



Port Hope Area Initiative Waste Management Project Environmental Protection Report for 2024

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Revision 0

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Annual Compliance Monitoring Report

Port Hope Area Initiative Waste Management Project

Environmental Report for 2024

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Information Use

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EXECUTIVE SUMMARY

This Environmental Protection Annual Compliance Monitoring Report for the 2024 calendar year is produced to summarize the results of the Port Hope Area Initiative (PHAI) Waste Management Project Environmental Protection Program. Canadian Nuclear Laboratories (CNL) reports on the Environmental Protection Program annually to the Canadian Nuclear Safety Commission as a condition of the *Port Hope Area Initiative Waste Management Project Licence WNSL-W1-2310.00/2032* and the *Port Hope Area Initiative Radioactive Waste Management Project Licence Conditions Handbook*. This report has been prepared in accordance with Licence Condition 3.1 of the *Port Hope Area Initiative Radioactive Waste Management Project Licence Conditions Handbook* and Canadian Nuclear Safety Commission Regulatory Document (REGDOC) 3.1.3, *Reporting Requirements for Waste Nuclear Substance Licensees, Class II Nuclear Facilities and Users of Prescribed Equipment, Nuclear Substances and Radiation Devices*. This report provides environmental specific information to supplement information in the *Port Hope Area Initiative Annual Compliance Monitoring Report for 2024*, which provides programmatic updates and performance of the 14 Safety and Control Areas and the Public Information Program.

The CNL Historic Waste Program Management Office and the Port Hope Area Initiative projects are situated on the traditional lands of the Williams Treaties First Nations, specifically the Gunshot Treaty negotiated between the Crown and Mississauga Nation during the 1780s and represented today by the Williams Treaties First Nations.

The Mississauga Nations are also signatories to various 18th and 19th century treaties that covered lands in different parts of south-central Ontario. In 1923, the Mississauga First Nations and the Chippewa First Nations consisting of Rama, Beausoleil, and Georgina Island signed the Williams Treaties and together, over 90 years later in 2018 June, joined to ensure that their rights and the relationship with these lands are respected through a renewed agreement with Canada and the Province of Ontario.

The area in which we are situated is also home to Indigenous Peoples from across the region and Canada. Canadian Nuclear Laboratories is grateful to have the opportunity to work on these traditionally and culturally significant lands and waterways.

Overall Performance Highlights

Canadian Nuclear Laboratories has a well-established environmental and biophysical protection program that monitors radiological and hazardous substances to minimize risk to the environment, CNL employees, and members of the public. Environmental protection and mitigation continue to be effective; changes from the baseline are minimal and generally within the environmental assessment predictions. Operational monitoring and environmental assessment follow-up activities continued during the reporting period, 2024 January 01 to 2024 December 31.

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Introduction

The Port Hope Area Initiative (PHAI) represents the federal government's response to the community-requested solution for the cleanup and local, long-term, safe management of historic low-level radioactive waste (LLRW) in the municipalities of Port Hope and Clarington, Ontario. The waste is the result of the refining practices of the former Crown corporation, Eldorado Nuclear Ltd., and its private sector predecessors. The original Eldorado refining operation and plant were established in the 1930s without consultation with Indigenous Peoples of the area.

An Agreement for the Cleanup and Long-Term Safe Management of -Low-level Radioactive Waste Situated in The Town of Port Hope, The Township of Hope and the Municipality of Clarington the (Legal Agreement) [1], finalized in 2001 March between the Government of Canada and the two municipalities, launched the PHAI by defining the framework and setting out the responsibilities for the Port Hope Project (PHP) and the Port Granby Project (PGP). The Legal Agreement [1] is periodically amended as needed to support changing circumstances.

Information included in this report is for the period of 2024 January 01 to 2024 December 31. The purpose of this report is to provide additional detail specific to the environmental protection Safety and Control Area in order to demonstrate that CNL is meeting the monitoring requirements as specified in the *Port Hope Area Initiative Waste Management Project Licence WNSL-W1-2310.00/2032* [3] and the *Port Hope Area Initiative Radioactive Waste Management Project Licence Conditions Handbook* [4]. This report provides information to supplement the information provided in the *Port Hope Area Initiative Waste Management Project Compliance Annual Monitoring Report* [2], which provides corporate updates to the 14 applicable Safety and Control Areas.

Facilities Included in this Report

The following facilities are included in this report:

- The Port Granby Long-Term Waste Management Facility (PG LTWMF).
- The Port Hope Long-Term Waste Management Facility (PH LTWMF).

1 Environmental Protection Program

The environmental protection Safety and Control Area covers programs that monitor and control all releases of nuclear and hazardous substances into the environment, as well as their effects on the environment as a result of licensed activities.

The release of hazardous substances is regulated by the Canadian Nuclear Safety Commission (CNSC), Fisheries and Oceans Canada, Environment and Climate Change Canada, and the Ministry of Environment, Conservation and Parks (MECP) through various acts and regulations.

The PHAI's Environmental Protection Program aligns with CNSC Regulatory Document (REGDOC) 2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* [5].

The PHAI adheres to CNL's Environmental Protection Functional Support Area. Refer to Section 9 of the *Port Hope Area Initiative Waste Management Project Annual Monitoring Report* [2] for details. The following documents define the methods and protocols followed in performing the environmental monitoring specific to the PHAI:

- *Port Granby Project, Environmental and Biophysical Monitoring Plan* [6].
- *Port Hope Project, Environmental Protection Plan* [7].
- *Port Hope Project, Environmental and Biophysical Monitoring Plan* [8].
- *Port Hope Project, Dust Management and Requirements Plan* [9].

The four signature contaminants of potential concern (COPCs) that are indicative of historic LLRW are arsenic, uranium, radium-226, and thorium-230. Additional primary COPCs include thorium-232, antimony, cobalt, copper, nickel, and lead. Secondary COPCs include barium, beryllium, boron, cadmium, mercury, molybdenum, selenium, silver, vanadium, and zinc. Not all parameters are analyzed at each site. The list of parameters sampled is based on the composition of the waste deposited and the historical conditions present at each site.

1.1 Environmental Compliance Monitoring

Small concentrations of hazardous substances are released to the environment as a result of the water treatment operations at the Port Hope Waste Water Treatment Plant (PH WWTP) and Port Granby Waste Water Treatment Plant (PG WWTP).

The PG and PH WWTPs were designed to meet the ongoing treatment requirements for the contaminants of potential concern associated with each site's LTWMF. Liquid effluent from the PG WWTP and PH WWTP is monitored to verify compliance with the limits for the contaminants, defined in the *Port Granby Project Environmental and Biophysical Monitoring Plan* [6] and the *Port Hope Project Environmental and Biophysical Monitoring Plan* [8] respectively. Monitored parameters must not exceed the specified release limits. In addition, CNL has established and CNSC has accepted action levels for the monitored parameters. An action level is intended to provide early warning of a potential loss of control of part of a

licensee's environmental protection program and triggers a requirement for specific action to be taken. Action levels are facility-specific parameters that are typically set near the upper bounds of normal operating performance and below regulatory limits. Exceeding an action level is not a regulatory non-compliance and does not necessarily imply a negative outcome; however, action level exceedances are CNSC reportable events.

Action levels are periodically reviewed following CSA Group Standard N288.8-17 [10] and adjusted so that they remain an effective indicator of the system performance. During the reporting period, no routine reviews of the action levels were completed. Action levels were previously reviewed and adjusted in 2023.

1.1.1 Monitoring Points, Schedules, and Parameters

Composite samples are collected weekly at both the PG WWTP and PH WWTP to collect data on the final effluent discharge. The sampling point at each plant is located at the final effluent tank. An auto-sampler collects a sample aliquot at a minimum frequency of every 15 minutes.

The samples are submitted to a third-party commercial laboratory certified to determine concentrations of the parameters listed in Table 1.

Due to the unique characterization of influent at each site, parameters differ between the two WWTPs.

