	AEP, 2019	-	-	
Trifluralin	45	HC, 2019	-	-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	0.2 [7]	HC, 2019	-	-	
Perfluorooctane sulfonate (PFOS)	0.6 [7]	HC, 2019	-	-	
Perfluorobutanoate (PFBA)	30	HC, 2019	-	-	
Perfluorobutane sulfonate (PFBS)	15	HC, 2019	-	-	
Perfluorohexanesulfonate (PFHxS)	0.6	HC, 2019	-	-	
Perfluoropentanoate (PFPeA)	0.2	HC, 2019	-	-	
Perfluorohexanoate (PFHxA)	0.2	HC, 2019	-	-	
Perfluoroheptanoate (PFHpA)	0.2	HC, 2019	-	-	
Perfluorononanoate (PFNA)	0.02	HC, 2019	-	-	
Other Parameters					
Polychlorinated Biphenyl (Total PCB)	9.4	AEP, 2019	150	78	MOECC, 2011 [4]
Dioxins and Furans (TEQ) [6]	0.00012	AEP, 2019	0.023	0.014	MOECC, 2011
Pentachlorophenol (PCP)	60	HC, 2019	-	-	
Organotins - Tributyltin	0.74	USEPA, 2019 [5]	-	-	
Ethylene Glycol	31 000	AEP, 2019	NGR	NGR	AEP, 2019
Propylene Glycol	-		-	-	
Phenol	570	AEP, 2019	73 000 000	3 700 000	AEP, 2019

Notes:

[1] All values in µg/L unless otherwise noted.

[2] "-" indicates no guideline available; ">SOL" means no criteria are shown as theoretical aqueous solubilities may be exceeded; "NGR" indicates no guideline required.

[3] Health Canada MAC (Maximum Acceptable Concentration), IMAC (Interim MAC), AO (Aesthetic Objectives), OG (Operational Guidance) and ALARA (As Low As Reasonably Achievable) criteria are shown for the Potable Groundwater Drinking Water pathway, where applicable. However, Health Canada AO and OG values are not considered as potential Tier I EQS values for this pathway.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1×10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[7] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

Land Use	Residential / Parkland				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Inorganic Parameters					
Aluminum	100	HC, 2019 (OG)	-	-	
Antimony	6	HC, 2019	-	-	
Arsenic	10	HC, 2019 (ALARA)	-	-	
Barium	1000	HC, 2019	-	-	
Beryllium	4	MOECC, 2011	-	-	
Boron	5000	HC, 2019	-	-	
Cadmium	5	HC, 2019	-	-	
Chromium (hexavalent)	50	HC, 2019	-	-	
Chromium (total)	50	HC, 2019	-	-	
Cobalt	3.8	MOECC, 2011	-	-	
Copper	2000	HC, 2019 (MAC)	-	-	
Cyanide	200	HC, 2019	-	-	
Iron	300	HC, 2019 (AO)	-	-	
Lead	5	HC, 2019 (ALARA)	-	-	
Manganese	120	HC, 2019	-	-	
Mercury (total)	1	HC, 2019	-	-	
Molybdenum	70	MOECC, 2011	-	-	
Nickel	100	MOECC, 2011	-	-	
Selenium	50	HC, 2019	-	-	
Silver	Not required	HC, 2019	-	-	
Strontium	2400	USEPA, 2019 [5]	-	-	
Thallium	2	MOECC, 2011	-	-	
Tin	2400	USEPA, 2019 [5]	-	-	
Uranium	20	HC, 2019	-	-	
Vanadium	6.2	MOECC, 2011	-	-	
Zinc	5000	HC, 2019 (AO)	-	-	
General Chemistry Parameters					
Chloride	250 000	HC, 2019 (AO)	-	-	
Sodium	200 000	HC, 2019 (AO)	-	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	5	ARBCA, 2021	2 700	530	ARBCA, 2021
Toluene	24	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Ethylbenzene	1.6	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Xylene	20	ARBCA, 2021	>Sol	38 000	ARBCA, 2021
Modified TPH (Gas)	4400	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Modified TPH (Fuel)	3200	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Modified TPH (Lube)	7800	ARBCA, 2021	> Sol	>Sol	ARBCA, 2021
MTBE	15	HC, 2019 (AO)	6100	340	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	470	AEP, 2019	NGR	7000	AEP, 2019
1 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
2 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
Acenapthene	1400	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene	4.5	MOECC, 2011 [4]	1200	360	MOECC, 2011 [4]
Anthracene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene	940	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene	-	AEP, 2019	-	-	AEP, 2019
Pyrene	710	AEP, 2019	NGR	NGR	AEP, 2019
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	0.04	HC, 2019	-	-	
Benz[a]anthracene	-		-	-	
Benzo[a]pyrene	0.04	HC, 2019	-	-	
Benzo[b,j,k]fluoranthene isomers	-		-	-	
Benzo[g,h,i]perylene	-		-	-	
Chrysene	-		-	-	
Dibenz[a,h]anthracene	-		-	-	

Land Use	Residential / Parkland				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Indeno[1,2,3-c,d]pyrene	-		-	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	100	HC, 2019	-	-	
Bromoform	100	HC, 2019	7700	3800	MOECC, 2011 [4]
Bromomethane	51	BC CSR Schedule 3.2	56	5.6	MOECC, 2011
Carbon Tetrachloride (Tetrachloromethane)	2	HC, 2019	12	0.57	AEP, 2019
Chlorobenzene	80	HC, 2019	300	14	AEP, 2019
Chloroethane	-		-	-	
Chloroform	80	AEP, 2019	530	30	AEP, 2019
Chloromethane	38	USEPA, 2019 [5]	-	-	
Dibromochloromethane	190	AEP, 2019	26 000	1100	AEP, 2019
1,2-Dichlorobenzene	200	HC, 2019	116 000	5400	AEP, 2019
1,3-Dichlorobenzene	59	MOECC, 2011	-	-	
1,4-Dichlorobenzene	5	HC, 2019	4600	220	AEP, 2019
1,1-Dichloroethane	3700	BC CSR Schedule 3.2	3100	320	MOECC, 2011
1,2-Dichloroethane	5	HC, 2019	170	10	AEP, 2019
1,1-Dichloroethylene	14	ARBCA, 2021	4600	950	ARBCA, 2021
cis-1,2-Dichloroethylene	70	ARBCA, 2021	3900	770	ARBCA, 2021
trans-1,2-Dichloroethylene	100	ARBCA, 2021	4100	820	ARBCA, 2021
1,2-Dichloropropane	9.9	BC CSR Schedule 3.2	140	16	MOECC, 2011
1,3-Dichloropropene	6.7	BC CSR Schedule 3.2	45	5.2	MOECC, 2011
Ethylene Dibromide	0.34	BC CSR Schedule 3.2	8.3	2.5	MOECC, 2011 [4]
Methylene Chloride (Dichloromethane)	50	HC, 2019	61 000	3400	AEP, 2019
Styrene	100	MOECC, 2011	11 000	1300	MOECC, 2011
1,1,1,2- Tetrachloroethane	26	BC CSR Schedule 3.2	280	33	MOECC, 2011 [4]
1,1,2,2-Tetrachloroethane	3.4	BC CSR Schedule 3.2	150	32	MOECC, 2011 [4]
Tetrachloroethylene	10	ARBCA, 2021	1000	210	ARBCA, 2021
1,1,1-Trichloroethane	10 000	BC CSR Schedule 3.2	6700	640	MOECC, 2011
1,1,2-Trichloroethane	12	BC CSR Schedule 3.2	300	47	MOECC, 2011 [4]
Trichloroethylene	5	ARBCA, 2021	92	19	ARBCA, 2021
Vinyl Chloride	2	ARBCA, 2021	41	8.6	ARBCA, 2021
Pesticides					
Aldicarb	-		-	-	
Aldrin	-		-	-	
Atrazine	5	HC, 2019	-	-	
Azinphos-methyl	20	HC, 2019	-	-	
Bendiocarb	40	AEP, 2019	-	-	
Bromoxynil	5	HC, 2019	-	-	
Carbaryl	90	HC, 2019	-	-	
Carbofuran	90	HC, 2019	-	-	
Chlorothalonil	140	AEP, 2019	-	-	
Chlorpyrifos	90	HC, 2019	-	-	
Cyanazine	10	AEP, 2019	-	-	
2,4-D	100	HC, 2019	-	-	
DDT	93	AEP, 2019	-	-	
Diazinon	20	HC, 2019	-	-	
Dicamba	120	HC, 2019	-	-	
Dichlorfop-methyl	-		-	-	
Dieldrin	-		-	-	
Dimethoate	20	HC, 2019	-	-	
Dinoseb	-		-	-	
Diquat	70	HC, 2019	-	-	
Diuron	150	HC, 2019	-	-	
Endosulfan	57	AEP, 2019	-	-	
Endrin	2.8	AEP, 2019	-	-	
Glyphosate	280	HC, 2019	-	-	
Heptachlor	0.052	AEP, 2019	4.3	0.24	AEP, 2019
Lindane	2.8	AEP, 2019	-	-	
Linuron	19	AEP, 2019	-	-	

Land Use	Residential / Parkland				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Malathion	190	HC, 2019	-	-	
MCPA	100	HC, 2019	-	-	
Methoxychlor	-		-	-	
Metolachlor	50	HC, 2019	-	-	
Metribuzin	80	HC, 2019	-	-	
Paraquat	10	HC, 2019	-	-	
Parathion	-		-	-	
Phorate	2	HC, 2019	-	-	
Picloram	190	HC, 2019	-	-	
Simazine	10	HC, 2019	-	-	
Tebuthiuron	660	AEP, 2019	-	-	
Terbufos	1	HC, 2019	-	-	
Toxaphene	0.43	AEP, 2019	6400	310	AEP, 2019
Triallate	120	AEP, 2019	-	-	
Trifluralin	45	HC, 2019	-	-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	0.2 [7]	HC, 2019	-	-	
Perfluorooctane sulfonate (PFOS)	0.6 [7]	HC, 2019	-	-	
Perfluorobutanoate (PFBA)	30	HC, 2019	-	-	
Perfluorobutane sulfonate (PFBS)	15	HC, 2019	-	-	
Perfluorohexanesulfonate (PFHxS)	0.6	HC, 2019	-	-	
Perfluoropentanoate (PFPeA)	0.2	HC, 2019	-	-	
Perfluorohexanoate (PFHxA)	0.2	HC, 2019	-	-	
Perfluoroheptanoate (PFHpA)	0.2	HC, 2019	-	-	
Perfluorononanoate (PFNA)	0.02	HC, 2019	-	-	
Other Parameters					
Polychlorinated Biphenyl (Total PCB)	9.4	AEP, 2019	150	78	MOECC, 2011 [4]
Dioxins and Furans (TEQ) [6]	0.00012	AEP, 2019	0.023	0.014	MOECC, 2011
Pentachlorophenol (PCP)	60	HC, 2019	-	-	
Organotins - Tributyltin	0.74	USEPA, 2019 [5]	-	-	
Ethylene Glycol	31 000	AEP, 2019	NGR	NGR	AEP, 2019
Propylene Glycol	-		-	-	
Phenol	570	AEP, 2019	73 000 000	3 700 000	AEP, 2019

Notes:

[1] All values in µg/L unless otherwise noted.

[2] "-" indicates no guideline available; ">SOL" means no criteria are shown as theoretical aqueous solubilities may be exceeded; "NGR" indicates no guideline required.

[3] Health Canada MAC (Maximum Acceptable Concentration), IMAC (Interim MAC), AO (Aesthetic Objectives), OG (Operational Guidance) and ALARA (As Low As Reasonably Achievable) criteria are shown for the Potable Groundwater Drinking Water pathway, where applicable. However, Health Canada AO and OG values are not considered as potential Tier I EQS values for this pathway.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1×10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[7] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Groundwater - Commercial Land Use (µg/L)

Land Use	Commercial				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Inorganic Parameters					
Aluminum	100	HC, 2019 (OG)	-	-	
Antimony	6	HC, 2019	-	-	
Arsenic	10	HC, 2019 (ALARA)	-	-	
Barium	1000	HC, 2019	-	-	
Beryllium	4	MOECC, 2011	-	-	
Boron	5000	HC, 2019	-	-	
Cadmium	5	HC, 2019	-	-	
Chromium (hexavalent)	50	HC, 2019	-	-	
Chromium (total)	50	HC, 2019	-	-	
Cobalt	3.8	MOECC, 2011	-	-	
Copper	2000	HC, 2019 (MAC)	-	-	
Cyanide	200	HC, 2019	-	-	
Iron	300	HC, 2019 (AO)	-	-	
Lead	5	HC, 2019 (ALARA)	-	-	
Manganese	120	HC, 2019	-	-	
Mercury (total)	1	HC, 2019	-	-	
Molybdenum	70	MOECC, 2011	-	-	
Nickel	100	MOECC, 2011	-	-	
Selenium	50	HC, 2019	-	-	
Silver	Not required	HC, 2019	-	-	
Strontium	2400	USEPA, 2019 [5]	-	-	
Thallium	2	MOECC, 2011	-	-	
Tin	2400	USEPA, 2019 [5]	-	-	
Uranium	20	HC, 2019	-	-	
Vanadium	6.2	MOECC, 2011	-	-	
Zinc	5000	HC, 2019 (AO)	-	-	
General Chemistry Parameters					
Chloride	250 000	HC, 2019 (AO)	-	-	
Sodium	200 000	HC, 2019 (AO)	-	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	5	ARBCA, 2021	32 000	6300	ARBCA, 2021
Toluene	24	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Ethylbenzene	1.6	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Xylene	20	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Modified TPH (Gas)	4400	ARBCA, 2021	> Sol	>Sol	ARBCA, 2021
Modified TPH (Fuel)	3200	ARBCA, 2021	> Sol	>Sol	ARBCA, 2021
Modified TPH (Lube)	7800	ARBCA, 2021	> Sol	> Sol	ARBCA, 2021
MTBE	15	HC, 2019 (AO)	40,000	4300	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	470	AEP, 2019	NGR	7000	AEP, 2019
1 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
2 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
Acenaphthene	1400	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene	4.5	MOECC, 2011 [4]	17 000	7500	MOECC, 2011 [4]
Anthracene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene	940	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene	-	AEP, 2019	-	-	AEP, 2019
Pyrene	710	AEP, 2019	NGR	NGR	AEP, 2019
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	0.04	HC, 2019	-	-	
Benz[a]anthracene	-		-	-	
Benzo[a]pyrene	0.04	HC, 2019	-	-	
Benzo[b,j,k]fluoranthene isomers	-		-	-	
Benzo[g,h,i]perylene	-		-	-	
Chrysene	-		-	-	
Dibenz[a,h]anthracene	-		-	-	
Indeno[1,2,3-c,d]pyrene	-		-	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	100	HC, 2019	-	-	
Bromoform	100	HC, 2019	130 000	84 000	MOECC, 2011 [4]
Bromomethane	51	BC CSR Schedule 3.2	230	33	MOECC, 2011
Carbon Tetrachloride (Tetrachloromethane)	2	HC, 2019	80	6.9	AEP, 2019
Chlorobenzene	80	HC, 2019	2200	180	AEP, 2019