Table 1: Waste Water Treatment Plant Effluent Monitoring Parameters

PH WWTP Parameters	PG WWTP Parameters
Total Aluminum (Al)	Total Arsenic (As)
Total Arsenic (As)	Total Cadmium (Cd)
Total Cadmium (Cd)	Total Cobalt (Co)
Total Cobalt (Co)	Total Copper (Cu)
Total Copper (Cu)	Total Molybdenum (Mo)
Total Lead (Pb)	Total Phosphorus (P)
Total Phosphorus (P)	Total Selenium (Se)
Total Uranium (U)	Total Thallium (Tl)
Total Vanadium (V)	Total Uranium (U)
Total Zinc (Zn)	Total Vanadium (V)
Radium-226 (Ra-226)	Radium-226 (Ra-226)
pH	pH
Total Suspended Solids (TSS)	Total Suspended Solids (TSS)
Acute Toxicity	Total Ammonia (NH ₃)
-	Nitrite (NO ₂)
-	Nitrate (NO ₃)
-	Acute Toxicity

Additionally, effluent cannot be acutely toxic as determined by monthly testing [4]. Toxicity sampling is taken from the same composite sample as the chemical parameters for analysis.

Results are compared to action levels and release limits defined in the Port Hope and Port Granby Environmental and Biophysical Monitoring Plans [6] [8].

1.1.1 Monitoring and Testing Methods

All compliance samples were submitted to a third-party commercial laboratory for analysis. The laboratory is certified by the Canadian Association for Laboratory Accreditation Inc. and follows ISO 17025:2017 requirements. Testing methods for regulated parameters are the following except for toxicity:

- Total metals and low level metals by ICPMS use analytical method EPA 6020B m and EPA 6020b R2 m

- Total Ammonia use analytical method USGS I-2522-90 m
- Nitrate and Nitrite in water use Standard Methods SM 24 4500-NO3I/NO2B
- pH in water uses Standard Methods SM 24th-4500H+B
- Radium-226 use method BQL SOP -00006 Alpha Spectrometry
- Total Suspended Solids use Standard Methods SM 24 2540D m

Toxicity samples were sent to two commercial laboratories for toxicity analysis. These laboratories use Environment and Climate Change Canada approved reference methods, namely:

- *Reference Method for Determining Acute Lethality of Effluents to Daphnia magna, Environment Canada EPS 1/RM/14 (Second Edition, 2000 December, with 2016 February amendments).*
- *Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout, Environment Canada EPS 1/RM/13 (Second Edition, 2000 December, with 2007 May and 2016 February amendments).*

1.1.1.1 Port Granby Waste Water Treatment Plant Effluent Monitoring Results

For PG WWTP processing effectiveness and comparison purposes, a weekly grab sample of influent is collected. A summary of influent concentrations is provided in Appendix A.1, Table 2 for information.

A total of 32,321 m³ of effluent was discharged by the PG WWTP in 2024. This represents a increase of approximately 25% from 2023 volumes. The increase in effluent volume was driven by several factors, including increased spring melt water and precipitation in March and April and also equalization pond cleaning activities which required increased production in 2024 August and September. The total volume of water discharged annually for a period of five years is provided in Appendix A.1, Table 3 for information.

A summary of the PG WWTP liquid effluent concentrations and acute toxicity effluent monitoring results is provided in Appendix A.1, Table 4. For the purposes of comparing year over year effluent monitoring results for the past five years, histogram charts are provided in Appendix A.1, Figure 1, Figure 2, Figure 3, and Figure 4. Note that radium-226, total suspended solids (TSS), and total phosphorus, cadmium, selenium, and thallium results were not included, since the analytical results are rarely reported above the parameter laboratory method detection limits.

A review of the data from Figure 1 to Figure 4 yields the following observations:

- During the period of 2020 to 2024, the final effluent results reported by the PG WWTP were generally stable.

- Arsenic results tend to fluctuate over time, depending on total dissolved solids content of the influent water. Reported arsenic concentrations in the final effluent discharge decreased slightly during 2024.
- Total ammonia, nitrate, and nitrite concentrations continue to be near zero during 2024.

During the reporting period, there were no instances where effluent was found to be toxic to aquatic organisms used during analytical sampling.

1.1.1.2 Port Hope Waste Water Treatment Plant Effluent Monitoring Results

For plant processing effectiveness and comparison purposes, a weekly grab sample of influent is collected. A summary of influent average and maximum concentrations is provided in Appendix A.2, Table 5 for information.

A total of 114,982 m³ of effluent was discharged by the PH WWTP in 2024. This represents an increase of approximately 13% from 2023 recorded volumes. The total volume of water discharged annually for a period of five years is provided in Appendix A.2, Table 6 for information.

A summary of the PH WWTP liquid effluent concentrations and acute toxicity effluent monitoring results is provided in Appendix A.2, Table 7. For the purposes of comparing year over year effluent monitoring results for the past five years, histogram charts are presented in Appendix A.2, Figure 5, Figure 6, Figure 7, and Figure 8. Note that radium-226 results were not graphed, since reported analytical results above the method detection limit (0.005 Bq/L) are rarely reported. Cadmium, cobalt, phosphorus, and vanadium were not graphed since monitoring of these parameters began in 2023 May, and the limited data do not provide an effective trend analysis.

A review of the data from Figure 5 to Figure 8 yields the following observation:

- Reported final effluent discharge analytical results for licensed parameters trended downwards or were stable, as can be observed in Figure 5 to Figure 8.

During the reporting period, there were no instances where effluent was found to be toxic to aquatic organisms used during analytical sampling.

1.1.2 Quality Assurance and Quality Control

To confirm the accuracy and precision of laboratory analyses, a quality control regime is followed. For the purposes of the environmental compliance, both duplicate and blank sampling is conducted:

- Duplicate samples are collected at a minimum frequency of once per month.
- Duplicate final effluent toxicity samples are collected each month. To prevent laboratory bias, the duplicate toxicity sample is sent to a different certified laboratory.
- Blank samples are collected at a minimum frequency of once every two months.

Sample nomenclature on quality assurance / quality control samples is blind in nature, ensuring that the analytical laboratory cannot determine the source of the sample.

Blank samples are created using laboratory grade deionized water or commercially available distilled water.

In 2024 October, CNL changed the third-party commercial laboratory used to compete sample analysis and reporting. There are differences in the method detection limits for licensed parameters between the previous commercial laboratory and the current commercial laboratory. This can be observed for some parameters in the histograms presented in Appendices A.1 and A.2.

1.1.3 Regulatory Limit Exceedances and Environmental Contamination Incidents

All reportable events and proactive notifications, including spills to the environment, are summarized in the *Port Hope Area Initiative Waste Management Project Annual Monitoring Report* [2].

During the reporting period, there were no exceedances of regulatory limits.

1.2 Operational Environmental Monitoring

The purpose of the Operational Environmental Monitoring Program is to ensure that the engineering components at the PG and PH LTWMF sites are operating as designed. The methods and protocols followed in performing the operational environmental monitoring are described in the *Port Granby Project Environmental and Biophysical Monitoring Plan* [6] and *Port Hope Project Environmental and Biophysical Monitoring Plan* [8].

The monitoring activities reported in this section were led by CNL, including the collection of field data. Laboratory analytical services were provided by an accredited laboratory under contract to CNL. Laboratories used are accredited to the ISO 17025:2017 standard.

1.2.1 Port Granby Long-Term Waste Management Facility

1.2.1.1 Leachate Monitoring

Leachate collection systems (one in each of two cells) were constructed as components of the base liner system for each cell of the engineered containment system. These sumps are equipped with discharge pumps that pump leachate to the PG WWTP for treatment. The leachate pumping system is equipped with a combined flow totalizer. This flow totalizer is included in the PG WWTP Supervisory Control and Data Acquisition system. The volume of leachate from Cell 1 (PS05) and Cell 2 (PS06) is monitored continuously when leachate is directed to the blending tank in the PG WWTP. When leachate is directed to the Equalization Pond, flow is estimated based on the observed run time of the collection pumps. Planned upgrades to the leachate collection process will provide independent flow monitoring at each pumphouse. Trend analysis of the flow totalizer values indicates whether, over the long term,

an increase in leachate production is occurring. If the leachate production rate appears to be increasing in any leachate collection sump, additional inspections of the final cover are required to determine the potential source(s) of the increased infiltration into the cells. Leachate volumes are provided in Appendix B.1, Table 8 Trend analysis demonstrates that dewatering of the waste in the mound is occurring. Once the volume of pumped leachate stabilizes, a rate of infiltration through the final cover can be estimated from pumped leachate volumes.

1.2.1.2 Rate of Infiltration through the Long-Term Waste Management Facility Cover

The final cover system has a series of capillary drainage layer perimeter drains that are equipped with a theta probe moisture sensor and a thermal conductivity sensor. The theta probe sensors detect increases in soil moisture content that would be indicative of increased infiltration through the final cover system. The thermal conductivity sensors detect decreases in suction pressure readings that would be indicative of increased infiltration through the final cover system. Canadian Nuclear Laboratories conducts routine monitoring of both types of sensors.

1.2.1.3 Operational Groundwater Monitoring

Groundwater wells are routinely monitored to detect any migration of contaminants from the PG and PH LTWMFs via the groundwater pathway and to further monitor the nature, extent, direction, or rate of change of such migration.

During the reporting period, groundwater wells were monitored quarterly. Groundwater monitoring is conducted as part of the Environmental Assessment (EA) Follow-Up Program. The sampling results and discussion are provided in Section 1.3.3.1.

1.2.1.4 Groundwater Seepage Monitoring (bluffs)

Surface water “seep” samples from the south bluffs at the former PG Waste Management Facility are collected quarterly from two locations along the Lake Ontario bluffs, as depicted in Appendix B.2, Figure 9

The results of the bluff seepage sampling are compared to the following:

- *Environmental Assessment Study Report for the Port Granby Project* [11]: According to the baseline predictions, the bluff seepage to Lake Ontario is occurring at a rate of 51,100 m³ per year. The seepage contains uranium (baseline concentration of 0.79 mg/L [790 µg/L]), arsenic (baseline concentration of 0.64 mg/L [640 µg/L]), and radium-226 (baseline concentration of 0.55 Bq/L).
- *Port Granby Project Aquatic Environment Environmental Effects Assessment Report* [12]: Baseline concentrations for arsenic and uranium exceeded their respective interim Ontario Provincial Water Quality Objectives (PWQO) [13]. However, they did not exceed the lowest chronic values for the contribution of contaminants to Lake Ontario. These concentrations are expected to decrease after remediation is complete.

- The *Aquatic Environment Baseline Characterization Study for the Port Granby Project* [14] projected a plume of arsenic and uranium associated with bluff seepage that would cover a very small area (less than 750 m²), with most of the plume predicted to have contaminant concentrations equivalent to approximately 1% of the original concentration observed in the bluff seepage samples. The total contaminant plume to Lake Ontario remains very small. The seepage water quality is expected to improve now that the remediation of the Port Granby Waste Management Facility (PG WMF) is complete and as natural attenuation occurs over time.

Results of the bluff sampling undertaken in 2024 are provided in Appendix B.2, Table 9 and Table 10. Samples were not collected at one location due to unsafe access conditions due to elevated lake water levels (PG-S-1). In 2024, elevated levels of arsenic and uranium were observed in the seepage water that were above the PWQO [13] and/or the Canadian Council of the Ministers of the Environment (CCME) *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CWQG) [15]. Concentrations of some contaminants are slightly increased at PG-S-2, but overall, concentrations for uranium and arsenic have been decreasing since 2020.

1.2.1.5 Sediment Monitoring

Sediment is sampled along the Lake Ontario shoreline near the areas of bluff seepage as depicted in Appendix B.3, Figure 10. The results are compared to the relevant parameters of Ontario's Provincial Sediment Quality Guidelines (PSQG) [16] and the CCME *Canadian Sediment Quality Guidelines for the Protection of Aquatic Life* [17], with consideration for the *Aquatic Environment Baseline Characterization Study for the Port Granby Project* [14].

Sediments in the near shore zones along the bluffs are susceptible to change after every storm event. The natural stratigraphy of the Port Granby bluffs makes them vulnerable to erosion from external factors (e.g., wave action) and internal factors (e.g., high pore water pressure). This natural vulnerability may lead to the brief deposition of nearshore sediments with elevated levels of metals and radionuclides in Lake Ontario. The transient nature of nearshore sediments in Lake Ontario may contribute to alternating exceedances and non-exceedances of metals compared to the PSQG [16]. Sediment quality is expected to improve over time.

Results are provided in Appendix B.3, Table 11 and Table 12. In 2024, arsenic exceeded Ontario's PSQG [16] and the CCME *Canadian Sediment Quality Guidelines for the Protection of Aquatic Life* [17] at sampling location PG-BS-7. Arsenic exceeded the PSQG Lowest Effect Level and CCME Interim Sediment Quality Guidelines [17] in the 2024 June and November samples. The 2024 results show a decrease in some COPCs when compared with previous years.

1.2.1.6 Storm Water Management Pond Monitoring

The storm water management system consists of a series of storm water draining swales that direct non-impacted surface storm water (drainage water) to the north and south storm water management ponds. The storm water management ponds provide flow attenuation by means

of engineered outlets. Discharge of the storm water occurs via draining swales to the north and south tributary, which discharge into Port Granby Creek.

Surface water is sampled monthly at two storm water management ponds at the PG LTWMF, as depicted in Appendix B.4, Figure 11.

The results are compared to the PWQO [13] and the CWQG [15], with consideration for the *Screening Report for Port Granby Long-Term Low-Level Radioactive Waste Management Project* (PGP Screening Report) [19].

Results are provided in Appendix B.4, Table 13 and Table 14. In 2024, monitoring results were consistent with previous years. Both the north (PG-PS1) and south (PG-PS2) storm water ponds demonstrate fluoride exceedances throughout most of 2024. The PGP Screening Report [19] states that the water quality guideline for fluoride was exceeded in the baseline data, which is typical for agriculture/urban watersheds in the region. In the north storm water pond (PG-PS1), arsenic exceeded the CWQG [15] in June, July, and August. The elevated arsenic was not observed in the Port Granby watershed, as discussed in Section 1.4.1.

1.2.2 Port Hope Long-Term Waste Management Facility

1.2.2.1 Operational Groundwater Monitoring

Operational groundwater wells are monitored to detect any migration of contaminants from the PG and PH LTWMFs via the groundwater pathway and to further monitor the nature, extent, direction, or rate of change of such migration.

Groundwater wells are sampled semi-annually (spring and fall) at locations depicted in Appendix B.5, Figure 12. Additional groundwater monitoring is conducted as part of the EA Follow-Up Program. The additional sampling results and discussion are provided in Section 1.3.3.1.

The results of the operational groundwater sampling program are compared to the following:

- The water quality criteria for potable groundwater conditions listed in Table A2.5 of the *Port Hope Long-Term Low-Level Radioactive Waste Management Project* (PHP Screening Report) [20]. This is a conservative approach as groundwater is not potable on site. Continuation in the use of these criteria ensures consistency in reporting with previous years.
- Ontario's groundwater standards, specifically Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition [18].

A summary of the results is provided in Appendix B.5, Table 15. The operational monitoring wells are monitored for arsenic, uranium, and radium-226, as well as for water levels. The analytical results are compared to averages from previous years to identify trends. In 2024, operational monitoring results were consistent with historical data (2020 to 2023), with the exception of OW1-87. Arsenic exceeded values in Table A2.5 of the PHP Screening Report [20]

in the 2024 October sample. The well was re-sampled and the arsenic value was below the comparison criteria. This well will be closely monitored in upcoming sampling campaigns.