Land Use	Commercial				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Chloroethane	-		-	-	
Chloroform	80	AEP, 2019	3500	380	AEP, 2019
Chloromethane	38	USEPA, 2019 [5]	-	-	
Dibromochloromethane	190	AEP, 2019	250 000	10 000	AEP, 2019
1,2-Dichlorobenzene	200	HC, 2019	NGR	64 000	AEP, 2019
1,3-Dichlorobenzene	59	MOECC, 2011	-	-	
1,4-Dichlorobenzene	5	HC, 2019	32 000	2600	AEP, 2019
1,1-Dichloroethane	3700	BC CSR Schedule 3.2	44 000	6600	MOECC, 2011
1,2-Dichloroethane	5	HC, 2019	1200	130	AEP, 2019
1,1-Dichloroethylene	14	ARBCA, 2021	27 000	5600	ARBCA, 2021
cis-1,2-Dichloroethylene	70	ARBCA, 2021	23 000	4600	ARBCA, 2021
trans-1,2-Dichloroethylene	100	ARBCA, 2021	25 000	4900	ARBCA, 2021
1,2-Dichloropropane	9.9	BC CSR Schedule 3.2	2000	330	MOECC, 2011
1,3-Dichloropropene	6.7	BC CSR Schedule 3.2	610	100	MOECC, 2011
Ethylene Dibromide	0.34	BC CSR Schedule 3.2	120	51	MOECC, 2011 [4]
Methylene Chloride (Dichloromethane)	50	HC, 2019	410 000	43 000	AEP, 2019
Styrene	100	MOECC, 2011	160 000	26 000	MOECC, 2011
1,1,1,2- Tetrachloroethane	26	BC CSR Schedule 3.2	3800	660	MOECC, 2011 [4]
1,1,2,2-Tetrachloroethane	3.4	BC CSR Schedule 3.2	2100	630	MOECC, 2011 [4]
Tetrachloroethylene	10	ARBCA, 2021	5900	1200	ARBCA, 2021
1,1,1-Trichloroethane	10 000	BC CSR Schedule 3.2	95 000	13 000	MOECC, 2011
1,1,2-Trichloroethane	12	BC CSR Schedule 3.2	4100	910	MOECC, 2011 [4]
Trichloroethylene	5	ARBCA, 2021	540	110	ARBCA, 2021
Vinyl Chloride	2	ARBCA, 2021	470	99	ARBCA, 2021
Pesticides					
Aldicarb	-		-	-	
Aldrin	-		-	-	
Atrazine	5	HC, 2019	-	-	
Azinphos-methyl	20	HC, 2019	-	-	
Bendiocarb	40	AEP, 2019	-	-	
Bromoxynil	5	HC, 2019	-	-	
Carbaryl	90	HC, 2019	-	-	
Carbofuran	90	HC, 2019	-	-	
Chlorothalonil	140	AEP, 2019	-	-	
Chlorpyrifos	90	HC, 2019	-	-	
Cyanazine	10	AEP, 2019	-	-	
2,4-D	100	HC, 2019	-	-	
DDT	93	AEP, 2019	-	-	
Diazinon	20	HC, 2019	-	-	
Dicamba	120	HC, 2019	-	-	
Dichlorfop-methyl	-		-	-	
Dieldrin	-		-	-	
Dimethoate	20	HC, 2019	-	-	
Dinoseb	-		-	-	
Diquat	70	HC, 2019	-	-	
Diuron	150	HC, 2019	-	-	
Endosulfan	57	AEP, 2019	-	-	
Endrin	2.8	AEP, 2019	-	-	
Glyphosate	280	HC, 2019	-	-	
Heptachlor	0.052	AEP, 2019	51	2	AEP, 2019
Lindane	2.8	AEP, 2019	-	-	
Linuron	19	AEP, 2019	-	-	
Malathion	190	HC, 2019	-	-	
MCPA	100	HC, 2019	-	-	
Methoxychlor	-		-	-	
Metolachlor	50	HC, 2019	-	-	
Metribuzin	80	HC, 2019	-	-	
Paraquat	10	HC, 2019	-	-	
Parathion	-		-	-	
Phorate	2	HC, 2019	-	-	
Picloram	190	HC, 2019	-	-	
Simazine	10	HC, 2019	-	-	
Tebuthiuron	660	AEP, 2019	-	-	
Terbufos	1	HC, 2019	-	-	
Toxaphene	0.43	AEP, 2019	75 000	2900	AEP, 2019
Triallate	120	AEP, 2019	-	-	

Land Use	Commercial				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Trifluralin	45	HC, 2019	-	-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	0.2 [7]	HC, 2019	-	-	
Perfluorooctane sulfonate (PFOS)	0.6 [7]	HC, 2019	-	-	
Perfluorobutanoate (PFBA)	30	HC, 2019	-	-	
Perfluorobutane sulfonate (PFBS)	15	HC, 2019	-	-	
Perfluorohexanesulfonate (PFHxS)	0.6	HC, 2019	-	-	
Perfluoropentanoate (PFPeA)	0.2	HC, 2019	-	-	
Perfluorohexanoate (PFHxA)	0.2	HC, 2019	-	-	
Perfluoroheptanoate (PFHpA)	0.2	HC, 2019	-	-	
Perfluorononanoate (PFNA)	0.02	HC, 2019	-	-	
Other Parameters					
Polychlorinated Biphenyl (Total PCB)	9.4	AEP, 2019	250	180	MOECC, 2011 [4]
Dioxins and Furans (TEQ) [6]	0.00012	AEP, 2019	0.45	0.37	MOECC, 2011
Pentachlorophenol (PCP)	60	HC, 2019	-	-	
Organotins - Tributyltin	0.74	USEPA, 2019 [5]	-	-	
Ethylene Glycol	31 000	AEP, 2019	NGR	NGR	AEP, 2019
Propylene Glycol	-		-	-	
Phenol	570	AEP, 2019	NGR	45 000 000	AEP, 2019

Notes:

[1] All values in µg/L unless otherwise noted.

[2] "-" indicates no guideline available; ">SOL" means no criteria are shown as theoretical aqueous solubilities may be exceeded; "NGR" indicates no guideline required.

[3] Health Canada MAC (Maximum Acceptable Concentration), IMAC (Interim MAC), AO (Aesthetic Objectives), OG (Operational Guidance) and ALARA (As Low As Reasonably Achievable) criteria are shown for the Potable Groundwater Drinking Water pathway, where applicable. However, Health Canada AO and OG values are not considered as potential Tier I EQS values for this pathway.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1 x 10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[7] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Groundwater - Industrial Land Use (µg/L)

Land Use	Industrial				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Inorganic Parameters					
Aluminum	100	HC, 2019 (OG)	-	-	
Antimony	6	HC, 2019	-	-	
Arsenic	10	HC, 2019 (ALARA)	-	-	
Barium	1000	HC, 2019	-	-	
Beryllium	4	MOECC, 2011	-	-	
Boron	5000	HC, 2019	-	-	
Cadmium	5	HC, 2019	-	-	
Chromium (hexavalent)	50	HC, 2019	-	-	
Chromium (total)	50	HC, 2019	-	-	
Cobalt	3.8	MOECC, 2011	-	-	
Copper	2000	HC, 2019 (MAC)	-	-	
Cyanide	200	HC, 2019	-	-	
Iron	300	HC, 2019 (AO)	-	-	
Lead	5	HC, 2019 (ALARA)	-	-	
Manganese	120	HC, 2019	-	-	
Mercury (total)	1	HC, 2019	-	-	
Molybdenum	70	MOECC, 2011	-	-	
Nickel	100	MOECC, 2011	-	-	
Selenium	50	HC, 2019	-	-	
Silver	Not required	HC, 2019	-	-	
Strontium	2400	USEPA, 2019 [5]	-	-	
Thallium	2	MOECC, 2011	-	-	
Tin	2400	USEPA, 2019 [5]	-	-	
Uranium	20	HC, 2019	-	-	
Vanadium	6.2	MOECC, 2011	-	-	
Zinc	5000	HC, 2019 (AO)	-	-	
General Chemistry Parameters					
Chloride	250 000	HC, 2019 (AO)	-	-	
Sodium	200 000	HC, 2019 (AO)	-	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	5	ARBCA, 2021	32 000	6300	ARBCA, 2021
Toluene	24	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Ethylbenzene	1.6	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Xylene	20	ARBCA, 2021	>Sol	>Sol	ARBCA, 2021
Modified TPH (Gas)	4400	ARBCA, 2021	> Sol	>Sol	ARBCA, 2021
Modified TPH (Fuel)	3200	ARBCA, 2021	> Sol	>Sol	ARBCA, 2021
Modified TPH (Lube)	7800	ARBCA, 2021	> Sol	> Sol	ARBCA, 2021
MTBE	15	HC, 2019 (AO)	40 000	4300	AEP, 2019
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	470	AEP, 2019	NGR	7000	AEP, 2019
1 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
2 - Methylnaphthalene	12	MOECC, 2011	-	-	MOECC, 2011
Acenaphthene	1400	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene	4.5	MOECC, 2011 [4]	17 000	7500	MOECC, 2011 [4]
Anthracene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene	NGR	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene	940	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene	-	AEP, 2019	-	-	AEP, 2019
Pyrene	710	AEP, 2019	NGR	NGR	AEP, 2019
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	0.04	HC, 2019	-	-	
Benz[a]anthracene	-		-	-	
Benzo[a]pyrene	0.04	HC, 2019	-	-	
Benzo[b,j,k]fluoranthene isomers	-		-	-	
Benzo[g,h,i]perylene	-		-	-	
Chrysene	-		-	-	
Dibenz[a,h]anthracene	-		-	-	
Indeno[1,2,3-c,d]pyrene	-		-	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	100	HC, 2019	-	-	
Bromoform	100	HC, 2019	130 000	84 000	MOECC, 2011 [4]
Bromomethane	51	BC CSR Schedule 3.2	230	33	MOECC, 2011
Carbon Tetrachloride (Tetrachloromethane)	2	HC, 2019	80	6.9	AEP, 2019
Chlorobenzene	80	HC, 2019	2200	180	AEP, 2019

Land Use	Industrial				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Chloroethane	-		-	-	
Chloroform	80	AEP, 2019	3500	380	AEP, 2019
Chloromethane	38	USEPA, 2019 [5]	-	-	
Dibromochloromethane	190	AEP, 2019	250 000	10 000	AEP, 2019
1,2-Dichlorobenzene	200	HC, 2019	NGR	64 000	AEP, 2019
1,3-Dichlorobenzene	59	MOECC, 2011	-	-	
1,4-Dichlorobenzene	5	HC, 2019	32 000	2600	AEP, 2019
1,1-Dichloroethane	3700	BC CSR Schedule 3.2	44 000	6600	MOECC, 2011
1,2-Dichloroethane	5	HC, 2019	1200	130	AEP, 2019
1,1-Dichloroethylene	14	ARBCA, 2021	27 000	5600	ARBCA, 2021
cis-1,2-Dichloroethylene	70	ARBCA, 2021	23 000	4600	ARBCA, 2021
trans-1,2-Dichloroethylene	100	ARBCA, 2021	25 000	4900	ARBCA, 2021
1,2-Dichloropropane	9.9	BC CSR Schedule 3.2	2000	330	MOECC, 2011
1,3-Dichloropropene	6.7	BC CSR Schedule 3.2	610	100	MOECC, 2011
Ethylene Dibromide	0.34	BC CSR Schedule 3.2	120	51	MOECC, 2011 [4]
Methylene Chloride (Dichloromethane)	50	HC, 2019	410 000	43 000	AEP, 2019
Styrene	100	MOECC, 2011	160 000	26 000	MOECC, 2011
1,1,1,2- Tetrachloroethane	26	BC CSR Schedule 3.2	3800	660	MOECC, 2011 [4]
1,1,2,2-Tetrachloroethane	3.4	BC CSR Schedule 3.2	2100	630	MOECC, 2011 [4]
Tetrachloroethylene	10	ARBCA, 2021	5900	1200	ARBCA, 2021
1,1,1-Trichloroethane	10 000	BC CSR Schedule 3.2	95 000	13 000	MOECC, 2011
1,1,2-Trichloroethane	12	BC CSR Schedule 3.2	4100	910	MOECC, 2011 [4]
Trichloroethylene	5	ARBCA, 2021	540	110	ARBCA, 2021
Vinyl Chloride	2	ARBCA, 2021	940	200	ARBCA, 2021
Pesticides					
Aldicarb	-		-	-	
Aldrin	-		-	-	
Atrazine	5	HC, 2019	-	-	
Azinphos-methyl	20	HC, 2019	-	-	
Bendiocarb	40	AEP, 2019	-	-	
Bromoxynil	5	HC, 2019	-	-	
Carbaryl	90	HC, 2019	-	-	
Carbofuran	90	HC, 2019	-	-	
Chlorothalonil	140	AEP, 2019	-	-	
Chlorpyrifos	90	HC, 2019	-	-	
Cyanazine	10	AEP, 2019	-	-	
2,4-D	100	HC, 2019	-	-	
DDT	93	AEP, 2019	-	-	
Diazinon	20	HC, 2019	-	-	
Dicamba	120	HC, 2019	-	-	
Dichlorfop-methyl	-		-	-	
Dieldrin	-		-	-	
Dimethoate	20	HC, 2019	-	-	
Dinoseb	-		-	-	
Diquat	70	HC, 2019	-	-	
Diuron	150	HC, 2019	-	-	
Endosulfan	57	AEP, 2019	-	-	
Endrin	2.8	AEP, 2019	-	-	
Glyphosate	280	HC, 2019	-	-	
Heptachlor	0.052	AEP, 2019	51	2	AEP, 2019
Lindane	2.8	AEP, 2019	-	-	
Linuron	19	AEP, 2019	-	-	
Malathion	190	HC, 2019	-	-	
MCPA	100	HC, 2019	-	-	
Methoxychlor	-		-	-	
Metolachlor	50	HC, 2019	-	-	
Metribuzin	80	HC, 2019	-	-	
Paraquat	10	HC, 2019	-	-	
Parathion	-		-	-	
Phorate	2	HC, 2019	-	-	
Picloram	190	HC, 2019	-	-	
Simazine	10	HC, 2019	-	-	
Tebuthiuron	660	AEP, 2019	-	-	
Terbufos	1	HC, 2019	-	-	
Toxaphene	0.43	AEP, 2019	75 000	2900	AEP, 2019
Triallate	120	AEP, 2019	-	-	

Land Use	Industrial				
Pathway	Potable Groundwater Drinking Water		Vapour Migration from Groundwater to Indoor Air		
Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference
Trifluralin	45	HC, 2019	-	-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	0.2 [7]	HC, 2019	-	-	
Perfluorooctane sulfonate (PFOS)	0.6 [7]	HC, 2019	-	-	
Perfluorobutanoate (PFBA)	30	HC, 2019	-	-	
Perfluorobutane sulfonate (PFBS)	15	HC, 2019	-	-	
Perfluorohexanesulfonate (PFHxS)	0.6	HC, 2019	-	-	
Perfluoropentanoate (PFPeA)	0.2	HC, 2019	-	-	
Perfluorohexanoate (PFHxA)	0.2	HC, 2019	-	-	
Perfluoroheptanoate (PFHpA)	0.2	HC, 2019	-	-	
Perfluorononanoate (PFNA)	0.02	HC, 2019	-	-	
Other Parameters					
Polychlorinated Biphenyl (Total PCB)	9.4	AEP, 2019	250	180	MOECC, 2011 [4]
Dioxins and Furans (TEQ) [6]	0.00012	AEP, 2019	0.45	0.37	MOECC, 2011
Pentachlorophenol (PCP)	60	HC, 2019	-	-	
Organotins - Tributyltin	0.74	USEPA, 2019 [5]	-	-	
Ethylene Glycol	31 000	AEP, 2019	NGR	NGR	AEP, 2019
Propylene Glycol	-		-	-	
Phenol	570	AEP, 2019	NGR	45 000 000	AEP, 2019

Notes:

[1] All values in µg/L unless otherwise noted.

[2] "-" indicates no guideline available; ">SOL" means no criteria are shown as theoretical aqueous solubilities may be exceeded; "NGR" indicates no guideline required.

[3] Health Canada MAC (Maximum Acceptable Concentration), IMAC (Interim MAC), AO (Aesthetic Objectives), OG (Operational Guidance) and ALARA (As Low As Reasonably Achievable) criteria are shown for the Potable Groundwater Drinking Water pathway, where applicable. However, Health Canada AO and OG values are not considered as potential Tier I EQS values for this pathway.

[4] Value has been adjusted from its original jurisdictional value, to reflect a 1 x 10^{-05} Target Cancer Risk Level.

[5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.

[6] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".