During the reporting period, groundwater levels were measured quarterly. The average groundwater levels in monitoring wells are generally comparable to previous years as provided in Appendix C.2, Table 128.

1.2.2.2 Sentinel Well Monitoring

Groundwater samples are collected from the sentinel wells semi-annually (spring and fall) for the in-place management of arsenic under Cell 1 and Cell 2A/B. The results are compared to averages from previous years to identify trends [8], and to the CNL trigger level of 50 µg/L. The trigger level concentration for arsenic is established at 50% of the PWQO [13]. The trigger level is in place as the primary downgradient receptor of groundwater leaving the site is the tributary to Brand Creek (located west of the PH LTWMF).

The sampling results are provided in Appendix B.5, Table 16. In 2024, no groundwater results from the sentinel well monitoring exceeded the arsenic trigger level of 50 µg/L.

1.2.2.3 Residential Well Monitoring

The residential well sampling program is for voluntary primary residents of properties within Ward 1 of the Municipality of Port Hope, situated near the PH LTWMF.

During the reporting period, 14 residential properties participated in the annual program. Participating residents were provided with an analytical bottle set and instructions which follow best practices for sampling. The water collected is not preserved or field filtered for the safety of the residents who collect the sample. The samples are submitted to a third-party laboratory under chain of custody by CNL.

Samples were analyzed for arsenic, radium-226, uranium, and nitrate concentrations, as well as for pH. Residents were notified of the results in writing. Nitrates exceeded the *Ontario Drinking Water Quality Standards* [21] at one property. The exceedance of nitrates has been noted historically at this property and before remedial activities occurred at the PH LTWMF. The exceedance is attributed to the agricultural processes taking place in the general vicinity of the PH LTWMF.

1.3 Environmental Effects Monitoring

The purpose of an environmental effects monitoring program, known as the EA Follow-Up Program, is to verify the accuracy of the EA predictions for the project, and determine the effectiveness of measures taken to mitigate any potential adverse environmental effects. The specific objectives of the EA Follow-Up Program are outlined in the PGP Screening Report [19] and the PHP Screening Report [20].

The EA Follow-Up Program is structured using a framework of six sub-programs. These programs collectively incorporate all the individual activities required for tracking the follow-up

actions prescribed in the PGP Screening Report [19] and the PHP Screening Report [20]. These programs include the following biophysical elements:

- Atmospheric Environment
 - Includes monitoring for air quality, noise, radon, and radiological effects.
- Geology and Groundwater Environment
 - Includes monitoring of soil quality, groundwater quality, and groundwater flow.
- Aquatic Environment
 - Includes monitoring of sediment quality and surface water quality.

The details of the program are established in the *Port Granby Project Environmental and Biophysical Monitoring Plan* [6] and *Port Hope Project Environmental and Biophysical Monitoring Plan* [8].

The information provided in this section was collected during the 2024 reporting period. An update of all the EA commitments for the environmental effects follow-up monitoring are summarized for the PGP and the PHP in Appendix C, Table 17 and Table 18, respectively. Please note that there are differences in required monitoring for Port Hope sites versus the Port Granby site due to the project phase. For example, air monitoring is not required in Port Granby in Phase 3.

1.3.1 Methods

The monitoring activities reported in this section were led by CNL, including the collection of the field data. The methods used and protocols followed in performing the environmental monitoring are described in the PGP and PHP Environmental and Biophysical Monitoring Plans [6] [8]. Analytical services were provided by an external laboratory accredited to ISO 17025:2017.

1.3.2 Atmospheric Environmental Monitoring

The prescribed EA follow-up monitoring activities in the atmospheric environment include elements associated with air quality (radiological and non-radiological parameters), odour and noise monitoring.

Air quality monitoring is intended to identify concentrations of suspended particulate that may have been caused by project activities.

1.3.2.1 Air Quality – Total Suspended Particulate and Particulate Matter

Canadian Nuclear Laboratories monitors air quality both at work sites and in the near vicinity to confirm that mitigation measures to reduce dust and radon at work sites and at the PH LTWMF are effective. Air quality monitoring addresses concentrations of two types of suspended particulate that could potentially be related to project activities:

- Total suspended particulate (TSP) comprising particle sizes less than 44 µm in diameter.
- Particulate matter 2.5 µm (PM_{2.5}) comprising particulate matter with particle sizes less than 2.5 µm in diameter.

Results are compared to limits defined in the PHAI Dust Management and Requirements Plan [9]. The same criteria for TSP are found in Ontario's *Ambient Air Quality Criteria* (AAQC) [22]. In 2012, the CCME adopted the Air Quality Management System as a new comprehensive approach to managing air issues [23]. Canadian Ambient Air Quality Standards for Fine Particulate Matter (PM_{2.5}) are included, which replace the Canada-wide standards developed in 2000. A 2020 value of 27 µg/m³ is used for PM_{2.5}.

In addition, results are compared to relevant predictions made in the PHP Screening Report [20]. It was predicted that the 24-hour AAQC [22] will be exceeded on occasion for arsenic and cobalt at off-site locations. It was predicted that PM_{2.5} will exceed the 24-hour AAQC [22] at some off-site locations.

Additional Analysis (metals and radionuclides)

Additional analysis is conducted on the samples containing the highest net weight of TSP collected each week at the high-volume (Hi-Vol) monitoring stations. These samples are analyzed to determine the concentration of metals and radionuclides in the suspended dust.

The results of the additional analysis are compared to relevant predictions made in the PHP Screening Report [20]. It was predicted that the levels of radionuclides would be below Health Canada reference values. The predicted values were based on modelled particulate matter 10 µm (PM₁₀) concentrations. Comparing particulate radioactivity on TSP filters to the modelled predictions is applying a conservative approach.

Results of the 2024 monitoring are summarized by location in the following subsections.

Port Hope Long-Term Waste Management Facility

Hi-Vol air samplers are operated for a 24-hour period, with the sampling media (filters) changed daily at four locations as depicted in Appendix C.1, Figure 13.

A summary of the results for TSP and PM_{2.5} is provided in Appendix C.1, Table 19 to Table 26.

Total Suspended Particulate

In 2024, the Overriding Limit of 120 µg/m³ for TSP [9] was not exceeded. The PM_{2.5} results (98th percentile averaged over three years [2022, 2023, and 2024]) were compared to 27 µg/m³ as a proactive approach to current industry guidelines. The PM_{2.5} values were above the value of 27 µg/m³ at the 192 Toronto Road, Welcome South, and Weather Station monitoring locations for the PH LTWMF. The exceedances of the 98th percentile were attributed to wildfires in northern Ontario and poor air quality in 2023.

Additional Analysis (metals and radionuclides)

The results of the additional analysis are provided in Appendix C.1, Table 23 to Table 26. In 2024, there were no exceedances of the AAQC [22]. Radium-226 and thorium-232 exceeded the predicted values for some of the filters in 2024; however, they remained well below the Health Canada reference values. Note that the exceedances of the predicted values are related to laboratory detection limits (i.e., uncalculated laboratory results were less than the limit of detection for radium-226 and thorium-232).

In 2024, the 24-hour AAQC [22] was not exceeded in 2024 for arsenic or cobalt. There were exceedances of the PHP Screening Report [20] predicted values for uranium on some of the filters due to laboratory detection limits (uncalculated laboratory results were less than the limit of detection for uranium). Uranium concentrations remained well below the Health Canada reference values.

Highland Drive Landfill and Vicinity Sites

Hi-Vol air samplers are operated for a 24-hour period with the sampling media (filters) changed daily, at three locations as depicted in Appendix C.1, Figure 14. In 2024, (MiniVol) samplers were deployed at two locations (Cavan Candies and Jack Burger) due to ongoing electrical issues with the Hi-Vol air samplers. The Hi-Vol air sampler electrical issues were resolved and the samplers were put back into service 2024 April 08. A summary of the results for TSP and PM_{2.5} is provided in Appendix C.1, Table 27 to Table 31.

Total Suspended Particulate

In 2024, the Overriding Limit of 120 µg/m³ for TSP [9] was not exceeded at the Highland Drive Landfill site.

Particulate Matter

The PM_{2.5} results (98th percentile averaged over three years [2022, 2023, and 2024]) are compared to 27 µg/m³ as a proactive approach to current industry guidelines. The PM_{2.5} values were above 27 µg/m³ at the Cavan Candies, Jack Burger, and Port Hope High School monitoring locations around the Highland Drive site. The exceedances of the 98th percentile were attributed to wildfires in northern Ontario and poor air quality in 2023.

Additional Analysis (metals and radionuclides)

The results of the additional analysis are provided in Appendix C.1, Table 32 to Table 34.

There were no exceedances of the AAQC [22]. Thorium-232 exceeded the predicted values for some of the filters in 2024; however, they remained well below the Health Canada reference values. Note that the exceedances of the predicted values are related

to laboratory detection limits (i.e., uncalculated laboratory results were less than the limit of detection for thorium-232).

In 2024, the 24-hour AAQC [22] was not exceeded for arsenic or cobalt. There were exceedances of the PHP Screening Report [20] predicted values for uranium on some of the filters due to laboratory detection limits (uncalculated laboratory results were less than the limit of detection for uranium). Uranium concentrations remained well below the Health Canada reference values.

Lions Park Recreational Centre

MiniVol air samplers were operated for a 24-hour period with the sampling media (filters) changed daily, at one location as depicted in Appendix C.1, Figure 15. Monitoring in 2024 took place between January and May to align with the remediation activities. The MiniVol samplers were deployed at the Lions Park Recreational Centre sample location due to lack of power source that prevented the use of HiVol air samplers.

A summary of the results for TSP and PM_{2.5} is provided in Appendix C.1, Table 35.

Total Suspended Particulate

In 2024, the Overriding Limit of 120 µg/m³ for TSP [9] was not exceeded at the Lions Park Recreational Centre site.

Particulate Matter

In 2024, the value of 27 µg/m³ for the 98th percentile for PM_{2.5} was exceeded at the Lions Park Recreational Centre site. The PM_{2.5} results (98th percentile) were averaged over two years due to a limited data set. The observed exceedance was attributed to one off-site exceedance in 2024 April and the poor air quality in 2023 due to wildfires in northern Ontario.

1.3.2.2 Air Quality – Independent Dust Monitoring

In accordance with the PHAI Dust Management Requirements and Plan [9], an independent dust monitoring program is executed by a third party. The third-party monitoring is conducted in addition to that conducted by the prime contractor and CNL to ensure that perceived organizational conflicts regarding dust monitoring results and work activities are avoided. Continuous monitoring occurs during work hours, and results are reported in 15-minute intervals.

The independent dust monitoring contractor uses real-time dust monitors to measure TSP at the work site perimeter. The PHAI Dust Management Requirements and Plan [9] identifies the CNL action level for a TSP monitor reading at the work site perimeter to be greater than 120 µg/m³ averaged over 15 minutes. An exceedance of a dust action level triggers an immediate

response by CNL and the prime contractor to initiate corrective action(s) to reduce dust levels; however, it is not an action level as defined by the CNSC and is not a reportable event.

Monitoring by the independent dust monitoring contractor is completed at the PH LTWMF, Highland Drive Landfill, and Small-Scale Site remediations.

Results for the reporting period are discussed by location in the following subsections.

Port Hope Long-Term Waste Management Facility

Real-time dust monitoring results from the independent dust monitoring program for the PH LTWMF is available at PHAI.ca. The weekly reports include daily real-time dust measurements and a site map illustrating the locations of the independent real-time dust monitors.

In 2024, there were no instances when the 15-minute average exceeded the action level of 120 $\mu\text{g}/\text{m}^3$ attributable to on-site sources.

Highland Drive Landfill

In 2024, there were no instances when the 15-minute average exceeded the action level of 120 $\mu\text{g}/\text{m}^3$ attributable to on-site sources.

Small-Scale Site Remediations

In 2024, there were no instances when the 15-minute average exceeded the action level of 120 $\mu\text{g}/\text{m}^3$ attributable to on-site sources.

1.3.2.3 Air Quality – Volatile Organic Compound Monitoring

Volatile organic compound samples are collected weekly at the Chemetron Lagoon, Highland Drive Landfill during disturbance of municipal solid waste, and at the Port Hope Harbour during dredging activities. Summa canisters are placed at two locations, upwind and downwind of the activities. Note that dredging activities are not continuous and did not occur in 2024 January and February at the Port Hope Harbour. Excavation of waste at Chemetron Lagoon only occurred in 2024 January.

The sampling results are compared to Ontario's AAQC [22] 24-hour average. The results are provided in Appendix C.1, Table 36 to Table 41.

In 2024, one exceedance of the Ontario AAQC [22] 24-hour average was observed at the Highland Drive Landfill. An exceedance for chloroform was observed at the Highland Drive Landfill in 2024 October at the upwind monitoring location. No on-site source(s) for the exceedance were observed.

In 2024:

- Remediation of volatile organic compound–related contaminants completed at Chemetron Lagoon in 2024 January.

- Excavation of municipal solid waste at Highland Drive Landfill completed in November.
- Minimal dredging activities remain at the Harbour Centre Pier and are associated with cleaning passes of less than 5% material remaining.

CNL ceased the monitoring of volatile organic compounds using summa canisters at the Harbour Centre Pier and Highland Drive Landfill sites as of 2024 December 31.

1.3.2.4 Air Quality – Polycyclic Aromatic Hydrocarbon Monitoring

Air monitoring at the former coal gasification plant site was to incorporate polycyclic aromatic hydrocarbons due to the possibility of these compounds being found in soil during excavation of the site. Monitoring was to include one polyurethane foam sampler downwind of excavation activities where a power source was available. At the time the monitoring requirements were set, the proposed remedial strategy was open excavation of the site.

However, in 2024 the contractor proposed an alternate remediation strategy for the site that relied on caisson drilling. This strategy reduced the risk of impacting municipal utilities and advanced the remediation timeline. Environmental staff investigated the use of other polycyclic aromatic hydrocarbon monitoring equipment that could be used in tandem with caisson drilling, but ultimately it was determined that polycyclic aromatic hydrocarbon sampling would no longer be effective given the length of time to set up the program, test its effectiveness, and begin monitoring.

As the remediation of the former coal gasification plant site is now finished, CNL is noting that this element of the program was not completed. All other air quality and dust monitoring associated with the remediation of the former coal gasification plant site was completed in line with the requirements of the PHP Environmental and Biophysical Monitoring Plan [8] and the PHAI Dust Management Requirements and Plan [9]. The contractor's air quality monitoring program was completed in line with its project documentation.

1.3.2.5 Air Quality – Ambient Radon and Radon Progeny

In accordance with the PHAI Radiation Protection Plan [24], CNL monitors air for radon and radon progeny to confirm that measures to reduce radon at the LTWMF facilities and remediation sites are effective. Radon detectors known as alpha track (or equivalent) are used for sampling radon in accordance with PGP and PHP Environmental and Biophysical Monitoring Plans [6] [8].

The PHAI Radiation Protection Plan [24] establishes an internal trigger level of 150 Bq/m³ averaged over the time the radon monitor was deployed.

Port Granby Long-Term Waste Management Facility

Radon is monitored monthly or quarterly at the following locations, as depicted in Appendix C.1, Figure 16:

- PG LTWMF (4 locations).
- Port Granby South (3 locations).
- Port Granby community (within a 2 km radius of PG LTWMF) (3 locations).
- Port Granby engineered containment system (8 locations).

Phase 3 monitoring will occur for the next one to two years. Following this monitoring period, a review of results will determine a reduced frequency or termination of monitoring for the remainder of Phase 3.