[7] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Sediment (mg/kg)

Media		Sediment	
Pathway		Freshwater Sediment	Marine Sediment
Parameter	Units	Value	Value
Inorganic Parameters			
Aluminum	mg/kg	-	-
Antimony	mg/kg	25	25
Arsenic	mg/kg	17	41.6
Barium	mg/kg	-	130
Beryllium	mg/kg	-	-
Boron (Total)	mg/kg	-	-
Cadmium	mg/kg	3.5	4.2
Chromium (hexavalent)	mg/kg	-	-
Chromium (total)	mg/kg	90	160
Cobalt	mg/kg	-	-
Copper	mg/kg	197	108
Cyanide	mg/kg	-	-
Iron	mg/kg	43,766	-
Lead	mg/kg	91.3	112
Manganese	mg/kg	1100	-
Mercury (total)	mg/kg	0.486	0.7
Molybdenum	mg/kg	-	-
Nickel	mg/kg	75	50
Selenium	mg/kg	2	2
Silver	mg/kg	0.5	2.2
Strontium	mg/kg	-	-
Thallium	mg/kg	-	-
Tin	mg/kg	-	48
Uranium	mg/kg	-	-
Vanadium	mg/kg	-	-
Zinc	mg/kg	315	271
General Chemistry Parameters			
Chloride	mg/kg	-	-
Sodium	mg/kg	-	-
Petroleum Hydrocarbon (PHC) Parameters			
Benzene	mg/kg	1.2	1.2
Toluene	mg/kg	1.4	1.4
Ethylbenzene	mg/kg	1.2	1.2
Xylene	mg/kg	1.3	1.3
Modified TPH (Gas)	mg/kg	15	15
Modified TPH (Fuel)	mg/kg	25	25
Modified TPH (Lube)	mg/kg	43	43
MTBE	mg/kg	-	-
Total TPH	mg/kg	500	500
Polycyclic Aromatic Hydrocarbons (PAH) Parameters			
Naphthalene	mg/kg	0.391	0.391
1 - Methylnaphthalene	mg/kg	0.201	0.201
2 - Methylnaphthalene	mg/kg	0.201	0.201
Acenaphthene	mg/kg	0.0889	0.0889
Acenaphthylene	mg/kg	0.128	0.128
Anthracene	mg/kg	0.245	0.245
Fluoranthene	mg/kg	2.355	1.494
Fluorene	mg/kg	0.144	0.144

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Sediment (mg/kg)

Media		Sediment	
Pathway		Freshwater Sediment	Marine Sediment
Parameter	Units	Value	Value
Phenanthrene	mg/kg	0.515	0.544
Pyrene	mg/kg	0.875	1.398
Benz[a]anthracene	mg/kg	0.385	0.693
Benzo[a]pyrene	mg/kg	0.782	0.763
Benzo[b,j,k]fluoranthene isomers	mg/kg	13.4	4.5
Benzo[g,h,i]perylene	mg/kg	0.32	0.78
Chrysene	mg/kg	0.862	0.846
Dibenz[a,h]anthracene	mg/kg	0.135	0.135
Indeno[1,2,3-c,d]pyrene	mg/kg	3.2	0.88
Volatile Organic Compound (VOC) Parameters			
Bromodichloromethane	mg/kg	-	-
Bromoform	mg/kg	0.65	-
Bromomethane	mg/kg	-	-
Carbon Tetrachloride (Tetrachloromethane)	mg/kg	1.2	-
Chlorobenzene	mg/kg	0.41	-
Chloroethane	mg/kg	-	-
Chloroform	mg/kg	-	-
Chloromethane	mg/kg	-	-
Dibromochloromethane	mg/kg	-	-
1,2-Dichlorobenzene	mg/kg	0.33	0.023
1,3-Dichlorobenzene	mg/kg	1.7	-
1,4-Dichlorobenzene	mg/kg	0.34	0.09
1,1-Dichloroethane	mg/kg	-	-
1,2-Dichloroethane	mg/kg	-	-
1,1-Dichloroethylene	mg/kg	-	-
cis-1,2-Dichloroethylene	mg/kg	-	-
trans-1,2-Dichloroethylene	mg/kg	-	-
1,2-Dichloropropane	mg/kg	-	-
1,3-Dichloropropene	mg/kg	-	-
Ethylene Dibromide	mg/kg	-	-
Methylene Chloride (Dichloromethane)	mg/kg	-	-
Styrene	mg/kg	-	-
1,1,1,2-Tetrachloroethane	mg/kg	-	-
1,1,2,2-Tetrachloroethane	mg/kg	1.4	-
Tetrachloroethylene	mg/kg	0.41	-
1,1,1-Trichloroethane	mg/kg	0.03	-
1,1,2-Trichloroethane	mg/kg	-	-
Trichloroethylene	mg/kg	0.22	-
Vinyl Chloride	mg/kg	-	-
Pesticides			
Aldicarb	mg/kg	-	-
Aldrin	mg/kg	0.08	0.005
Atrazine	mg/kg	-	-
Azinphos-methyl	mg/kg	-	-
Bendiocarb	mg/kg	-	-
Bromoxynil	mg/kg	-	-
Carbaryl	mg/kg	-	-
Carbofuran	mg/kg	-	-
Chlorothalonil	mg/kg	-	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Sediment (mg/kg)

Media		Sediment	
Pathway		Freshwater Sediment	Marine Sediment
Parameter	Units	Value	Value
Chlorpyrifos	mg/kg	-	-
Cyanazine	mg/kg	-	-
2,4-D	mg/kg	-	-
DDT	mg/kg	0.00477	0.00477
Diazinon	mg/kg	0.0074	-
Dicamba	mg/kg	-	-
Dichlorfop-methyl	mg/kg	-	-
Dieldrin	mg/kg	0.00667	0.0043
Dimethoate	mg/kg	-	-
Dinoseb	mg/kg	-	-
Diquat	mg/kg	-	-
Diuron	mg/kg	-	-
Endosulfan	mg/kg	0.006	-
Endrin	mg/kg	0.0624	0.0624
Glyphosate	mg/kg	-	-
Heptachlor	mg/kg	0.00274	0.00274
Lindane*	mg/kg	0.00138	0.00099
Linuron	mg/kg	-	-
Malathion*	mg/kg	0.00067	-
MCPA	mg/kg	-	-
Methoxychlor	mg/kg	0.019	-
Metolachlor	mg/kg	-	-
Metribuzin	mg/kg	-	-
Paraquat	mg/kg	-	-
Parathion	mg/kg	-	-
Phorate	mg/kg	-	-
Picloram	mg/kg	-	-
Simazine	mg/kg	-	-
Tebuthiuron	mg/kg	-	-
Terbufos	mg/kg	-	-
Toxaphene*	mg/kg	0.0001	0.0001
Triallate	mg/kg	-	-
Trifluralin	mg/kg	-	-
PFAS Substances			
Perfluorooctane sulfonate (PFOS)	mg/kg	-	-
Perfluorooctanoic acid (PFOA)	mg/kg	-	-
Perfluorobutanoate (PFBA)	mg/kg	-	-
Perfluorobutanesulfonate (PFBS)	mg/kg	-	-
Perfluorohexanesulfonate (PFHxS)	mg/kg	-	-
Perfluoropentanoate (PFPeA)	mg/kg	-	-
Perfluorohexanoate (PFHxA)	mg/kg	-	-
Perfluoroheptanoate (PFHpA)	mg/kg	-	-
Perfluorononanoate (PFNA)	mg/kg	-	-
Other Parameters			
Polychlorinated Biphenyls (Total PCBs)	mg/kg	0.277	0.189
Dioxins and Furans (TEQ)	ng·TEQ/kg	21.5	21.5
Pentachlorophenol (PCP)	mg/kg	0.4	0.36
Organotins - Tributyltin	mg/kg	0.07	0.07
Ethylene Glycol	mg/kg	-	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Sediment (mg/kg)

Media		Sediment	
Pathway		Freshwater Sediment	Marine Sediment
Parameter	Units	Value	Value
Propylene Glycol	mg/kg	-	-
Phenol	mg/kg	-	0.42

Notes:

All values expressed in mg/kg (dry weight bulk sediment concentration), unless otherwise noted.

"-" indicates no guideline available.

* indicates that the benchmark value is below currently achievable analytical RDLs. For sites with potential sediment contamination in relation to this substance, additional sediment assessment and/or consultation with provincial regulators should occur to confirm this substance is not likely to be present at levels that could adversely affect sediment biota.

For those organic parameters where partitioning to sediment organic carbon (OC) was considered in the guideline derivation process by the source agency, a default sediment OC content of 1% was assumed (i.e., Foc = 0.01). Such guideline values may be adjustable as a function of sediment OC content. The orginal sediment quality guideline derivation documentation should be consulted to verify the appropriateness of this adjustment (not all sediment quality guidelines for organics are adjustable on the basis of sediment OC), and the appropriate method by which to make such an adjustment, as well as any limits placed by the source agency on such adjustments.

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Soil - All Land Use (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial / Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Inorganic Parameters						
Aluminum	-	-	-	-	-	-
Antimony	20	20	20	20	40	40
Arsenic	17.1	17.1	17.1	17.1	26	26
Barium	400	400	390	390	670	670
Beryllium	5	5	5	5	8	8
Boron (Total)	120	120	120	120	120	120
Boron (mg/L in saturated paste extract)	3.3	3.3	3.3	3.3	7.9	7.9
Cadmium	3.8	3.8	1.9	1.9	1.9	1.9
Chromium (hexavalent)	0.4	0.4	0.4	0.4	1.4	1.4
Chromium (total)	64	64	64	64	87	87
Cobalt	20	20	20	20	180	180
Copper	63	63	63	63	91	91
Cyanide	0.9	0.9	0.11	0.11	0.11	0.11
Iron	-	-	-	-	-	-
Lead	70	70	32	32	32	32
Manganese	-	-	-	-	-	-
Mercury (total)	12	12	12	12	20	20
Molybdenum	4	4	4	4	40	40
Nickel	45	45	45	45	89	89
Selenium	1	1	1	1	2.9	2.9
Silver	20	20	20	20	40	40
Strontium	-	-	-	-	-	-
Thallium	1	1	1.4	1.4	3.6	3.6
Tin	5	5	5	5	300	300
Uranium	33	33	33	33	33	33
Vanadium	18	18	18	18	18	18
Zinc	200	200	250	250	340	340
General Chemistry Parameters						
Chloride	350	350	350	350	2500	2500
Sodium	200	200	200	200	1000	1000
Petroleum Hydrocarbons (PHC) Parameters						
Benzene	18	18	60	31	310	180
Toluene	110	75	90	75	330	250
Ethylbenzene	120	55	120	55	430	300
Xylene	65	95	65	95	230	350
Modified TPH (Gas)	210	210	210	210	320	320
Modified TPH (Fuel)	150	150	150	150	260	260
Modified TPH (Lube)	1300	300	1300	300	2500	1700
MTBE	31	25	31	25	63	50
Polycyclic Aromatic Hydrocarbons (PAH) Parameters						
Non-Carcinogenic PAH Compounds						
Naphthalene	0.75	0.6	0.75	0.6	28	22
1 - Methylnaphthalene	-	-	-	-	-	-
2 - Methylnaphthalene	-	-	-	-	-	-
Acenaphthene	21.5	21.5	21.5	21.5	46,000	46,000
Acenaphthylene	-	-	-	-	-	-
Anthracene	2.5	2.5	2.5	2.5	32	32
Fluoranthene	15.4	15.4	15.4	15.4	180	180
Fluorene	15.4	15.4	15.4	15.4	-	-
Phenanthrene	7.8	6.2	7.8	6.2	16	12
Pyrene	7.7	7.7	7.7	7.7	99000	99000
Carcinogenic PAH Compounds						
BaP Total Potency Equivalents	-	-	-	-	-	-
Benz[a]anthracene	0.63	0.5	0.63	0.5	1.3	1
Benzo[a]pyrene	0.6	0.6	0.6	0.6	72	72
Benzo[b,j,k]fluoranthene isomers	6.2	6.2	6.2	6.2	19	15
Benzo[g,h,i]perylene	8.3	6.6	8.3	6.6	17	13
Chrysene	6.2	6.2	6.2	6.2	18	14
Dibenz[a,h]anthracene	-	-	-	-	-	-
Indeno[1,2,3-c,d]pyrene	0.48	0.38	0.48	0.38	0.95	0.76

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Soil - All Land Use (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial / Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Volatile Organic Compound (VOC) Parameters						
Bromodichloromethane	-	-	-	-	-	-
Bromoform	-	-	-	-	-	-
Bromomethane	-	-	-	-	-	-
Carbon Tetrachloride (Tetrachloromethane)	7.3	5.8	7.3	5.8	15	12
Chlorobenzene	7.5	6	7.5	6	15	12
Chloroethane	-	-	-	-	-	-
Chloroform	43	34	43	34	85	68
Chloromethane	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-
1,2-Dichlorobenzene	4.3	3.4	4.3	3.4	8.5	6.8
1,3-Dichlorobenzene	6	4.8	6	4.8	12	9.6
1,4-Dichlorobenzene	4.5	3.6	4.5	3.6	9	7.2
1,1-Dichloroethane	11	8.4	11	8.4	21	17
1,2-Dichloroethane	29	29	29	29	29	29
1,1-Dichloroethylene	43	43	43	43	130	100
cis-1,2-Dichloroethylene	84	84	84	84	940	940
trans-1,2-Dichloroethylene	84	84	84	84	940	940
1,2-Dichloropropane	31	25	31	25	63	50
1,3-Dichloropropene	31	25	31	25	63	50
Ethylene Dibromide	-	-	-	-	-	-
Methylene Chloride (Dichloromethane)	0.98	0.78	0.98	0.78	2	1.6
Styrene	22	17	22	17	43	34
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-
Tetrachloroethylene	4.5	4.5	4.5	4.5	30	30
1,1,1-Trichloroethane	22	18	22	18	44	35
1,1,2-Trichloroethane	100	80	100	80	200	160
Trichloroethylene	3	3	3	3	50	50
Vinyl Chloride	4.3	3.4	4.3	3.4	8.5	6.8
Pesticides						
Aldicarb	-	-	-	-	-	-
Aldrin	0.0024	0.0024	0.0024	0.0024	0.11	0.088
Atrazine	-	-	-	-	-	-
Azinphos-methyl	-	-	-	-	-	-
Bendiocarb	-	-	-	-	-	-
Bromoxynil	-	-	-	-	-	-
Carbaryl	-	-	-	-	-	-
Carbofuran	-	-	-	-	-	-
Chlorothalonil	-	-	-	-	-	-
Chlorpyrifos	-	-	-	-	-	-
Cyanazine	-	-	-	-	-	-
2,4-D	-	-	-	-	-	-
DDT	0.7	0.7	0.7	0.7	0.0012	0.0012
Diazinon	-	-	-	-	-	-
Dicamba	-	-	-	-	-	-
Dichlorfop-methyl	-	-	-	-	-	-
Dieldrin	0.00096	0.00096	0.0024	0.0024	0.11	0.088
Dimethoate	-	-	-	-	-	-
Dinoseb	-	-	-	-	-	-
Diquat	-	-	-	-	-	-
Diuron	-	-	-	-	-	-
Endosulfan	0.023	0.023	0.023	0.023	0.38	0.3
Endrin	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
Glyphosate	-	-	-	-	-	-
Heptachlor	0.25	0.2	0.25	0.2	0.5	0.4
Lindane	-	-	-	-	-	-
Linuron	-	-	-	-	-	-
Malathion	-	-	-	-	-	-
MCPA	-	-	-	-	-	-
Methoxychlor	0.13	0.13	0.13	0.13	4100	4100
Metolachlor	-	-	-	-	-	-
Metribuzin	-	-	-	-	-	-
Paraquat	-	-	-	-	-	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Soil - All Land Use (mg/kg)

Land Use	Agricultural		Residential / Parkland		Commercial / Industrial	
Parameter	**Fine**	**Coarse**	**Fine**	**Coarse**	**Fine**	**Coarse**
Parathion	-	-	-	-	-	-
Phorate	-	-	-	-	-	-
Picloram	-	-	-	-	-	-
Simazine	-	-	-	-	-	-
Tebuthiuron	0.046	0.046	0.046	0.046	0.6	0.6
Terbufos	-	-	-	-	-	-
Toxaphene	-	-	-	-	-	-
Triallate	-	-	-	-	-	-
Trifluralin	-	-	-	-	-	-
PFAS Substances						
Perfluorooactanoic acid (PFOA)	-	-	-	-	-	-
Perfluorooctane sulfonate (PFOS)	0.01	0.01	0.01	0.01	61	61
Perfluorobutanoate (PFBA)	-	-	-	-	-	-
Perfluorobutane sulfonate (PFBS)	-	-	-	-	-	-
Perfluorohexanesulfonate (PFHxS)	-	-	-	-	-	-
Perfluoropentanoate (PFPeA)	-	-	-	-	-	-
Perfluorohexanoate (PFHxA)	-	-	-	-	-	-
Perfluoroheptanoate (PFHpA)	-	-	-	-	-	-
Perfluorononanoate (PFNA)	-	-	-	-	-	-
Other Parameters						
Polychlorinated Biphenyls (Total PCB)	1.3	1.3	1.3	1.3	1.1	1.1
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.00001	0.00001	0.000013	0.000013	0.000099	0.000099
Pentachlorophenol (PCP)	0.013	0.013	0.013	0.013	28	28
Organotins - Tributyltin	-	-	-	-	-	-
Ethylene Glycol	1100	1100	1100	1100	1800	1800
Propylene Glycol	NGR	NGR	NGR	NGR	NGR	NGR
Phenol	9.4	9.4	9.4	9.4	9.4	9.4

Notes:

All values in mg/kg unless otherwise noted.

NGR=no guideline required. CCME applies the NGR designation to substances that were considered for ecological soil quality guideline derivation, but were deemed to not require such a guideline. This can be due to various reasons including substance physical-chemical, environmental fate and behaviour and toxicological properties, which may partially or collectively indicate a substance will not occur to any significant extent in soil and/or will not pose an ecological risk if it does occur in soil.

"-" indicates no ecological soil quality guideline was identified.

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Surface Water (µg/L)

Media		Surface Water	
Pathway		Fresh Water	Marine Water
Paramater	Units	Value	Value
Inorganic Parameters			
Aluminum	µg/L	5	-
Antimony	µg/L	9	250
Arsenic	µg/L	5	12.5
Barium	µg/L	1000	500
Beryllium	µg/L	0.15	100
Boron	µg/L	1500	1200
Cadmium	µg/L	0.09	0.12
Chromium (hexavalent)	µg/L	1	1.5
Chromium (total)	µg/L	8.9	56
Cobalt	µg/L	1	4
Copper	µg/L	2	2
Cyanide	µg/L	5	1
Iron	µg/L	300	-
Lead	µg/L	1	2
Manganese	µg/L	430	-
Mercury (total)	µg/L	0.026	0.016
Methylmercury	µg/L	0.004	0.004
Molybdenum	µg/L	73	1000
Nickel	µg/L	25	8.3
Selenium	µg/L	1	2
Silver	µg/L	0.25	1.5
Strontium	µg/L	21000	-
Thallium	µg/L	0.8	0.3
Tin	µg/L	-	-
Uranium	µg/L	15	8.5
Vanadium	µg/L	120	5
Zinc	µg/L	7	10
General Chemistry Parameters			
Ammonia	µg/L	pH and temperature dependent; consult CCME fact sheet.	pH, salinity and temperature dependent; consult BCMOE schedule.
Chloride	µg/L	120,000	No more than a 10% change in ambient sea water salinity (as NaCl).
Colour	TCU	True Colour: Mean absorbance of filtered samples at 456 nm shall not be significantly higher than seasonally adjusted expected value for system under consideration. Apparent Colour: Mean percent transmission of white light per metre shall not be significantly less than seasonally adjusted value for system under consideration (CCME, 2001).	
Fluoride	µg/L	120	1500
Hydrogen Sulphide	µg/L	2	-
Nitrate (as N)	µg/L	13,000	200,000
Nitrate + Nitrite (as N)	µg/L	-	-
Nitrite (as N)	µg/L	60	-
pH	Units	6.5 to 9	7.0 to 8.7
Sodium	µg/L	-	-
Sulphate	µg/L	128,000	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Surface Water (µg/L)

Media		Surface Water	
Pathway		Fresh Water	Marine Water
Paramater	Units	Value	Value
Total Dissolved Solids (TDS)	ug/L	-	-
Petroleum Hydrocarbons (PHC) Parameters			
Benzene	µg/L	2100	2100
Toluene	µg/L	770	770
Ethylbenzene	µg/L	320	320
Xylene	µg/L	330	330
Modified TPH (Gas)	µg/L	1500	1500
Modified TPH (Fuel)	µg/L	100	100
Modified TPH (Lube)	µg/L	100	100
MTBE	µg/L	10,000	5000
Polycyclic Aromatic Hydrocarbons (PAH) Parameters			
Non-Carcinogenic PAH Compounds			
Naphthalene	µg/L	1.1	1.4
1 - Methylnaphthalene	µg/L	2	1
2 - Methylnaphthalene	µg/L	2	1
Acenaphthene	µg/L	5.8	6
Acenaphthylene	µg/L	-	-
Anthracene	µg/L	0.012	0.1
Fluoranthene	µg/L	0.04	0.2
Fluorene	µg/L	3	12
Phenanthrene	µg/L	0.4	0.3
Pyrene	µg/L	0.025	0.02
Carcinogenic PAH Compounds			
BaP Total Potency Equivalents	µg/L	-	-
Benz[a]anthracene	µg/L	0.018	-
Benzo[a]pyrene	µg/L	0.015	0.01
Benzo[b,j,k]fluoranthene isomers	µg/L	-	-
Benzo[g,h,i]perylene	µg/L	-	-
Chrysene	µg/L	0.1	0.1
Dibenz[a,h]anthracene	µg/L	-	-
Indeno[1,2,3-c,d]pyrene	µg/L	-	-
Volatile Organic Compound (VOC) Parameters			
Bromodichloromethane	µg/L	200	6400
Bromoform	µg/L	60	6400
Bromomethane	µg/L	0.9	6400
Carbon Tetrachloride (Tetrachloromethane)	µg/L	13.3	13
Chlorobenzene	µg/L	1.3	25
Chloroethane	µg/L	1100	-
Chloroform	µg/L	1.8	2
Chloromethane	µg/L	700	6400
Dibromochloromethane	µg/L	40	6400
1,2-Dichlorobenzene	µg/L	0.7	42
1,3-Dichlorobenzene	µg/L	150	150
1,4-Dichlorobenzene	µg/L	26	26
1,1-Dichloroethane	µg/L	200	-
1,2-Dichloroethane	µg/L	100	100
1,1-Dichloroethylene	µg/L	40	-
cis-1,2-Dichloroethylene	µg/L	200	-
trans-1,2-Dichloroethylene	µg/L	200	-
1,2-Dichloropropane	µg/L	0.7	3040
1,3-Dichloropropene	µg/L	7	-
Ethylene Dibromide	µg/L	5	-
Methylene Chloride (Dichloromethane)	µg/L	98.1	98
Styrene	µg/L	72	-
1,1,1,2-Tetrachloroethane	µg/L	20	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Surface Water (µg/L)

Media		Surface Water	
Pathway		Fresh Water	Marine Water
Paramater	Units	Value	Value
1,1,2,2-Tetrachloroethane	µg/L	70	-
Tetrachloroethylene	µg/L	110	110
1,1,1-Trichloroethane	µg/L	10	-
1,1,2-Trichloroethane	µg/L	800	-
Trichloroethylene	µg/L	21	20
Vinyl Chloride	µg/L	600	-
Pesticides			
Aldicarb	µg/L	1	0.15
Aldrin	µg/L	See Dieldrin;ISG applies to sum of aldrin + dieldrin	-
Atrazine	µg/L	1.8	-
Azinphos-methyl	µg/L	0.01	0.01
Bendiocarb	µg/L	-	-
Bromoxynil	µg/L	5	-
Carbaryl	µg/L	0.2	0.29
Carbofuran	µg/L	1.8	-
Chlorothalonil	µg/L	0.18	0.36
Chlorpyrifos	µg/L	0.002	0.002
Cyanazine	µg/L	2	-
2,4-D	µg/L	4	4
DDT*	µg/L	0.001	0.001
Diazinon	µg/L	0.003	0.82
Dicamba	µg/L	10	-
Dichlorfop-methyl	µg/L	6.1	-
Dieldrin*	µg/L	0.001	0.0019
Dimethoate	µg/L	6.2	-
Dinoseb	µg/L	0.05	-
Diquat	µg/L	0.5	-
Diuron	µg/L	1.6	-
Endosulfan	µg/L	0.003	0.002
Endrin*	µg/L	0.002	0.0023
Glyphosate	µg/L	800	-
Heptachlor*	µg/L	0.001	0.0036
Lindane	µg/L	0.01	-
Linuron	µg/L	7	-
Malathion	µg/L	0.1	0.1
MCPA	µg/L	2.6	4.2
Methoxychlor	µg/L	0.03	-
Metolachlor	µg/L	7.8	-
Metribuzin	µg/L	1	-
Paraquat	µg/L	16	-
Parathion	µg/L	0.008	-
Phorate	µg/L	-	-
Picloram	µg/L	29	-
Simazine	µg/L	10	-
Tebuthiuron	µg/L	1.6	-
Terbufos	µg/L	-	-
Toxaphene*	µg/L	0.008	0.0002
Triallate	µg/L	0.24	-
Trifluralin	µg/L	0.2	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Surface Water (µg/L)

Media		Surface Water	
Pathway		Fresh Water	Marine Water
Paramater	Units	Value	Value
PFAS Substances			
Perfluorooctane sulfonate (PFOS)	µg/L	6.8	-
Perfluorooctanoic acid (PFOA)	µg/L	-	-
Perfluorobutanoate (PFBA)	µg/L	-	-
Perfluorobutanesulfonate (PFBS)	µg/L	-	-
Perfluorohexanesulfonate (PFHxS)	µg/L	-	-
Perfluoropentanoate (PFPeA)	µg/L	-	-
Perfluorohexanoate (PFHxA)	µg/L	-	-
Perfluoroheptanoate (PFHpA)	µg/L	-	-
Perfluorononanoate (PFNA)	µg/L	-	-
Other Parameters			
Polychlorinated Biphenyls (Total PCB)	µg/L	0.001	-
Dioxins and Furans (TEQ)	µg/L	-	-
Pentachlorophenol (PCP)	µg/L	0.5	7.9
Organotins - Tributyltin	µg/L	0.008	0.001
Ethylene Glycol	µg/L	192,000	192,000
Propylene Glycol	µg/L	500,000	500,000
Phenol	µg/L	4	200

Notes:
All values in µg/L unless otherwise noted.
"-" indicates no guideline available.

* Indicates the benchmark value is below currently achievable analytical RDLs. For sites with potential surface water or groundwater contamination in relation to this substance, additional aquatic assessment and/or consultation with provincial regulators should occur to confirm this substance is not likely to be present at levels that could adversely affect aquatic biota.

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Groundwater (µg/L)

Groundwater		(>10 metres from Surface Water Body) Ground Water		(<10 metres from Surface Water Body) Ground Water	
Pathway		Discharge to Fresh Water	Discharge to Marine Water	Discharge to Fresh Water	Discharge to Marine Water
Parameter	Units	Value	Value	Value	Value
Inorganic Parameters					
Aluminum	µg/L	50	-	5	-
Antimony	µg/L	90	2500	9	250
Arsenic	µg/L	50	125	5	12.5
Barium	µg/L	10,000	5000	1000	500
Beryllium	µg/L	1.5	1000	0.15	100
Boron	µg/L	15,000	12,000	1500	1200
Cadmium	µg/L	0.9	1.2	0.09	0.12
Chromium (hexavalent)	µg/L	10	15	1	1.5
Chromium (total)	µg/L	89	560	8.9	56
Cobalt	µg/L	10	40	1	4
Copper	µg/L	20	20	2	2
Cyanide	µg/L	50	10	5	1
Iron	µg/L	3000	-	300	-
Lead	µg/L	10	20	1	2
Manganese	µg/L	4300	-	430	-
Mercury (total)	µg/L	0.26	0.16	0.026	0.016
Methylmercury	µg/L	0.04	0.04	0.004	0.004
Molybdenum	µg/L	730	10,000	73	1000
Nickel	µg/L	250	83	25	8.3
Selenium	µg/L	10	20	1	2
Silver	µg/L	2.5	15	0.25	1.5
Strontium	µg/L	210,000	-	21000	-
Thallium	µg/L	8	3	0.8	0.3
Tin	µg/L	-	-	-	-
Uranium	µg/L	150	85	15	8.5
Vanadium	µg/L	1200	50	120	5
Zinc	µg/L	70	100	7	10
General Chemistry Parameters					
Ammonia	µg/L	pH and temperature dependent; consult CCME fact sheet.	pH, salinity and temperature dependent; consult BCMOE schedule.	pH and temperature dependent; consult CCME fact sheet.	pH, salinity and temperature dependent; consult BCMOE schedule.
Chloride	µg/L	1,200,000	No more than a 10% change in ambient sea water salinity (as NaCl).	120,000	No more than a 10% change in ambient sea water salinity (as NaCl).
Colour	TCU	True Colour: Mean absorbance of filtered samples at 456 nm shall not be significantly higher than seasonally adjusted expected value for system under consideration. Apparent Colour: Mean percent transmission of white light per metre shall not be significantly less than seasonally adjusted value for system under consideration (CCME, 2001).		True Colour: Mean absorbance of filtered samples at 456 nm shall not be significantly higher than seasonally adjusted expected value for system under consideration. Apparent Colour: Mean percent transmission of white light per metre shall not be significantly less than seasonally adjusted value for system under consideration (CCME, 2001).	
Fluoride	µg/L	1200	15,000	120	1500
Hydrogen Sulphide	µg/L	20	-	2	-
Nitrate (as N)	µg/L	130,000	2,000,000	13,000	200,000
Nitrate + Nitrite (as N)	µg/L	-	-	-	-
Nitrite (as N)	µg/L	600	-	60	-
pH	Units	6.5 to 9	7.0 to 8.7	6.5 to 9	7.0 to 8.7
Sodium	µg/L	-	-	-	-
Sulphate	µg/L	1,280,000	-	128,000	-
Total Dissolved Solids (TDS)	µg/L	-	-	-	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Groundwater (µg/L)

Groundwater		(>10 metres from Surface Water Body) Ground Water		(<10 metres from Surface Water Body) Ground Water	
Pathway		Discharge to Fresh Water	Discharge to Marine Water	Discharge to Fresh Water	Discharge to Marine Water
Parameter	Units	Value	Value	Value	Value
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	µg/L	4600	4600	2100	2100
Toluene	µg/L	4200	4200	770	770
Ethylbenzene	µg/L	3200	3200	320	320
Xylene	µg/L	2800	2800	330	330
Modified TPH (Gas)	µg/L	13,000	13,000	1500	1500
Modified TPH (Fuel)	µg/L	840	840	100	100
Modified TPH (Lube)	µg/L	480	480	100	100
MTBE	µg/L	100,000	50,000	10,000	5000
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	µg/L	11	14	1.1	1.4
1 - Methylnaphthalene	µg/L	20	10	2	1
2 - Methylnaphthalene	µg/L	20	10	2	1
Acenaphthene	µg/L	58	60	5.8	6
Acenaphthylene	µg/L	-	-	-	-
Anthracene	µg/L	0.12	1	0.012	0.1
Fluoranthene	µg/L	0.4	2	0.04	0.2
Fluorene	µg/L	30	120	3	12
Phenanthrene	µg/L	4	3	0.4	0.3
Pyrene	µg/L	0.25	0.2	0.025	0.02
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	µg/L	-	-	-	-
Benz[a]anthracene	µg/L	0.18	-	0.018	-
Benzo[a]pyrene	µg/L	0.15	0.1	0.015	0.01
Benzo[b,j,k]fluoranthene isomers	µg/L	-	-	-	-
Benzo[g,h,i]perylene	µg/L	-	-	-	-
Chrysene	µg/L	1	1	0.1	0.1
Dibenz[a,h]anthracene	µg/L	-	-	-	-
Indeno[1,2,3-c,d]pyrene	µg/L	-	-	-	-
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	µg/L	2000	64,000	200	6400
Bromoform	µg/L	600	64,000	60	6400
Bromomethane	µg/L	9	64,000	0.9	6400
Carbon Tetrachloride (Tetrachloromethane)	µg/L	133	130	13.3	13
Chlorobenzene	µg/L	13	250	1.3	25
Chloroethane	µg/L	11,000	-	1100	-
Chloroform	µg/L	18	20	1.8	2
Chloromethane	µg/L	7000	64,000	700	6400
Dibromochloromethane	µg/L	400	64,000	40	6400
1,2-Dichlorobenzene	µg/L	7	420	0.7	42
1,3-Dichlorobenzene	µg/L	1500	1500	150	150
1,4-Dichlorobenzene	µg/L	260	260	26	26
1,1-Dichloroethane	µg/L	2000	-	200	-
1,2-Dichloroethane	µg/L	1000	1000	100	100
1,1-Dichloroethylene	µg/L	400	-	40	-
cis-1,2-Dichloroethylene	µg/L	2000	-	200	-
trans-1,2-Dichloroethylene	µg/L	2000	-	200	-
1,2-Dichloropropane	µg/L	7	30,400	0.7	3040
1,3-Dichloropropene	µg/L	70	-	7	-
Ethylene Dibromide	µg/L	50	-	5	-
Methylene Chloride (Dichloromethane)	µg/L	981	980	98.1	98
Styrene	µg/L	720	-	72	-
1,1,1,2-Tetrachloroethane	µg/L	200	-	20	-
1,1,2,2-Tetrachloroethane	µg/L	700	-	70	-
Tetrachloroethylene	µg/L	1100	1100	110	110
1,1,1-Trichloroethane	µg/L	100	-	10	-
1,1,2-Trichloroethane	µg/L	8000	-	800	-
Trichloroethylene	µg/L	210	200	21	20
Vinyl Chloride	µg/L	6000	-	600	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Groundwater (µg/L)