A summary of radon monitoring results, including background values, are provided in Appendix C.1, Table 42. In 2024, the maximum radon concentration in the Port Granby community was 56 Bq/m³, which is below the environmental trigger level for radon of 150 Bq/m³.

Port Hope Project

Radon is monitored monthly or quarterly at the following locations:

- PH LTWMF (5 locations), as depicted in Appendix C.1, Figure 17.
- Port Hope community (within a 2 km radius of PH LTWMF) (4 locations), as depicted in Appendix C.1, Figure 17.
- Locations where remedial activity lasts longer than one month.
- Port Hope Centre Pier and Harbour (5 locations).
- Highland Drive Landfill (4 locations).
- Waterworks West (West Beach) (4 locations).

A summary of the radon monitoring results, including background values, is provided for the PHP in Appendix C.1, Table 43. In 2024, the maximum radon concentration in the Port Hope community was 78 Bq/m³, which is below the environmental trigger level for radon of 150 Bq/m³.

Pine Street Extension Temporary Storage Site

Radon monitoring activities were conducted quarterly at four locations at the Pine Street Extension Temporary Storage Site as described in the *Port Hope Licensed Sites Environmental Monitoring Program Specifications* document [25]. Four background locations within the Port Hope community were also monitored. The results were compared to the trigger level of 150 Bq/m³ as defined in the *Environmental Parameters Investigative and Corrective Measures Thresholds for Environmental Monitoring of WNSL-W1-182 Licensed Activities* document [26].

The sampling results are provided in Appendix C.1, Table 44. During the 2024 sampling period, no individual quarterly measurements exceeded the radon in air trigger level of 150 Bq/m³ at any of the Pine Street Extension Temporary Storage Site locations or at the Port Hope

community background locations. The 2024 average radon concentration at the Pine Street Extension Temporary Storage Site was 40.0 Bq/m³.

1.3.2.6 Odour Monitoring

Odour sampling occurs at upwind and downwind residential receptor locations in the vicinity of the Highland Drive Landfill and Port Hope Harbour remediation sites.

The higher the dilution-to-threshold (D/T) ratio, the stronger the odours. In general, odour annoyance resulting in complaints can be expected when ambient odour concentrations reach a level 5 times the threshold value (5 D/T). Based on the general understanding that odour annoyance for the most offensive odours begins at about 5 D/T; this is applied as the threshold level above which mitigation measures are triggered or assessed for effectiveness [8].

Results for the reporting period are discussed by location in the following subsections.

Highland Drive Landfill

In 2024, odour samples were collected twice daily during waste removal at the Highland Drive Landfill. Note that waste removal is not continuous. There were no instances when the threshold value of 5 D/T was reached during waste removal at the Highland Drive Landfill off-site receptor locations.

Port Hope Harbour

In 2024, odour samples were collected twice daily during the sediment dredging and dewatering activities at the Port Hope Harbour. Note that these activities were not continuous. There were no instances when the threshold value of 5 D/T was reached during sediment dredging and dewatering activities at the Port Hope Harbour off-site receptors.

1.3.2.7 Noise Monitoring

Noise is generally defined as unwanted sound. Noise monitoring is conducted by measurement of sound levels at the remediation sites to confirm compliance with appropriate by-laws and regulations (World Health Organization [WHO] *Guidelines for Community Noise* [27]). Qualitative criteria for noise impacts are also used to assess measured increases above the background sound levels. The results are compared to predictions made in the PHP Screening Report [20].

Results for the 2024 reporting period are discussed by location in the following subsections.

Port Hope Long-Term Waste Management Facility

Sound level data are collected quarterly at several locations as depicted in Appendix C.1, Figure 18. For residents adjacent to the PH LTWMF during construction and development, the noise levels were predicted to increase by approximately 12 dBA [20]. In addition, results are

compared to baseline data collected in 2015 when the level of activity around the site was comparatively low.

The results of the noise monitoring campaigns, averaged logarithmically over three working days, are provided in Appendix C.1, Table 45. In comparing 2024 results to the 2015 baseline results, the following observations were made:

- An increase of 5 dBA was observed at location PH-N-0001 and PH-N-0006.
- An increase of 6 dBA was observed at location PH-N-0003.
- A decrease of 1 dBA was observed at PH-N-0002.
- An increase of 1 dBA was observed at location PH-N-0004.
- An increase of 12 dBA was observed at location PH-N-0005.
- An increase of 5 dBA was observed at PH-N-0006.

All values were below the WHO *Guidelines for Community Noise* [27] level of 70 dB over a 24-hour period.

Northern, Central, and Southern Transportation Routes

Spot sound level data are collected at one-hour intervals morning and evening seasonally, during peak transportation activities on the PHP transportation routes. The monitoring locations are depicted in Appendix C.1, Figure 19. Sound levels from increased truck traffic on the designated transportation routes were predicted to increase by approximately 1 to 2 dBA [20]. In addition, results are compared to the revised baseline data that was collected in 2018 before the transportation routes were being used by CNL.

The results of the noise monitoring campaigns, averaged logarithmically over three working days, are provided in Appendix C.1, Table 46. The 2024 monitoring results for the southern, central, and northern transportation routes showed little to no increase from the 2018 baseline monitoring data. All values were below the WHO *Guidelines for Community Noise* [27] level of 70 dB over a 24-hour period.

Highland Drive Landfill and Vicinity Sites

Sound level data are collected at three locations around the Highland Drive and vicinity sites as depicted in Appendix C.1, Figure 20. Sound levels were predicted to increase by approximately 5 to 10 dBA [20].

The results of the noise monitoring campaign, averaged logarithmically over three working days, are provided in Appendix C.1, Table 47. In comparing 2024 results to the 2020 baseline results, the following observations were made:

- An increase of 6 dBA was observed at location HD-N-0002.

- All values were below the WHO *Guidelines for Community Noise* [27] level of 70 dB over a 24-hour period.

Alexander Street Ravine

Sound level data are collected at three locations around the Alexander Ravine as depicted in Appendix C.1, Figure 21. Sound levels were predicted to increase by 13 dBA [20].

The results of the noise monitoring campaign averaged logarithmically over three working days, are provided in Appendix C.1 , Table 48. In comparing 2024 results to the 2023 baseline results, the following observations were made:

- A decrease of 1 dBA was observed at location AR-N-0002.
- A decrease of 1 dBA was observed at location AR-N-0003.

All values were below the WHO *Guidelines for Community Noise* [27] level of 70 dB over a 24-hour period.

1.3.3 Geology and Groundwater Monitoring

The prescribed monitoring activities in the geology and groundwater environment include elements associated with groundwater flow and quality, drainage water quality, and soil quality.

1.3.3.1 Groundwater (flow and quality) Monitoring

Groundwater flow and quality monitoring is performed quarterly at the PG LTWMF [6] and twice per year at both the PH LTWMF and the Highland Drive site [8]. The monitoring results are compared against:

- The applicable water quality criteria for potable groundwater conditions listed in the PGP Screening Report [19] and the PHP Screening Report [20]. On-site water is not potable. This conservative approach is taken to ensure consistency with reporting from previous years.
- Ontario's groundwater standards, specifically Table 3 – Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition (Ontario's Table 3 Standard) [16].

Monitoring of the groundwater conditions continue through Phases 2 and 3 of the project, and improvements to groundwater quality are expected to occur as the site is remediated. Once remediated, the groundwater in the vicinity and downgradient of the landfill will naturally attenuate.

Results for the reporting period are discussed by location in the following subsections.

Granby Long-Term Waste Management Facility

During the reporting period, groundwater wells were sampled quarterly at 54 of the 68

locations, in conjunction with the measurement of groundwater static levels, as depicted in Appendix C.2, Figure 22.