Groundwater		(>10 metres from Surface Water Body) Ground Water		(<10 metres from Surface Water Body) Ground Water	
Pathway		Discharge to Fresh Water	Discharge to Marine Water	Discharge to Fresh Water	Discharge to Marine Water
Parameter	Units	Value	Value	Value	Value
Pesticides					
Aldicarb	µg/L	10	1.5	1	0.15
Aldrin	µg/L	See Dieldrin;ISG applies to sum of aldrin + dieldrin	-	See Dieldrin;ISG applies to sum of aldrin + dieldrin	-
Atrazine	µg/L	18	-	1.8	-
Azinphos-methyl	µg/L	0.1	0.1	0.01	0.01
Bendiocarb	µg/L	-	-	-	-
Bromoxynil	µg/L	50	-	5	-
Carbaryl	µg/L	2	2.9	0.2	0.29
Carbofuran	µg/L	18	-	1.8	-
Chlorothalonil	µg/L	1.8	3.6	0.18	0.36
Chlorpyrifos	µg/L	0.02	0.02	0.002	0.002
Cyanazine	µg/L	20	-	2	-
2,4-D	µg/L	40	40	4	4
DDT*	µg/L	0.01	0.01	0.001	0.001
Diazinon	µg/L	0.03	8.2	0.003	0.82
Dicamba	µg/L	100	-	10	-
Dichlorfop-methyl	µg/L	61	-	6.1	-
Dieldrin*	µg/L	0.01	0.019	0.001	0.0019
Dimethoate	µg/L	62	-	6.2	-
Dinoseb	µg/L	0.5	-	0.05	-
Diquat	µg/L	5	-	0.5	-
Diuron	µg/L	16	-	1.6	-
Endosulfan	µg/L	0.03	0.02	0.003	0.002
Endrin*	µg/L	0.02	0.023	0.002	0.0023
Glyphosate	µg/L	8000	-	800	-
Heptachlor*	µg/L	0.01	0.036	0.001	0.0036
Lindane	µg/L	0.1	-	0.01	-
Linuron	µg/L	70	-	7	-
Malathion	µg/L	1	1	0.1	0.1
MCPA	µg/L	26	42	2.6	4.2
Methoxychlor	µg/L	0.3	-	0.03	-
Metolachlor	µg/L	78	-	7.8	-
Metribuzin	µg/L	10	-	1	-
Paraquat	µg/L	160	-	16	-
Parathion	µg/L	0.08	-	0.008	-
Phorate	µg/L	-	-	-	-
Picloram	µg/L	290	-	29	-
Simazine	µg/L	100	-	10	-
Tebuthiuron	µg/L	16	-	1.6	-
Terbufos	µg/L	-	-	-	-
Toxaphene*	µg/L	0.08	0.002	0.008	0.0002
Triallate	µg/L	2.4	-	0.24	-
Trifluralin	µg/L	2	-	0.2	-
PFAS Substances					
Perfluorooctane sulfonate (PFOS)	µg/L	68	-	6.8	-
Perfluorooctanoic acid (PFOA)	µg/L	-	-	-	-
Perfluorobutanoate (PFBA)	µg/L	-	-	-	-
Perfluorobutanesulfonate (PFBS)	µg/L	-	-	-	-
Perfluorohexanesulfonate (PFHxS)	µg/L	-	-	-	-
Perfluoropentanoate (PFPeA)	µg/L	-	-	-	-
Perfluorohexanoate (PFHxA)	µg/L	-	-	-	-
Perfluoroheptanoate (PFHpA)	µg/L	-	-	-	-
Perfluorononanoate (PFNA)	µg/L	-	-	-	-

Atlantic RBCA - Ecological Tier I Environmental Quality Standards (EQS) for Groundwater (µg/L)

Groundwater		(>10 metres from Surface Water Body) Ground Water		(<10 metres from Surface Water Body) Ground Water	
Pathway		Discharge to Fresh Water	Discharge to Marine Water	Discharge to Fresh Water	Discharge to Marine Water
Parameter	Units	Value	Value	Value	Value
Other Parameters					
Polychlorinated Biphenyls (Total PCB)	µg/L	0.01	-	0.001	-
Dioxins and Furans (TEQ)	µg/L	-	-	-	-
Pentachlorophenol (PCP)	µg/L	5	79	0.5	7.9
Organotins - Tributyltin	µg/L	0.08	0.01	0.008	0.001
Ethylene Glycol	µg/L	1,920,000	1,920,000	192,000	192,000
Propylene Glycol	µg/L	5,000,000	5,000,000	500,000	500,000
Phenol	µg/L	40	2000	4	200

Notes:
All values in µg/L unless otherwise noted.
"-" indicates no guideline available.

* Indicates the benchmark value is below currently achievable analytical RDLs. For sites with potential surface water or groundwater contamination in relation to this substance, additional aquatic assessment and/or consultation with provincial regulators should occur to confirm this substance is not likely to be present at levels that could adversely affect aquatic biota.

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Sediment - Freshwater and Marine (mg/kg)

Media		Sediment					
Pathway		Freshwater Sediment			Marine Sediment		
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference
Inorganic Parameters							
Aluminum	mg/kg	-			-		
Antimony	mg/kg	25	Recommended SQG-high value	Simpson et al., 2013	25	Recommended SQG-high value	Simpson et al., 2013
Arsenic	mg/kg	17	PEL	CCME	41.6	PEL	CCME
Barium	mg/kg	-			130	Based on TEL; no PEL or similar values identified	Buchman, 2008
Beryllium	mg/kg	-			-		
Boron (Total)	mg/kg	-			-		
Cadmium	mg/kg	3.5	PEL	CCME	4.2	PEL	CCME
Chromium (hexavalent)	mg/kg	-			-		
Chromium (total)	mg/kg	90	PEL	CCME	160	PEL	CCME
Cobalt	mg/kg	-			-		
Copper	mg/kg	197	PEL	CCME	108	PEL	CCME
Cyanide	mg/kg	-			-		
Iron	mg/kg	43,766	upper SWQG; Working sediment quality guidelines	BCMOE, 2017	-		
Lead	mg/kg	91.3	PEL	CCME	112	PEL	CCME
Manganese	mg/kg	1100	upper SWQG; Working sediment quality guidelines	BCMOE, 2017	-		
Mercury (total)	mg/kg	0.486	PEL	CCME	0.7		CCME
Molybdenum	mg/kg	-			-		
Nickel	mg/kg	75	upper SWQG; Working sediment quality guidelines	BCMOE, 2017	50	upper SWQG; Working sediment quality guidelines	BCMOE, 2017
Selenium	mg/kg	2	Alert concentration	BC MOE, 2014	2	Alert concentration	BCMOE, 2014
Silver	mg/kg	0.5	lower SWQG (upper SWQG not available); Working sediment quality guidelines	BCMOE, 2017	2.2	upper SWQG; Working sediment quality guidelines	BCMOE, 2017
Strontium	mg/kg	-			-		
Thallium	mg/kg	-			-		
Tin	mg/kg	-			48	Based on TEL; no PEL or similar values identified	Buchman, 2008
Uranium	mg/kg	-			-		
Vanadium	mg/kg	-			-		
Zinc	mg/kg	315	PEL	CCME	271	PEL	CCME
General Chemistry Parameters							
Chloride	mg/kg	-			-		
Sodium	mg/kg	-			-		
Petroleum Hydrocarbon (PHC) Parameters							
Benzene	mg/kg	1.2	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	1.2	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021
Toluene	mg/kg	1.4	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	1.4	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021
Ethylbenzene	mg/kg	1.2	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	1.2	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021
Xylene	mg/kg	1.3	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	1.3	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021
Modified TPH (Gas)	mg/kg	15	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	15	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021
Modified TPH (Fuel)	mg/kg	25	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	25	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Sediment - Freshwater and Marine (mg/kg)

Media		Sediment					
Pathway		Freshwater Sediment			Marine Sediment		
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference
Modified TPH (Lube)	mg/kg	43	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021	43	Chronic benchmark - narcosis-based (HC_5)@ 1% organic carbon; EqP approach; typical sediment type	ARBCA, 2021
MTBE	mg/kg	-			-		
Total TPH	mg/kg	500	Maximum Limit	ARBCA, 2021	500	Maximum Limit	ARBCA, 2021
Polycyclic Aromatic Hydrocarbons (PAH) Parameters							
Naphthalene	mg/kg	0.391	PEL	CCME	0.391	PEL	CCME
1 - Methylnaphthalene	mg/kg	0.201	PEL; assumed equal toxic potency as 2-methyl isomer	CCME	0.201	PEL; assumed equal toxic potency as 2-methyl isomer	CCME
2 - Methylnaphthalene	mg/kg	0.201	PEL	CCME	0.201	PEL	CCME
Acenaphthene	mg/kg	0.0889	PEL	CCME	0.0889	PEL	CCME
Acenaphthylene	mg/kg	0.128	PEL	CCME	0.128	PEL	CCME
Anthracene	mg/kg	0.245	PEL	CCME	0.245	PEL	CCME
Fluoranthene	mg/kg	2.355	PEL	CCME	1.494	PEL	CCME
Fluorene	mg/kg	0.144	PEL	CCME	0.144	PEL	CCME
Phenanthrene	mg/kg	0.515	PEL	CCME	0.544	PEL	CCME
Pyrene	mg/kg	0.875	PEL	CCME	1.398	PEL	CCME
Benz[a]anthracene	mg/kg	0.385	PEL	CCME	0.693	PEL	CCME
Benzo[a]pyrene	mg/kg	0.782	PEL	CCME	0.763	PEL	CCME
Benzo[b,j,k]fluoranthene isomers	mg/kg	13.4	upper SWQG for 'k' isomer; Working sediment quality guidelines	BCMOE, 2017	4.5	upper SWQG for all isomers @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017
Benzo[g,h,i]perylene	mg/kg	0.32	upper SWQG @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017	0.78	upper SWQG @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017
Chrysene	mg/kg	0.862	PEL	CCME	0.846	PEL	CCME
Dibenz[a,h]anthracene	mg/kg	0.135	PEL	CCME	0.135	PEL	CCME
Indeno[1,2,3-c,d]pyrene	mg/kg	3.2	upper SWQG @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017	0.88	upper SWQG @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017
Volatile Organic Compound (VOC) Parameters							
Bromodichloromethane	mg/kg	-			-		
Bromoform	mg/kg	0.65	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Bromomethane	mg/kg	-			-		
Carbon Tetrachloride (Tetrachloromethane)	mg/kg	1.2	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Chlorobenzene	mg/kg	0.41	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Chloroethane	mg/kg	-			-		
Chloroform	mg/kg	-			-		
Chloromethane	mg/kg	-			-		
Dibromochloromethane	mg/kg	-			-		
1,2-Dichlorobenzene	mg/kg	0.33	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	0.023	lower SWQG (upper SWQG not available) @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017
1,3-Dichlorobenzene	mg/kg	1.7	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
1,4-Dichlorobenzene	mg/kg	0.34	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	0.09	upper SWQG @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017
1,1-Dichloroethane	mg/kg	-			-		
1,2-Dichloroethane	mg/kg	-			-		
1,1-Dichloroethylene	mg/kg	-			-		
cis-1,2-Dichloroethylene	mg/kg	-			-		
trans-1,2-Dichloroethylene	mg/kg	-			-		
1,2-Dichloropropane	mg/kg	-			-		
1,3-Dichloropropene	mg/kg	-			-		
Ethylene Dibromide	mg/kg	-			-		
Methylene Chloride (Dichloromethane)	mg/kg	-			-		

Media		Sediment					
Pathway		Freshwater Sediment			Marine Sediment		
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference
Styrene	mg/kg	-			-		
1,1,1,2-Tetrachloroethane	mg/kg	-			-		
1,1,2,2-Tetrachloroethane	mg/kg	1.4	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Tetrachloroethylene	mg/kg	0.41	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
1,1,1-Trichloroethane	mg/kg	0.03	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
1,1,2-Trichloroethane	mg/kg	-			-		
Trichloroethylene	mg/kg	0.22	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Vinyl Chloride	mg/kg	-			-		
Pesticides							
Aldicarb	mg/kg	-			-		
Aldrin	mg/kg	0.08	upper SWQG @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017	0.005	lower SWQG (upper SWQG not available) @ 1% organic carbon; Working sediment quality guidelines	BCMOE, 2017
Atrazine	mg/kg	-			-		
Azinphos-methyl	mg/kg	-			-		
Bendiocarb	mg/kg	-			-		
Bromoxynil	mg/kg	-			-		
Carbaryl	mg/kg	-			-		
Carbofuran	mg/kg	-			-		
Chlorothalonil	mg/kg	-			-		
Chlorpyrifos	mg/kg	-			-		
Cyanazine	mg/kg	-			-		
2,4-D	mg/kg	-			-		
DDT	mg/kg	0.00477	PEL	CCME	0.00477	PEL	CCME
Diazinon	mg/kg	0.0074	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Dicamba	mg/kg	-			-		
Dichlorfop-methyl	mg/kg	-			-		
Dieldrin	mg/kg	0.00667	PEL	CCME	0.0043	PEL	CCME
Dimethoate	mg/kg	-			-		
Dinoseb	mg/kg	-			-		
Diquat	mg/kg	-			-		
Diuron	mg/kg	-			-		
Endosulfan	mg/kg	0.006	Lower of ESB for mixed isomers based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Endrin	mg/kg	0.0624	PEL	CCME	0.0624	PEL	CCME
Glyphosate	mg/kg	-			-		
Heptachlor	mg/kg	0.00274	PEL for heptachlor epoxide	CCME	0.00274	PEL for heptachlor epoxide	CCME
Lindane*	mg/kg	0.00138	PEL	CCME	0.00099	PEL	CCME
Linuron	mg/kg	-			-		
Malathion*	mg/kg	0.00067	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
MCPA	mg/kg	-			-		
Methoxychlor	mg/kg	0.019	Lower of ESB based on conventional and narcosis approaches; normalized to 1% TOC	USEPA, 2008	-		
Metolachlor	mg/kg	-			-		
Metribuzin	mg/kg	-			-		
Paraquat	mg/kg	-			-		
Parathion	mg/kg	-			-		
Phorate	mg/kg	-			-		
Picloram	mg/kg	-			-		

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Sediment - Freshwater and Marine (mg/kg)

Media		Sediment					
Pathway		Freshwater Sediment			Marine Sediment		
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference
Simazine	mg/kg	-			-		
Tebuthiuron	mg/kg	-			-		
Terbufos	mg/kg	-			-		
Toxaphene*	mg/kg	0.0001	ISQG, no PEL exists	CCME	0.0001	ISQG, no PEL exists	CCME
Triallate	mg/kg	-			-		
Trifluralin	mg/kg	-			-		
PFAS Substances							
Perfluorooctane sulfonate (PFOS)	mg/kg	-			-		
Perfluorooctanoic acid (PFOA)	mg/kg	-			-		
Perfluorobutanoate (PFBA)	mg/kg	-			-		
Perfluorobutanesulfonate (PFBS)	mg/kg	-			-		
Perfluorohexanesulfonate (PFHxS)	mg/kg	-			-		
Perfluoropentanoate (PFPeA)	mg/kg	-			-		
Perfluorohexanoate (PFHxA)	mg/kg	-			-		
Perfluoroheptanoate (PFHpA)	mg/kg	-			-		
Perfluorononanoate (PFNA)	mg/kg	-			-		
Other Parameters							
Polychlorinated Biphenyls (Total PCBs)	mg/kg	0.277	PEL	CCME	0.189	PEL	CCME
Dioxins and Furans (TEQ) [a]	ng TEQ/kg	21.5	PEL	CCME	21.5	PEL	CCME
Pentachlorophenol (PCP)	mg/kg	0.4	Sensitive use freshwater standard	BCMOECCS CSR Schedule 3.4	0.36	Sensitive use marine/estuarine standard	BCMOECCS CSR Schedule 3.4
Organotins - Tributyltin	mg/kg	0.07	Recommended SQG-high value @ 1% TOC	Simpson et al., 2013	0.07	Recommended SQG-high value @ 1% TOC	Simpson et al., 2013
Ethylene Glycol	mg/kg	-			-		
Propylene Glycol	mg/kg	-			-		
Phenol	mg/kg	-			0.42	Marine sediment quality standard	Washington DOE, 2013

Notes:
All values expressed in mg/kg (dry weight bulk sediment concentration), unless otherwise noted.
"-" indicates no guideline available.

* indicates that the benchmark value is below currently achievable analytical RDLs. For sites with potential sediment contamination in relation to this substance, additional sediment assessment and/or consultation with provincial regulators should occur to confirm this substance is not likely to be present at levels that could adversely affect sediment biota.
a. Dioxin and Furan TEQ is to be calculated following the approach presented in CCME (2001).
For any values adopted from BCMOECCS CSR Schedule 3.4, the values are for a "typical" site, rather than a "sensitive" site.
For those organic parameters where partitioning to sediment organic carbon (OC) was considered in the guideline derivation process by the source agency, a default sediment OC content of 1% was assumed (i.e., Foc = 0.01). Such guideline values may be adjustable as a function of sediment OC content. The orginal sediment quality guideline derivation documentation should be consulted to verify the appropriateness of this adjustment (not all sediment quality guidelines for organics are adjustable on the basis of sediment OC), and the appropriate method by which to make such an adjustment, as well as any limits placed by the source agency on such adjustments.

References for Sediment Quality Guideline Sources:
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Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Agricultural Land Use (mg/kg)

Land Use	Agricultural				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Inorganic Parameters					
Aluminum	-	-		-	
Antimony	20	20	AEP, 2019	25	MOECC, 2011
Arsenic	17.1	17.1	CCME	380	CCME
Barium	750	750	AEP, 2019	400	BC MOECCS Schedule 3.1
Beryllium	5	5	AEP, 2019	13	MOECC, 2011
Boron (Total)	-	-		120	MOECC, 2011
Boron (mg/L in saturated paste extract)	3.3	3.3	AEP, 2019	-	
Cadmium	10	10	CCME	3.8	CCME
Chromium (hexavalent)	0.4	0.4	AEP, 2019	150	BC MOECCS Schedule 3.1
Chromium (total)	64	64	CCME	160	MOECC, 2011
Cobalt	20	20	AEP, 2019	180	MOECC, 2011
Copper	63	63	CCME	300	CCME
Cyanide	0.9	0.9	CCME	11	CCME
Iron	-	-		-	
Lead	300	300	CCME	70	CCME
Manganese	-	-		-	
Mercury (total)	12	12	CCME	20	MOECC, 2011
Molybdenum	4	4	AEP, 2019	6.9	MOECC, 2011
Nickel	45	45	CCME	528	CCME
Selenium	1	1	CCME	4.5	CCME
Silver	20	20	AEP, 2019	-	
Strontium	-	-		-	
Thallium	1.4	1.4	CCME	1	CCME
Tin	5	5	AEP, 2019	-	
Uranium	500	500	CCME	33	CCME
Vanadium	130	130	CCME	18	MOECC, 2011
Zinc	200	200	CCME	640	CCME
General Chemistry Parameters					
Chloride	350	350	BC MOECCS Schedule 3.1	-	
Sodium	200	200	BC MOECCS Schedule 3.1	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	60	31	ARBCA, 2021	18	ARBCA, 2021
Toluene	110	75	ARBCA, 2021	980	ARBCA, 2021
Ethylbenzene	120	55	ARBCA, 2021	640	ARBCA, 2021
Xylene	65	95	ARBCA, 2021	2600	ARBCA, 2021
Modified TPH (Gas)	210	210	ARBCA, 2021	11,000	ARBCA, 2021
Modified TPH (Fuel)	150	150	ARBCA, 2021	9800	ARBCA, 2021
Modified TPH (Lube)	1300	300	ARBCA, 2021	16,000	ARBCA, 2021
MTBE	31	25	MOECC, 2011	-	
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	0.75	0.6	MOECC, 2011	8.8	CCME
1 - Methylnaphthalene	-	-		-	
2 - Methylnaphthalene	-	-		-	
Acenaphthene	-	-		21.5	CCME
Acenaphthylene	-	-		-	
Anthracene	2.5	2.5	CCME	61.5	CCME
Fluoranthene	50	50	CCME	15.4	CCME
Fluorene	-	-		15.4	CCME
Phenanthrene	7.8	6.2	MOECC, 2011	43	CCME
Pyrene	-	-		7.7	CCME
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	-	-		-	
Benz[a]anthracene	0.63	0.5	MOECC, 2011	6.2	CCME
Benzo[a]pyrene	20	20	CCME	0.6	CCME

Land Use	Agricultural				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Benzo[b,j,k]fluoranthene isomers	9.5	7.6	MOECC, 2011	6.2	CCME
Benzo[g,h,i]perylene	8.3	6.6	MOECC, 2011	-	
Chrysene	8.8	7	MOECC, 2011	6.2	CCME
Dibenz[a,h]anthracene	-	-		-	
Indeno[1,2,3-c,d]pyrene	0.48	0.38	MOECC, 2011	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	-	-		-	
Bromoform	-	-		-	
Bromomethane	-	-		-	
Carbon Tetrachloride (Tetrachloromethane)	7.3	5.8	MOECC, 2011	7.6	MOECC, 2011
Chlorobenzene	7.5	6	MOECC, 2011	-	
Chloroethane	-	-		-	
Chloroform	43	34	MOECC, 2011	81	MOECC, 2011
Chloromethane	-	-		-	
Dibromochloromethane	-	-		-	
1,2-Dichlorobenzene	4.3	3.4	MOECC, 2011	-	
1,3-Dichlorobenzene	6	4.8	MOECC, 2011	-	
1,4-Dichlorobenzene	4.5	3.6	MOECC, 2011	-	
1,1-Dichloroethane	11	8.4	MOECC, 2011	-	
1,2-Dichloroethane	60	48	MOECC, 2011	29	MOECC, 2011
1,1-Dichloroethylene	63	50	MOECC, 2011	43	MOECC, 2011
cis-1,2-Dichloroethylene	-	-		84	MOECC, 2011
trans-1,2-Dichloroethylene	-	-		84	MOECC, 2011
1,2-Dichloropropane	31	25	MOECC, 2011	-	
1,3-Dichloropropene	31	25	MOECC, 2011	-	
Ethylene Dibromide	-	-		-	
Methylene Chloride (Dichloromethane)	0.98	0.78	MOECC, 2011	230	MOECC, 2011
Styrene	22	17	MOECC, 2011	-	
1,1,1,2-Tetrachloroethane	-	-		-	
1,1,2,2-Tetrachloroethane	-	-		-	
Tetrachloroethylene	15	15	BC MOECCS Schedule 3.1	4.5	MOECC, 2011
1,1,1-Trichloroethane	22	18	MOECC, 2011	820	MOECC, 2011
1,1,2-Trichloroethane	100	80	MOECC, 2011	-	
Trichloroethylene	3	3	CCME	8.1	MOECC, 2011
Vinyl Chloride	4.3	3.4	MOECC, 2011	6.8	MOECC, 2011
Pesticides					
Aldicarb	-	-		-	
Aldrin	0.055	0.044	MOECC, 2011	0.0024	MOECC, 2011
Atrazine	-	-		-	
Azinphos-methyl	-	-		-	
Bendiocarb	-	-		-	
Bromoxynil	-	-		-	
Carbaryl	-	-		-	
Carbofuran	-	-		-	
Chlorothalonil	-	-		-	
Chlorpyrifos	-	-		-	
Cyanazine	-	-		-	
2,4-D	-	-		-	
DDT	12	12	CCME	0.7	CCME
Diazinon	-	-		-	
Dicamba	-	-		-	
Dichlorfop-methyl	-	-		-	
Dieldrin	0.055	0.044	MOECC, 2011	0.00096	MOECC, 2011
Dimethoate	-	-		-	
Dinoseb	-	-		-	
Diquat	-	-		-	

Land Use	Agricultural				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Diuron	-	-		-	
Endosulfan	0.19	0.15	MOECC, 2011	0.023	MOECC, 2011
Endrin	0.024	0.019	MOECC, 2011	0.0011	MOECC, 2011
Glyphosate	-	-		-	
Heptachlor	0.25	0.2	MOECC, 2011	3.9	MOECC, 2011
Lindane	-	-		-	
Linuron	-	-		-	
Malathion	-	-		-	
MCPA	-	-		-	
Methoxychlor	-	-		0.13	MOECC, 2011
Metolachlor	-	-		-	
Metribuzin	-	-		-	
Paraquat	-	-		-	
Parathion	-	-		-	
Phorate	-	-		-	
Picloram	-	-		-	
Simazine	-	-		-	
Tebuthiuron	0.046	0.046	AEP, 2019	-	
Terbufos	-	-		-	
Toxaphene	-	-		-	
Triallate	-	-		-	
Trifluralin	-	-		-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	-	-		-	
Perfluorooctane sulfonate (PFOS)	11	11	ECCC, 2017	0.01	ECCC, 2017
Perfluorobutanoate (PFBA)	-	-		-	
Perfluorobutane sulfonate (PFBS)	-	-		-	
Perfluorohexanesulfonate (PFHxS)	-	-		-	
Perfluoropentanoate (PFPeA)	-	-		-	
Perfluorohexanoate (PFHxA)	-	-		-	
Perfluoroheptanoate (PFHpA)	-	-		-	
Perfluorononanoate (PFNA)	-	-		-	
Other Parameters					
Polychlorinated Biphenyls (Total PCB)	33	33	CCME	1.3	CCME
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.00001	0.00001	BC MOECCS Schedule 3.1	0.00025	CCME
Pentachlorophenol (PCP)	11	11	CCME	0.013	MOECC, 2011
Organotins - Tributyltin	-	-		-	
Ethylene Glycol	1100	1100	AEP, 2019	-	
Propylene Glycol	NGR	NGR	CCME	-	
Phenol	20	20	CCME	9.4	MOECC, 2011

Notes:

All values in mg/kg unless otherwise noted.

NGR=no guideline required. CCME applies the NGR designation to substances that were considered for ecological soil quality guideline derivation, but were deemed to not require such a guideline. This can be due to various reasons including substance physical-chemical, environmental fate and behaviour and toxicological properties, which may partially or collectively indicate a substance will not occur to any significant extent in soil and/or will not pose an ecological risk if it does occur in soil.

"-" indicates no ecological soil quality guideline was identified.

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Residential / Parkland Land Use (mg/kg)

Land Use	Residential / Parkland				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Inorganic Parameters					
Aluminum	-	-		-	
Antimony	20	20	AEP, 2019	25	MOECC, 2011
Arsenic	17.1	17.1	CCME	51	MOECC, 2011
Barium	500	500	AEP, 2019	390	MOECC, 2011
Beryllium	5	5	AEP, 2019	13	MOECC, 2011
Boron (Total)	-	-		120	MOECC, 2011
Boron (mg/L in saturated paste extract)	3.3	3.3	AEP, 2019	-	
Cadmium	10	10	CCME	1.9	MOECC, 2011
Chromium (hexavalent)	0.4	0.4	AEP, 2019	160	MOECC, 2011
Chromium (total)	64	64	CCME	910	MOECC, 2011
Cobalt	20	20	AEP, 2019	180	MOECC, 2011
Copper	63	63	CCME	770	MOECC, 2011
Cyanide	0.9	0.9	CCME	0.11	MOECC, 2011
Iron	-	-		-	
Lead	300	300	CCME	32	MOECC, 2011
Manganese	-	-		-	
Mercury (total)	12	12	CCME	20	MOECC, 2011
Molybdenum	4	4	AEP, 2019	6.9	MOECC, 2011
Nickel	45	45	CCME	5000	MOECC, 2011
Selenium	1	1	CCME	2.4	MOECC, 2011
Silver	20	20	AEP, 2019	-	
Strontium	-	-		-	
Thallium	1.4	1.4	CCME	3.9	MOECC, 2011
Tin	5	5	AEP, 2019	-	
Uranium	500	500	CCME	33	MOECC, 2011
Vanadium	130	130	CCME	18	MOECC, 2011
Zinc	250	250	CCME	340	MOECC, 2011
General Chemistry Parameters					
Chloride	350	350	BC MOECCS Schedule 3.1	-	
Sodium	200	200	BC MOECCS Schedule 3.1	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	60	31	ARBCA, 2021	370	MOECC, 2011
Toluene	110	75	ARBCA, 2021	90	MOECC, 2011
Ethylbenzene	120	55	ARBCA, 2021	140	MOECC, 2011
Xylene	65	95	ARBCA, 2021	96	MOECC, 2011
Modified TPH (Gas)	210	210	ARBCA, 2021	-	
Modified TPH (Fuel)	150	150	ARBCA, 2021	-	
Modified TPH (Lube)	1300	300	ARBCA, 2021	-	
MTBE	31	25	MOECC, 2011	-	
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	0.75	0.6	MOECC, 2011	8.8	CCME
1 - Methylnaphthalene	-	-		-	
2 - Methylnaphthalene	-	-		-	
Acenaphthene	-	-		21.5	CCME
Acenaphthylene	-	-		-	
Anthracene	2.5	2.5	CCME	61.5	CCME
Fluoranthene	50	50	CCME	15.4	CCME

Land Use	Residential / Parkland				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Fluorene	-	-		15.4	CCME
Phenanthrene	7.8	6.2	MOECC, 2011	43	CCME
Pyrene	-	-		7.7	CCME
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	-	-		-	
Benz[a]anthracene	0.63	0.5	MOECC, 2011	6.2	CCME
Benzo[a]pyrene	20	20	CCME	0.6	CCME
Benzo[b,j,k]fluoranthene isomers	9.5	7.6	MOECC, 2011	6.2	CCME
Benzo[g,h,i]perylene	8.3	6.6	MOECC, 2011	-	
Chrysene	8.8	7	MOECC, 2011	6.2	CCME
Dibenz[a,h]anthracene	-	-		-	
Indeno[1,2,3-c,d]pyrene	0.48	0.38	MOECC, 2011	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	-	-		-	
Bromoform	-	-		-	
Bromomethane	-	-		-	
Carbon Tetrachloride (Tetrachloromethane)	7.3	5.8	MOECC, 2011	7.6	MOECC, 2011
Chlorobenzene	7.5	6	MOECC, 2011	-	
Chloroethane	-	-		-	
Chloroform	43	34	MOECC, 2011	81	MOECC, 2011
Chloromethane	-	-		-	
Dibromochloromethane	-	-		-	
1,2-Dichlorobenzene	4.3	3.4	MOECC, 2011	-	
1,3-Dichlorobenzene	6	4.8	MOECC, 2011	-	
1,4-Dichlorobenzene	4.5	3.6	MOECC, 2011	-	
1,1-Dichloroethane	11	8.4	MOECC, 2011	-	
1,2-Dichloroethane	60	48	MOECC, 2011	29	MOECC, 2011
1,1-Dichloroethylene	63	50	MOECC, 2011	43	MOECC, 2011
cis-1,2-Dichloroethylene	-	-		84	MOECC, 2011
trans-1,2-Dichloroethylene	-	-		84	MOECC, 2011
1,2-Dichloropropane	31	25	MOECC, 2011	-	
1,3-Dichloropropene	31	25	MOECC, 2011	-	
Ethylene Dibromide	-	-		-	
Methylene Chloride (Dichloromethane)	0.98	0.78	MOECC, 2011	350	MOECC, 2011
Styrene	22	17	MOECC, 2011	-	
1,1,1,2-Tetrachloroethane	-	-		-	
1,1,2,2-Tetrachloroethane	-	-		-	
Tetrachloroethylene	15	15	BC MOECCS Schedule 3.1	4.5	MOECC, 2011
1,1,1-Trichloroethane	22	18	MOECC, 2011	820	MOECC, 2011
1,1,2-Trichloroethane	100	80	MOECC, 2011	-	
Trichloroethylene	3	3	AEP, 2019	8.1	MOECC, 2011
Vinyl Chloride	4.3	3.4	MOECC, 2011	12	MOECC, 2011
Pesticides					
Aldicarb	-	-		-	
Aldrin	0.055	0.044	MOECC, 2011	0.0024	MOECC, 2011
Atrazine	-	-		-	
Azinphos-methyl	-	-		-	
Bendiocarb	-	-		-	
Bromoxynil	-	-		-	
Carbaryl	-	-		-	

Land Use	Residential / Parkland				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Carbofuran	-	-		-	
Chlorothalonil	-	-		-	
Chlorpyrifos	-	-		-	
Cyanazine	-	-		-	
2,4-D	-	-		-	
DDT	12	12	CCME	0.7	CCME
Diazinon	-	-		-	
Dicamba	-	-		-	
Dichlorfop-methyl	-	-		-	
Dieldrin	0.055	0.044	MOECC, 2011	0.0024	MOECC, 2011
Dimethoate	-	-		-	
Dinoseb	-	-		-	
Diquat	-	-		-	
Diuron	-	-		-	
Endosulfan	0.19	0.15	MOECC, 2011	0.023	MOECC, 2011
Endrin	0.024	0.019	MOECC, 2011	0.0011	MOECC, 2011
Glyphosate	-	-		-	
Heptachlor	0.25	0.2	MOECC, 2011	3.9	MOECC, 2011
Lindane	-	-		-	
Linuron	-	-		-	
Malathion	-	-		-	
MCPA	-	-		-	
Methoxychlor	-	-		0.13	MOECC, 2011
Metolachlor	-	-		-	
Metribuzin	-	-		-	
Paraquat	-	-		-	
Parathion	-	-		-	
Phorate	-	-		-	
Picloram	-	-		-	
Simazine	-	-		-	
Tebuthiuron	0.046	0.046	AEP, 2019	-	
Terbufos	-	-		-	
Toxaphene	-	-		-	
Triallate	-	-		-	
Trifluralin	-	-		-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	-	-		-	
Perfluorooctane sulfonate (PFOS)	11	11	ECCC, 2017	0.01	ECCC, 2017
Perfluorobutanoate (PFBA)	-	-		-	
Perfluorobutane sulfonate (PFBS)	-	-		-	
Perfluorohexanesulfonate (PFHxS)	-	-		-	
Perfluoropentanoate (PFPeA)	-	-		-	
Perfluorohexanoate (PFHxA)	-	-		-	
Perfluoroheptanoate (PFHpA)	-	-		-	
Perfluorononanoate (PFNA)	-	-		-	
Other Parameters					
Polychlorinated Biphenyls (Total PCB)	33	33	CCME	1.3	CCME
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.001	0.001	BC MOECCS Schedule 3.1	0.000013	MOECC, 2011
Pentachlorophenol (PCP)	11	11	CCME	0.013	MOECC, 2011
Organotins - Tributyltin	-	-		-	

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Residential / Parkland Land Use (mg/kg)

Land Use	Residential / Parkland				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Ethylene Glycol	1100	1100	AEP, 2019	-	
Propylene Glycol	NGR	NGR	CCME	-	
Phenol	20	20	CCME	9.4	MOECC, 2011

Notes:

All values in mg/kg unless otherwise noted.

NGR=no guideline required. CCME applies the NGR designation to substances that were considered for ecological soil quality guideline derivation, but were deemed to not require such a guideline. This can be due to various reasons including substance physical-chemical, environmental fate and behaviour and toxicological properties, which may partially or collectively indicate a substance will not occur to any significant extent in soil and/or will not pose an ecological risk if it does occur in soil.