Groundwater quality results are provided in Appendix C.2, Table 49 to Table 104. In 2024, exceedances of the criteria identified in the PGP Screening Report [19] were observed at 10 locations as follows:

- Exceedances were observed at locations PG-MW6C-22, PG-MW7B-22, PG-MW8B-22, PG-MW8C-22, PG-MW10A-22, and PG-MW9A-22. The values for 2024 are consistent with the bluff seepage sampling results observed in previous years.
- Exceedances were observed at PG-BH214-22 (arsenic) and PG-BH404-22 (uranium). Values are consistent with historical site results.
- At location PG-MW15D-22, an exceedance of the criteria for arsenic was observed. Canadian Nuclear Laboratories continues to investigate the source of the elevated arsenic.
- A barium exceedance was identified at PG-MW3A-02, which is the site's most northerly well. The elevated barium is consistent with monitoring data collected in previous years. As groundwater in the region generally flows south towards Lake Ontario, these elevated concentrations are likely originating from an alternative source. Exceedances were not observed at any of CNL's other monitoring wells.
- The following wells had insufficient volumes to support sampling: PG-BH1003E, PG-BH1003F, PG-MW03-03A, PG-MW2A-02, PG-MW2C-02, PG-MW7A-22, PG-MW7C-22, PG-MW9B-22, PG-MW9C-22, PG-MW10B-22, PG-MW14A-22 and PG-MW14B-22.
- PG-MW6B-22 and PG-MW03-02B were not sampled due to damage and/or well complications.

Groundwater levels are provided in Appendix C.2, Table 105. Average groundwater levels are comparable to previous years.

Port Hope Long-Term Waste Management Facility

During the reporting period, groundwater wells were sampled semi-annually at 22 locations, as depicted in Appendix B.5, Figure 12. Groundwater was not sampled at WC-MW2-02 due to possible well damage that CNL is currently assessing. Additional groundwater monitoring is conducted as part of the Operational Environmental Monitoring Program. The additional sampling results and discussion are provided in Section 1.2.2.1 and Section 1.2.2.2.

Groundwater quality results are provided in Appendix C.2, Table 106 to Table 127.

In 2024, samples collected from location WC-MW3A-11R exceeded the criteria for barium in both monitoring campaigns. Exceedances for barium have been observed in previous years and were present before construction of the PH LTWMF. As monitoring of groundwater conditions

continues through Phases 2 and 3 of the PHP, improvements to groundwater quality are expected to occur as the portions of the legacy site are remediated, and through natural attenuation. WC-OW1-87 also exceeded for cobalt, lead, and arsenic. Canadian Nuclear Laboratories continues to assess the elevated arsenic noted in WC-OW1-87 in fall 2024, including increased sampling frequency.

Groundwater levels are measured quarterly. Groundwater levels are provided in Appendix C.2, Table 128. In 2024, average groundwater levels are comparable to previous years.

Highland Drive Landfill

During the reporting period, groundwater wells were sampled semi-annually at 20 of the 28 sampling locations depicted in Appendix C.2, Figure 23. The disparity in the number of sampling locations is due to the following factors:

- Some groundwater wells were abandoned and decommissioned to allow remediation of the Highland Drive Landfill site.
- Some groundwater wells were damaged and could not be sampled.
- Some groundwater wells had elevated radon levels.

Effects on groundwater quality are expected to be minimal and slow to develop. The data collected during Phase 2 can be considered to complement the baseline water quality data. The data will be used to establish a typical range of groundwater parameter concentrations for each monitoring well to verify the effectiveness of the remedial efforts.

Groundwater quality results are provided in Appendix C.2, Table 129 to Table 148. In 2024, uranium exceedances were noted at eight locations. An arsenic exceedance was noted at one location. Exceedances of uranium and arsenic are the result of the effects of the LLRW comingled with the municipal solid wastes at the Highland Drive Landfill site. An installation of a permeable reactive barrier downgradient of the Highland Drive Landfill in the Highland Drive South Ravine will also assist with the remediation of the contaminants in the groundwater.

Groundwater levels are measured quarterly. Groundwater levels are provided in Appendix C.2, Table 149. In 2024, of the 21 wells available for monitoring, all 21 had calculated water levels; reference groundwater elevation data were not available for 2 wells.

1.3.3.2 Soil Monitoring

Soil sampling is conducted annually to determine if there has been an increase in contaminant concentrations as a result of windblown dust deposition. Soil sampling activities involve the collection of surface soil samples from off-site perimeter locations around the PG LTWMF, the PH LTWMF, and the Highland Drive remediation site. These samples are analyzed for metals and radionuclides.

The soil samples consist of a composite sample that is composed of a minimum of five individual samples. The samples are retrieved from within a 10 m radius of the target sampling

location from a 0 to 5 cm depth in Port Granby and 0 to 2 cm in Port Hope, after removal of the grass layer. They are homogenized and used to create the composite sample for each of the required sampling locations.

The results are compared to previous years and predictions made in the following:

- The PGP Screening Report [19]: No likely residual adverse effects to soil quality were predicted, with exception of thorium-230. Thorium-230 was expected to increase 38% in concentration over baseline.
- The PHP Screening Report [20]: Maximum concentrations of arsenic and cobalt at the perimeter of the PH LTWMF were predicted to be 4.7 and 6.67 µg/g, respectively. During construction of the PH LTWMF, mean concentrations of thorium-230 were predicted to be 97.7 Bq/kg (0.0977 Bq/g) and maximum concentrations to be 41.9 Bq/kg (0.1419 Bq/g).

Results for the reporting period are discussed by location in the following subsections.

Port Granby Long-Term Waste Management Facility

Soil samples are collected annually at five locations as depicted in Appendix B.4, Figure 11. The results are provided in Appendix C.2, Table 150 to Table 154. In 2024, soil located around the PG LTWMF site was sampled and analyzed for metals and radionuclides. Soil concentrations in 2024 have remained consistent with baseline data and monitoring data from previous years. Thorium-230 concentrations in 2024 are above the predicted values at some locations due to the laboratory detection limits.

No concerns related to predictions [19] were noted in the 2024 results. As such, CNL will be ceasing the soil monitoring at the end of 2024 around the PG LTWMF site, as the commitment from the PGP Environmental and Biophysical Monitoring Plan [6] has been met (i.e., sampling for one year following completion of remedial activities).

Port Hope Long-Term Waste Management Facility

Soil samples are collected annually at five locations as depicted in Appendix C.2, Figure 24. The results are provided in Appendix C.2, Table 155 to Table 159. A sample could not be collected at PH-WWMF-SS-005 as it was unsafe to proceed to this sampling location. In 2024, the concentration of arsenic and cobalt exceeded the predicted concentration at one location (PH-WWMF-SS-01). The concentrations of arsenic and cobalt were below predicted values at the remaining three sampling locations. Values above the predicted concentrations have been observed in previous years at PH-WWMF-SS-01. Thorium-230 concentrations in 2024 were above the predicted mean and maximum values at some locations due to the laboratory detection limits.

Highland Drive Landfill

Soil samples are collected annually at two locations as depicted in Appendix C.2, Figure 25. The results are provided in Appendix C.2, Table 160 and Table 161. In 2024, results indicated that COPC concentrations decreased in comparison to data collected in previous years, including the baseline data.

1.4 Aquatic Environmental Monitoring

The Aquatic Environmental Monitoring Program includes sampling surface water to verify the accuracy of the predictions made during the EA. The expected long-term environmental effect from the PHAI is improved surface water quality. Improvements are expected due to the decrease in contaminated water migrating upwards through the soil horizon from underlying groundwater sources.

Results for the reporting period are discussed by location in the following subsections.

1.4.1 Port Granby Long-Term Waste Management Facility Watershed

Surface water samples are collected quarterly at the locations depicted in Appendix B.4, Figure 11.

Results are compared to the PWQO [13] and CWQG [15] (where available) and to predictions made in the PGP Screening Report [19].

Port Granby Creek Surface Water Quality

The water flowing in Port Granby Creek is sampled at two locations: upstream and downstream of the PG LTWMF. The PGP Screening Report [19] predicted no measurable change to Port Granby Creek surface water quality as a result of project activities.