"-" indicates no ecological soil quality guideline was identified.

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial / Industrial Land Use (mg/kg)

Land Use	Commercial / Industrial				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Inorganic Parameters					
Aluminum	-	-		-	
Antimony	40	40	AEP, 2019	1500	MOECC, 2011
Arsenic	26	26	CCME	330	MOECC, 2011
Barium	2000	2000	AEP, 2019	670	MOECC, 2011
Beryllium	8	8	AEP, 2019	780	MOECC, 2011
Boron (Total)	-	-		120	MOECC, 2011
Boron (mg/L in saturated paste extract)	7.9	7.9	AEP, 2019	-	
Cadmium	22	22	CCME	1.9	MOECC, 2011
Chromium (hexavalent)	1.4	1.4	AEP, 2019	8500	MOECC, 2011
Chromium (total)	87	87	CCME	160	MOECC, 2011
Cobalt	300	300	AEP, 2019	180	MOECC, 2011
Copper	91	91	CCME	3100	MOECC, 2011
Cyanide	8	8	CCME	0.11	MOECC, 2011
Iron	-	-		-	
Lead	600	600	CCME	32	MOECC, 2011
Manganese	-	-		-	
Mercury (total)	50	50	CCME	20	MOECC, 2011
Molybdenum	40	40	AEP, 2019	74	MOECC, 2011
Nickel	89	89	CCME	5400	MOECC, 2011
Selenium	2.9	2.9	CCME	1200	MOECC, 2011
Silver	40	40	AEP, 2019	490	MOECC, 2011
Strontium	-	-		-	
Thallium	3.6	3.6	CCME	47	MOECC, 2011
Tin	300	300	AEP, 2019	-	
Uranium	2000	2000	CCME	33	MOECC, 2011
Vanadium	130	130	CCME	18	MOECC, 2011
Zinc	360	360	CCME	340	MOECC, 2011
General Chemistry Parameters					
Chloride	2500	2500	BC MOECCS Schedule 3.1	-	
Sodium	1000	1000	BC MOECCS Schedule 3.1	-	
Petroleum Hydrocarbons (PHC) Parameters					
Benzene	310	180	ARBCA, 2021	6800	MOECC, 2011
Toluene	330	250	ARBCA, 2021	14,000	MOECC, 2011
Ethylbenzene	430	300	ARBCA, 2021	38,000	MOECC, 2011
Xylene	230	350	ARBCA, 2021	47,000	MOECC, 2011
Modified TPH (Gas)	320	320	ARBCA, 2021	-	
Modified TPH (Fuel)	260	260	ARBCA, 2021	-	
Modified TPH (Lube)	2500	1700	ARBCA, 2021	-	
MTBE	63	50	MOECC, 2011	-	
Polycyclic Aromatic Hydrocarbons (PAH) Parameters					
Non-Carcinogenic PAH Compounds					
Naphthalene	28	22	MOECC, 2011	1300	MOECC, 2011
1 - Methylnaphthalene	-	-		-	
2 - Methylnaphthalene	-	-		-	
Acenaphthene	-	-		46,000	MOECC, 2011
Acenaphthylene	-	-		-	
Anthracene	32	32	CCME	47,000	MOECC, 2011
Fluoranthene	180	180	CCME	120,000	MOECC, 2011
Fluorene	-	-		-	
Phenanthrene	16	12	MOECC, 2011	36,000	MOECC, 2011
Pyrene	-	-		99,000	MOECC, 2011

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Soil - Commercial / Industrial Land Use (mg/kg)

Land Use	Commercial / Industrial				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Carcinogenic PAH Compounds					
BaP Total Potency Equivalents	-	-		-	
Benz[a]anthracene	1.3	1	MOECC, 2011	-	
Benzo[a]pyrene	72	72	CCME	46,000	MOECC, 2011
Benzo[b,j,k]fluoranthene isomers	19	15	MOECC, 2011	-	
Benzo[g,h,i]perylene	17	13	MOECC, 2011	-	
Chrysene	18	14	MOECC, 2011	-	
Dibenz[a,h]anthracene	-	-		-	
Indeno[1,2,3-c,d]pyrene	0.95	0.76	MOECC, 2011	-	
Volatile Organic Compound (VOC) Parameters					
Bromodichloromethane	-	-		-	
Bromoform	-	-		-	
Bromomethane	-	-		-	
Carbon Tetrachloride (Tetrachloromethane)	15	12	MOECC, 2011	880	MOECC, 2011
Chlorobenzene	15	12	MOECC, 2011	-	
Chloroethane	-	-		-	
Chloroform	85	68	MOECC, 2011	830	MOECC, 2011
Chloromethane	-	-		-	
Dibromochloromethane	-	-		-	
1,2-Dichlorobenzene	8.5	6.8	MOECC, 2011	-	
1,3-Dichlorobenzene	12	9.6	MOECC, 2011	-	
1,4-Dichlorobenzene	9	7.2	MOECC, 2011	-	
1,1-Dichloroethane	21	17	MOECC, 2011	-	
1,2-Dichloroethane	120	96	MOECC, 2011	29	MOECC, 2011
1,1-Dichloroethylene	130	100	MOECC, 2011	760	MOECC, 2011
cis-1,2-Dichloroethylene	-	-		940	MOECC, 2011
trans-1,2-Dichloroethylene	-	-		940	MOECC, 2011
1,2-Dichloropropane	63	50	MOECC, 2011	-	
1,3-Dichloropropene	63	50	MOECC, 2011	-	
Ethylene Dibromide	-	-		-	
Methylene Chloride (Dichloromethane)	2	1.6	MOECC, 2011	400	MOECC, 2011
Styrene	43	34	MOECC, 2011	-	
1,1,1,2-Tetrachloroethane	-	-		-	
1,1,2,2-Tetrachloroethane	-	-		-	
Tetrachloroethylene	30	30	BC MOECCS Schedule 3.1	310	MOECC, 2011
1,1,1-Trichloroethane	44	35	MOECC, 2011	39,000	MOECC, 2011
1,1,2-Trichloroethane	200	160	MOECC, 2011	-	
Trichloroethylene	50	50	CCME	390	MOECC, 2011
Vinyl Chloride	8.5	6.8	MOECC, 2011	12	MOECC, 2011
Pesticides					
Aldicarb	-	-		-	
Aldrin	0.11	0.088	MOECC, 2011	1200	MOECC, 2011
Atrazine	-	-		-	
Azinphos-methyl	-	-		-	
Bendiocarb	-	-		-	
Bromoxynil	-	-		-	
Carbaryl	-	-		-	
Carbofuran	-	-		-	
Chlorothalonil	-	-		-	
Chlorpyrifos	-	-		-	
Cyanazine	-	-		-	
2,4-D	-	-		-	
DDT	12	12	CCME	0.0012	MOECC, 2011
Diazinon	-	-		-	

Land Use	Commercial / Industrial				
Pathway	Soil Contact			Soil and Food Ingestion	
Parameter	Fine	Coarse	Reference	Fine/Coarse	Reference
Dicamba	-	-		-	
Dichlorfop-methyl	-	-		-	
Dieldrin	0.11	0.088	MOECC, 2011	240	MOECC, 2011
Dimethoate	-	-		-	
Dinoseb	-	-		-	
Diquat	-	-		-	
Diuron	-	-		-	
Endosulfan	0.38	0.3	MOECC, 2011	1.2	MOECC, 2011
Endrin	0.048	0.038	MOECC, 2011	0.0011	MOECC, 2011
Glyphosate	-	-		-	
Heptachlor	0.5	0.4	MOECC, 2011	1100	MOECC, 2011
Lindane	-	-		-	
Linuron	-	-		-	
Malathion	-	-		-	
MCPA	-	-		-	
Methoxychlor	-	-		4100	MOECC, 2011
Metolachlor	-	-		-	
Metribuzin	-	-		-	
Paraquat	-	-		-	
Parathion	-	-		-	
Phorate	-	-		-	
Picloram	-	-		-	
Simazine	-	-		-	
Tebuthiuron	0.60	0.60	AEP, 2019	-	
Terbufos	-	-		-	
Toxaphene	-	-		-	
Triallate	-	-		-	
Trifluralin	-	-		-	
PFAS Substances					
Perfluorooactanoic acid (PFOA)	-	-		-	
Perfluorooctane sulfonate (PFOS)	61	61	ECCC, 2017	-	
Perfluorobutanoate (PFBA)	-	-		-	
Perfluorobutane sulfonate (PFBS)	-	-		-	
Perfluorohexanesulfonate (PFHxS)	-	-		-	
Perfluoropentanoate (PFPeA)	-	-		-	
Perfluorohexanoate (PFHxA)	-	-		-	
Perfluoroheptanoate (PFHpA)	-	-		-	
Perfluorononanoate (PFNA)	-	-		-	
Other Parameters					
Polychlorinated Biphenyls (Total PCB)	33	33	CCME	1.1	MOECC, 2011
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.0025	0.0025	BC MOECCS Schedule 3.1	0.000099	MOECC, 2011
Pentachlorophenol (PCP)	28	28	CCME	2000	MOECC, 2011
Organotins - Tributyltin	-	-		-	
Ethylene Glycol	1800	1800	AEP, 2019	-	
Propylene Glycol	NGR	NGR	CCME	-	
Phenol	128	128	CCME	9.4	MOECC, 2011

Notes:

All values in mg/kg unless otherwise noted.

NGR=no guideline required. CCME applies the NGR designation to substances that were considered for ecological soil quality guideline derivation, but were deemed to not require such a guideline. This can be due to various reasons including substance physical-chemical, environmental fate and behaviour and toxicological properties, which may partially or collectively indicate a substance will not occur to any significant extent in soil and/or will not pose an ecological risk if it does occur in soil.

"-" indicates no ecological soil quality guideline was identified.

Atlantic RBCA - Ecological Tier II Pathway-Specific Standards (PSS) for Surface Water and Groundwater - Freshwater and Marine (µg/L)

Media		Surface Water (Including Groundwater < 10m from Surface Water Body)						Groundwater (> 10 metres from Surface Water Body)			
Pathway		Fresh Water			Marine Water			Fresh Water		Marine Water	
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference	Value	Comments	Value	Comments
Inorganic Parameters											
Aluminum	µg/L	5	5 ug/L at pH<6.5; 100 ug/L at pH ≥ 6.5	CCME; at pH <6.5	-			50		-	
Antimony	µg/L	9		BC CSR Schedule 3.2	250		BC CSR Schedule 3.2	90		2500	
Arsenic	µg/L	5.0		CCME	12.5		CCME	50		125	
Barium	µg/L	1000	this is a 30 day avg; BC also has 5000 ug/L as a max acceptable value	BC CSR Schedule 3.2	500	this is min risk level; BC also has 1000 ug/L as hazardous concentration	BC CSR Schedule 3.2	10,000		5000	
Beryllium	µg/L	0.15		BC CSR Schedule 3.2	100	this is min risk level; BC also has 1500 ug/L as hazardous concentration	BC CSR Schedule 3.2	1.5		1000	
Boron	µg/L	1500		CCME	1200		BCMOECCS, 2019 - Approved	15,000		12,000	
Cadmium	µg/L	0.09	10{0.86[log(hardness)]-3.2} ;Cadmium guideline value ranges from 0.01 ug/L at hardness of 25 mg/L CaCO3 to 0.055 ug/L at hardness of 180 mg/L CaCO3	CCME	0.12		CCME	0.9		1.2	
Chromium (hexavalent)	µg/L	1.0		CCME	1.5		CCME	10		15	
Chromium (total)	µg/L	8.9		CCME	56		CCME	89		560	
Cobalt	µg/L	1	The freshwater guideline assumes a hardness of 100 mg/L. There is an equation: FWQG = exp{(0.414[ln(hardness)] – 1.887}, for other hardness values between 52-396 mg/L.	FEQG	4	30-d average; max value of 110 ug/L.	BCMOECCS, 2019 - Approved	10		40	
Copper	µg/L	2.0	The CWQG for copper is related to water hardness (as CaCO3): When the water hardness is 0 to < 82 mg/L, the CWQG is 2 µg/L At hardness ≥82 to ≤180 mg/L the CWQG is calculated using this equation (see calculator below) CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465} At hardness >180 mg/L, the CWQG is 4 µg/L If the hardness is unknown, the CWQG is 2 µg/L	CCME	2	this is a 30 d avg; BC also has a max acceptable value of 3 ug/L	BCMOECCS, 2019 - Approved	20		20	
Cyanide	µg/L	5		CCME	1	max; weak-acid dissociable CN	BCMOECCS, 2019 - Approved	50		10	
Iron	µg/L	300		CCME	-			3000		-	
Lead	µg/L	1	Lead guideline: 1 ug/L at a water hardness of 0-60 mg/L (soft) as CaCO3; 2 ug/L at a water hardness of 60-120 mg/L (medium) as CaCO3; 4 ug/L at a water hardness of 120-180 mg/L (hard) as CaCO3; 7 ug/L at a water hardness of >180 mg/L (very hard) as CaCO3	CCME	2	this is a 30 day avg; BC also has a max value of 140 ug/L	BCMOECCS, 2019 - Approved	10	10 X Surface Fresh Water value	20	10 X Surface Marine Water value
Manganese	µg/L	430	Guideline value is based on hardness of 50 mg/L and pH of 7.5. Guideline values that correspond to other hardness and pH values are in Table 5 of the CCME Factsheet. The tabulated guideline values are valid between a hardness range of 25 to 670 mg/L and a pH range of 5.8 to 8.4.	CCME	-			4300		-	
Mercury (total)	µg/L	0.026		CCME	0.016		CCME	0.26		0.16	
Methylmercury	µg/L	0.004		CCME	0.004	adopted the FW WQG as a marine WQG in the absence of a marine WQG	CCME	0.04		0.04	
Molybdenum	µg/L	73		CCME	1000		BC CSR Schedule 3.2	730		10,000	
Nickel	µg/L	25	Nickel guideline: 25 ug/L at a water hardness of 0-60 mg/L (soft) as CaCO3; 65 ug/L at a water hardness of 60-120 mg/L (medium) as CaCO3; 110 ug/L at a water hardness of 120-180 mg/L (hard) as CaCO3; 150 ug/L at a water hardness of >180 mg/L (very hard) as CaCO3	CCME	8.3	this is a 4 day avg; BC also has a 1 hour avg of 75 ug/L	BC CSR Schedule 3.2	250		83	
Selenium	µg/L	1.0		CCME	2		BCMOECCS, 2019 - Approved	10		20	
Silver	µg/L	0.25		CCME	1.5	this is a 30 day avg; BC also has max acceptable value of 3 ug/L	BCMOECCS, 2019 - Approved	2.5		15	
Strontium	µg/L	21,000	final chronic value	MDEQ, 2008	-			210,000		-	
Thallium	µg/L	0.8		CCME	0.3		BC CSR Schedule 3.2	8		3	
Tin	µg/L	-			-			-		-	
Uranium	µg/L	15		CCME	8.5	this is a min risk level; BC also has 500 ug/L as the hazardous concentration	BC CSR Schedule 3.2	150		85	
Vanadium	µg/L	120		FEQG	5	trigger value for 99% level of protection	FEQG	1200		50	
Zinc	µg/L	7		CCME	10		BCMOECCS, 2019 - Approved	70		100	
General Chemistry Parameters											
Ammonia	µg/L	pH and temperature dependent; consult CCME fact sheet.	unionized Ammonia guideline (fresh water): See CCME (2000) for guideline values as a function of pH and temperature.	CCME	pH, salinity and temperature dependent; consult BCMOE schedule.	this is a 5-30 day avg; BC also has a max value of 14,000 ug/L; Ammonia guideline (sea water): Both maximum and 5-30 d average guidelines are expessed as total ammonia N, assuming salinity of 30 g/kg, temperature of 5 degrees C, and pH of 8.2 ; (all of which are typical sea water values); see BCMOE, 2001 for tables for total ammonia-N as a function of salinity, temperature and pH. To convert from unionized ammonia to ammonia-N, multiply by 0.8 (CCME, 2000).	BC CSR Schedule 3.2	pH and temperature dependent; consult CCME fact sheet.	10 X Surface Fresh Water value	pH, salinity and temperature dependent; consult BCMOE schedule.	10 X Surface Marine Water value
Chloride	µg/L	120,000	based on salinity as NaCl	CCME	No more than a 10% change in ambient sea water salinity (as NaCl).		BCMOECCS, 2019 - Approved	1,200,000	10 X Surface Fresh Water value	No more than a 10% change in ambient sea water salinity (as NaCl).	
Colour	TCU	**True Colour:** Mean absorbance of filtered samples at 456 nm shall not be significantly higher than seasonally adjusted expected value for system under consideration. **Apparent Colour:** Mean percent transmission of white light per metre shall not be significantly less than seasonally adjusted value for system under consideration (CCME, 2001).						**True Colour:** Mean absorbance of filtered samples at 456 nm shall not be significantly higher than seasonally adjusted expected value for system under consideration. **Apparent Colour:** Mean percent transmission of white light per metre shall not be significantly less than seasonally adjusted value for system under consideration (CCME, 2001).			

Media		Surface Water (Including Groundwater < 10m from Surface Water Body)						Groundwater (> 10 metres from Surface Water Body)			
Pathway		Fresh Water			Marine Water			Fresh Water		Marine Water	
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference	Value	Comments	Value	Comments
Fluoride	µg/L	120		CCME	1500	max value	BCMOECCS, 2019 - Approved	1200		15,000	
Hydrogen Sulphide	µg/L	2		OMOE, 1999	-			20		-	
Nitrate (as N)	µg/L	13,000	this benchmark does not protect against potential eutrophication; equivalent to 2900 ug nitrate-N/L	CCME	200,000	this benchmark does not protect against potential eutrophication; equivalent to 3600 ug nitrate-N/L	CCME	130,000		2,000,000	
Nitrate + Nitrite (as N)	µg/L	-			-			-	10 X Surface Fresh Water value	-	10 X Surface Marine Water value
Nitrite (as N)	µg/L	60		CCME	-			600		-	
pH	Units	6.5 to 9		CCME	7.0 to 8.7		CCME	#VALUE!		-	
Sodium	µg/L	-			-			-		-	
Sulphate	µg/L	128,000	max acceptable value	BCMOECCS, 2019 - Approved	-			1,280,000		-	
Total Dissolved Solids (TDS)	µg/L	-			-			-		-	
Petroleum Hydrocarbons (PHC) Parameters											
Benzene	µg/L	2100	Eco-screening Protocol, ARBCA	ARBCA, 2021	2100	Eco-screening Protocol, ARBCA	ARBCA, 2021	4600	Eco-screening Protocol, ARBCA	4600	Eco-screening Protocol, ARBCA
Toluene	µg/L	770	Eco-screening Protocol, ARBCA	ARBCA, 2021	770	Eco-screening Protocol, ARBCA	ARBCA, 2021	4200	Eco-screening Protocol, ARBCA	4200	Eco-screening Protocol, ARBCA
Ethylbenzene	µg/L	320	Eco-screening Protocol, ARBCA	ARBCA, 2021	320	Eco-screening Protocol, ARBCA	ARBCA, 2021	3200	Eco-screening Protocol, ARBCA	3200	Eco-screening Protocol, ARBCA
Xylene	µg/L	330	Eco-screening Protocol, ARBCA	ARBCA, 2021	330	Eco-screening Protocol, ARBCA	ARBCA, 2021	2800	Eco-screening Protocol, ARBCA	2800	Eco-screening Protocol, ARBCA
Modified TPH (Gas)	µg/L	1500	Eco-screening Protocol, ARBCA	ARBCA, 2021	1500	Eco-screening Protocol, ARBCA	ARBCA, 2021	13,000	Eco-screening Protocol, ARBCA	13,000	Eco-screening Protocol, ARBCA
Modified TPH (Fuel)	µg/L	100	Eco-screening Protocol, ARBCA	ARBCA, 2021	100	Eco-screening Protocol, ARBCA	ARBCA, 2021	840	Eco-screening Protocol, ARBCA	840	Eco-screening Protocol, ARBCA
Modified TPH (Lube)	µg/L	100	Eco-screening Protocol, ARBCA	ARBCA, 2021	100	Eco-screening Protocol, ARBCA	ARBCA, 2021	480	Eco-screening Protocol, ARBCA	480	Eco-screening Protocol, ARBCA
MTBE	µg/L	10,000		CCME	5000		CCME	100,000	10 X Surface Fresh Water value	50,000	10 X Surface Marine Water value
Polycyclic Aromatic Hydrocarbons (PAH) Parameters											
Non-Carcinogenic PAH Compounds											
Naphthalene	µg/L	1.1		CCME	1.4		CCME	11		14	
1 - Methylnaphthalene	µg/L	2	Interim PWQO	OMOE, 1999	1		BCMOECCS, 2019 - Approved	20		10	
2 - Methylnaphthalene	µg/L	2	Interim PWQO	OMOE, 1999	1		BCMOECCS, 2019 - Approved	20		10	
Acenaphthene	µg/L	5.8		CCME	6		BCMOECCS, 2019 - Approved	58		60	
Acenaphthylene	µg/L	-			-			-		-	
Anthracene	µg/L	0.012		CCME	0.1		BC CSR Schedule 3.2	0.12	10 X Surface Fresh Water value	1	10 X Surface Marine Water value
Fluoranthene	µg/L	0.04		CCME	0.2		BC CSR Schedule 3.2	0.4		2	
Fluorene	µg/L	3		CCME	12		BCMOECCS, 2019 - Approved	30		120	
Phenanthrene	µg/L	0.4		CCME	0.3		BC CSR Schedule 3.2	4		3	
Pyrene	µg/L	0.025		CCME	0.02		BC CSR Schedule 3.2	0.25		0.2	
Carcinogenic PAH Compounds											
BaP Total Potency Equivalents	µg/L	-			-			-		-	
Benz[a]anthracene	µg/L	0.018		CCME	-			0.18		-	
Benzo[a]pyrene	µg/L	0.015		CCME	0.01		BCMOECCS, 2019 - Approved	0.15		0.1	
Benzo[b,j,k]fluoranthene isomers	µg/L	-			-			-	10 X Surface Fresh Water value	-	10 X Surface Marine Water value
Benzo[g,h,i]perylene	µg/L	-			-			-		-	
Chrysene	µg/L	0.1		BC CSR Schedule 3.2	0.1		BCMOECCS, 2019 - Approved	1		1	
Dibenz[a,h]anthracene	µg/L	-			-			-		-	
Indeno[1,2,3-c,d]pyrene	µg/L	-			-			-		-	
Volatile Organic Compound (VOC) Parameters											
Bromodichloromethane	µg/L	200	Interim PWQO	OMOE, 1999	6400	marine chronic criteria; applies to sum of all halomethanes	New Hampshire DES, 2016	2000		64,000	
Bromoform	µg/L	60	Interim PWQO	OMOE, 1999	6400	marine chronic criteria; applies to sum of all halomethanes	New Hampshire DES, 2016	600		64,000	
Bromomethane	µg/L	0.9	Interim PWQO	OMOE, 1999	6400	marine chronic criteria; applies to sum of all halomethanes	New Hampshire DES, 2016	9		64,000	
Carbon Tetrachloride (Tetrachloromethane)	µg/L	13.3		CCME	13		BC CSR Schedule 3.2	133		130	
Chlorobenzene	µg/L	1.3		CCME	25		CCME	13		250	
Chloroethane	µg/L	1100		MDEQ, 2008	-			11,000		-	
Chloroform	µg/L	1.8		CCME	2		BC CSR Schedule 3.2	18		20	
Chloromethane	µg/L	700		OMOE, 1999	6400	marine chronic criteria; applies to sum of all halomethanes	New Hampshire DES, 2016	7000		64,000	
Dibromochloromethane	µg/L	40	Interim PWQO	OMOE, 1999	6400	marine chronic criteria; applies to sum of all halomethanes	New Hampshire DES, 2016	400		64,000	
1,2-Dichlorobenzene	µg/L	0.7		CCME	42		CCME	7		420	
1,3-Dichlorobenzene	µg/L	150		CCME	150		BC CSR Schedule 3.2	1500		1500	
1,4-Dichlorobenzene	µg/L	26		CCME	26		BC CSR Schedule 3.2	260	10 X Surface Fresh Water value	260	10 X Surface Marine Water value
1,1-Dichloroethane	µg/L	200	Interim PWQO	OMOE, 1999	-			2000		-	
1,2-Dichloroethane	µg/L	100		CCME	100		BC CSR Schedule 3.2	1000		1000	
1,1-Dichloroethylene	µg/L	40	Interim PWQO	OMOE, 1999	-			400		-	
cis-1,2-Dichloroethylene	µg/L	200	Interim PWQO	OMOE, 1999	-			2000		-	
trans-1,2-Dichloroethylene	µg/L	200	Interim PWQO	OMOE, 1999	-			2000		-	
1,2-Dichloropropane	µg/L	0.7	Interim PWQO	OMOE, 1999	3040	marine chronic criteria	New Hampshire DES, 2016	7		30,400	
1,3-Dichloropropene	µg/L	7	assumed same toxicity as the trans isomer	OMOE, 1999	-			70		-	
Ethylene Dibromide	µg/L	5	Interim PWQO	OMOE, 1999	-			50		-	
Methylene Chloride (Dichloromethane)	µg/L	98.1		CCME	98		BC CSR Schedule 3.2	981		980	
Styrene	µg/L	72		CCME	-			720		-	
1,1,1,2-Tetrachloroethane	µg/L	20	Interim PWQO	OMOE, 1999	-			200		-	
1,1,2,2-Tetrachloroethane	µg/L	70	Interim PWQO	OMOE, 1999	-			700		-	
Tetrachloroethylene	µg/L	110		CCME	110	marine chronic criteria	BC CSR Schedule 3.2	1100		1100	
1,1,1-Trichloroethane	µg/L	10	Interim PWQO	OMOE, 1999	-			100		-	
1,1,2-Trichloroethane	µg/L	800	Interim PWQO	OMOE, 1999	-			8000		-	
Trichloroethylene	µg/L	21		CCME	20		BC CSR Schedule 3.2	210		200	
Vinyl Chloride	µg/L	600	Interim PWQO	OMOE, 1999	-			6000		-	

Media		Surface Water (Including Groundwater < 10m from Surface Water Body)						Groundwater (> 10 metres from Surface Water Body)			
Pathway		Fresh Water			Marine Water			Fresh Water		Marine Water	
Parameter	Units	Value	Comments	Reference	Value	Comments	Reference	Value	Comments	Value	Comments
Pesticides											
Aldicarb	µg/L	1		CCME	0.15		CCME	10		1.5	
Aldrin	µg/L	See Dieldrin, PWQO is for sum of aldrin + dieldrin	applies to sum of concentrations of aldrin+dieldrin isomers in water	OMOE, 1999	-			See Dieldrin, PWQO is for sum of aldrin + dieldrin		-	
Atrazine	µg/L	1.8		CCME	-		CCME	18		-	
Azinphos-methyl	µg/L	0.01		AEP, 2018	0.01		Quebec MDEQ	0.1		0.1	
Bendiocarb	µg/L	-			-			-		-	
Bromoxynil	µg/L	5		CCME	-			50		-	
Carbaryl	µg/L	0.2		CCME	0.29		CCME	2		2.9	
Carbofuran	µg/L	1.8		CCME	-			18		-	
Chlorothalonil	µg/L	0.18		CCME	0.36		CCME	1.8		3.6	
Chlorpyrifos	µg/L	0.002		CCME	0.002		CCME	0.02		0.02	
Cyanazine	µg/L	2		CCME	-			20		-	
2,4-D	µg/L	4	max ester formulation	BC CSR Schedule 3.2	4		BC CSR Schedule 3.2	40		40	
DDT*	µg/L	0.001	applies to sum of DDT, DDD and DDE concentrations in water	BC CSR Schedule 3.2	0.001	applies to sum of DDT, DDD and DDE concentrations in water	BC CSR Schedule 3.2	0.01		0.01	
Diazinon	µg/L	0.003		BC CSR Schedule 3.2	0.82		New Hampshire DES, 2016	0.03		8.2	
Dicamba	µg/L	10		CCME	-			100		-	
Dichlorfop-methyl	µg/L	6.1		CCME	-			61		-	
Dieldrin*	µg/L	0.001	applies to sum of concentrations of aldrin+dieldrin isomers in water	OMOE, 1999	0.0019	this is a chronic criterion; the acute criterion is 0.71 ug/L	New Hampshire DES, 2016	0.01		0.019	
Dimethoate	µg/L	6.2		CCME	-			62		-	
Dinoseb	µg/L	0.05		CCME	-			0.5		-	
Diquat	µg/L	0.5		OMOE, 1999	-			5	10 X Surface Fresh Water value	-	10 X Surface Marine Water value
Diuron	µg/L	1.6		OMOE, 1999	-			16		-	
Endosulfan	µg/L	0.003		CCME	0.002		CCME	0.03		0.02	
Endrin*	µg/L	0.002		MOE, 1999	0.0023	this is a chronic criterion; the acute criterion is 0.037 ug/L	New Hampshire DES, 2016	0.02		0.023	
Glyphosate	µg/L	800		CCME	-			8000		-	
Heptachlor*	µg/L	0.001		OMOE, 1999	0.0036	this is a chronic criterion; the acute criterion is 0.053 ug/L	New Hampshire DES, 2016	0.01		0.036	
Lindane	µg/L	0.01		CCME	-			0.1		-	
Linuron	µg/L	7		CCME	-			70		-	
Malathion	µg/L	0.1		BC CSR Schedule 3.2	0.1		BC CSR Schedule 3.2	1		1	
MCPA	µg/L	2.6		CCME	4.2		CCME	26		42	
Methoxychlor	µg/L	0.03		AEP, 2018	-			0.3		-	
Metolachlor	µg/L	7.8		CCME	-			78		-	
Metribuzin	µg/L	1		CCME	-			10		-	
Paraquat	µg/L	16	Chronic Criterion	MDEQ, 1996	-			160		-	
Parathion	µg/L	0.008		OMOE, 1999	-			0.08		-	
Phorate	µg/L	-			-			-		-	
Picloram	µg/L	29		CCME	-			290		-	
Simazine	µg/L	10		CCME	-			100		-	
Tebuthiuron	µg/L	1.6		CCME	-			16		-	
Terbufos	µg/L	-			-			-		-	
Toxaphene*	µg/L	0.008		OMOE, 1999	0.0002	this is a chronic criterion; the acute criterion is 0.21 ug/L	New Hampshire DES, 2016	0.08		0.002	
Triallate	µg/L	0.24		CCME	-			2.4		-	
Trifluralin	µg/L	0.2		CCME	-			2		-	
PFAS Substances											
Perfluorooctane sulfonate (PFOS)	µg/L	6.8		FEQG	-			68		-	
Perfluorooctanoic acid (PFOA)	µg/L	-			-			-		-	
Perfluorobutanoate (PFBA)	µg/L	-			-			-		-	
Perfluorobutanesulfonate (PFBS)	µg/L	-			-			-		-	
Perfluorohexanesulfonate (PFHxS)	µg/L	-			-			-	10 X Surface Fresh Water value	-	10 X Surface Marine Water value
Perfluoropentanoate (PFPeA)	µg/L	-			-			-		-	
Perfluorohexanoate (PFHxA)	µg/L	-			-			-		-	
Perfluoroheptanoate (PFHpA)	µg/L	-			-			-		-	
Perfluorononanoate (PFNA)	µg/L	-			-			-		-	
Other Parameters											
Polychlorinated Biphenyls (Total PCB)	µg/L	0.001	PCBs do not partition to water to any signifcant extent	OMOE, 1999	-	PCBs do not partition to water to any signifcant extent		0.01	PCBs do not partition to water to any signifcant extent	-	PCBs do not partition to water to any signifcant extent
Dioxins and Furans (TEQ)	µg/L	-	Dioxins/furans do not partition to water to any significant extent		-	Dioxins/furans do not partition to water to any significant extent		-	Dioxins/furans do not partition to water to any significant extent	-	Dioxins/furans do not partition to water to any significant extent
Pentachlorophenol (PCP)	µg/L	0.5		CCME	7.9	chronic criterion	U.S. EPA, 2017	5		79	
Organotins - Tributyltin	µg/L	0.008		CCME	0.001		CCME	0.08		0.01	
Ethylene Glycol	µg/L	192,000		CCME	192,000		BC CSR Schedule 3.2	1,920,000	10 X Surface Fresh Water value	1,920,000	10 X Surface Marine Water value
Propylene Glycol	µg/L	500,000		CCME	500,000		BC CSR Schedule 3.2	5,000,000		5,000,000	
Phenol	µg/L	4		CCME	200		BC CSR Schedule 3.2	40		2000	

Notes:
All values in µg/L unless otherwise noted.
"-" indicates no guideline available.

The Atlantic PIRI benchmarks for BTEX and TPH (gasoline, diesel, #6 oil) are based on the Target Lipid Narcosis Model (TLNM), as these substances have a general narcotic mode of action. Because of this, it can be assumed that benchmarks for freshwater organisms are protective of marine organisms. This assumption is based on the similar sensitivity of freshwater and marine organisms to narcotic chemicals. Thus, most benchmarks derived on the basis of the TLNM are protective of both freshwater and marine organisms. For chemicals with more specific modes of action, freshwater and marine organisms can not be assumed to be similar in sensitivity, and separate freshwater and marine benchmarks should be applied or derived (if sufficient data exists).

* Indicates the benchmark value is below currently achievable analytical RDLs. For sites with potential surface water or groundwater contamination in relation to this substance, additional aquatic assessment and/or consultation with provincial regulators should occur to confirm this substance is not likely to be present at levels that could adversely affect aquatic biota.