The results are provided in Appendix C.3, Table 162 to Table 163. In 2024, no changes in water quality were observed.

Port Granby Creek Storm Event Sampling

In 2024, Port Granby Creek was monitored during one storm event in April. The results are provided in Appendix C.3, Table 164. The contaminant concentrations were observed to peak as TSS increased. Total suspended solids concentrations at the peak of the storm event were 208 mg/L, compared to 9 mg/L as the storm event sampling commenced. As TSS levels increased, cobalt was observed to exceed the PWQO [13]. Historically, cobalt has exceeded the PWQO [13] in both the upstream and downstream monitoring locations.

Lake Ontario Surface Water Quality

The surface water of Lake Ontario is sampled quarterly (if safely accessible) at three locations, as depicted in Appendix C.3, Figure 26, to verify that the water quality in the vicinity of the diffuser discharge and the associated mixing zone is not affected by operations of the PG

LTWMF. The surface water is sampled at the diffuser (location PG-LO-D) and approximately 20 m east and west of the diffuser (locations PG-LO-E and PG-LO-W respectively). The PGP Screening Report [19] predicted there will be a long-term improvement and reduced contaminant loading to Lake Ontario as a result of the PGP.

In 2024, three of the four quarterly sampling campaigns were completed. Samples were not collected for the winter season due to unsafe boating conditions on Lake Ontario. The results are provided in Appendix C.3, Table 165 to Table 167. An exceedance of the CWQG for mercury [15] was noted at all sampling locations. Results have remained consistent with mixing zone monitoring data, illustrating that water quality at the diffuser is not affected by current operations. As such, CNL ceased the Port Granby Lake Ontario surface water monitoring program at the end of 2024, as the commitment from the PGP Environmental and Biophysical Monitoring Plan [6] has been met. Canadian Nuclear Laboratories has sampled more than one year since closure of the LTWMF, and water quality results are comparable to baseline results.

Port Granby Long-Term Waste Management Facility Drainage Water

Drainage water is sampled semi-annually at one location, as depicted in Appendix B.4, Figure 11. The results are compared to the PWQO [13] and the CWQG [15] and to predictions made in the PGP Screening Report [19]. The PGP Screening Report [19] predicted no measurable changes in quality or quantity of drainage water as a result of the project.

The results are provided in Appendix C.3, Table 168. In 2024, no exceedances were observed. Results were consistent with monitoring data over the last few years and the predictions made in the PGP Screening Report [19]

1.4.2 Port Hope Long-Term Waste Management Facility Watershed

Surface water samples are collected quarterly at seven locations as depicted in Appendix C.3, Figure 26. Results are compared to the PWQO [13] and CWQG [15] (where available) and to predictions made in the PHP Screening Report [20]. It was predicted that the removal of contaminated material from the remediation sites will result in improvements to down-gradient surface water quality.

Brand Creek Surface Water Quality

The results for Brand Creek are provided in Appendix C.3, Table 169. In 2024, CNL was unable to conduct surface water monitoring at three of the four sampling locations within the tributary to Brand Creek and within Brand Creek. Access to sampling locations BC-U, BC-T, and BC-D requires CNL staff to traverse privately owned property. In 2024, the property owner informed CNL that access to these locations is no longer permitted. Given the ongoing access restrictions, CNL will be removing sampling locations BC-U, BC-T, and BC-D from the Phase 2 and Phase 3 monitoring requirements of the PHP Environmental and Biophysical Monitoring Plan [8]. However, CNL staff continue to access monitoring location BC-M, the downstream site where quarterly surface water and water level monitoring, as well as the annual storm event sampling,

are conducted. Since 2020, data have remained consistent for all parameters in alignment with baseline conditions.

No exceedances of the PWQO [13], CWQG, and predictions were observed in the 2024 samples at BC-M. The results are consistent with the pre-construction baseline monitoring data from 2016, suggesting that the construction of the PH LTWMF is not having an adverse effect on Brand Creek water quality.

Brand Creek Storm Event Monitoring

In 2024, Brand Creek was monitored during one storm event in July. The results are provided in Appendix C.3, Table 170. The contaminant concentrations were observed to peak as TSS increased. Total suspended solids concentrations at the peak of the storm event were 153 mg/L, compared to 6 mg/L as the storm event sampling commenced. As TSS levels increased, cobalt, copper, and vanadium were observed to exceed the PWQO [13].

Lake Ontario Surface Water Quality

The surface water of Lake Ontario is sampled quarterly (if safely accessible) at three locations: the diffuser (location BC-LO-D), and approximately 20 m east and 20 m west of the diffuser (location BC-LO-E and BC-LO-W, respectively). Surface waste sampling is conducted to verify that the water quality in the vicinity of the diffuser discharge and the associated mixing zone is not affected by operations of the PH LTWMF. The PHP Screening Report [20] predicted a long-term improvement and reduced contaminant loading to Lake Ontario as a result of project activities.

The results are provided in Appendix C.3, Table 171 to Table 173. In 2024, three of the four quarterly sampling campaigns were completed. Samples were not collected for the winter season due to unsafe boating conditions on Lake Ontario. There were no observed exceedances of PWQO [13] or CWQG [15] in 2024. The results were generally consistent with monitoring data over the last few years, suggesting that current operations have not had an adverse effect on water quality. The results from location BC-LO-D, relative to the mixing zone samples (BC-LO-E and BC-LO-W) were also comparable, suggesting that water quality at the diffuser is not affected by current operations.

Port Hope Long-Term Waste Management Facility Drainage Water

The drainage water (storm water and leachate) from the PH LTWMF engineered containment system is collected in the on-site treatment ponds and is sampled semi-annually at four locations, as depicted in Appendix C.3, Figure 27.

The results are provided in Appendix C.3, Table 174 to Table 176. A data table is not provided for location WC-SW4-02. It was not sampled in 2024 and the previous five years due to an insufficient volume of water. Historically, this location has intermittent drainage water present, and samples cannot always be collected [13][15].

In 2024, elevated concentrations of some COPCs were identified in the results; however, these results were consistent with previous years. Changes in drainage water quality and volume were expected to occur after remediation work commenced. Drainage water at the PH LTWMF is treated before it is released to the environment.

1.4.2.1 Port Hope Project Highland Drive Landfill Watershed

Brewery Creek Surface Water Quality

Surface water samples are collected quarterly at two locations, one upstream (GRT-3) and one downstream (GRT-3B), as depicted in Appendix C.3, Figure 28.

The results are provided in Appendix C.3, Table 177 and Table 178. In 2024, no exceedances of the PWQO [13] or CWQG [15] were observed.

Highland Drive South Creek Surface Water Quality

Highland Drive South Creek is subject to the influences of the Highland Drive Landfill as it is located downgradient. As discussed in the *Port Hope Project Environmental Assessment Study Report* (PHP EA Study Report) [28], the evaluation of water quality changes in Highland Drive South Creek is based on expected changes in loadings from groundwater and would not increase during site remediation. The concentrations of key contaminants (uranium and arsenic) are expected to decrease by between 78% and 88% in the longer term.

The water flowing in Highland Drive South Creek is sampled quarterly at two locations (one upstream [HC-U] and one downstream [HC-D]), as depicted in Appendix C.3, Figure 29.

The results are provided in Appendix C.3, Table 179 and Table 180. In 2024, exceedances of the PWQO [13] and/or CWQG [15] were observed for arsenic, boron, copper, and uranium at both the upstream and downstream locations in all four sampling campaigns. Results are consistent with the results from the baseline sampling in 2013.

Highland Drive South Creek Storm Event Monitoring

In 2024, Highland Drive South Creek water quality was monitored during one storm event in April. One sample per hour for six hours was collected for a total of six samples. The results are provided in Appendix C.3, Table 181

The contaminant concentrations were observed to peak as TSS increased. Total suspended solids concentrations at the peak of the storm event were 5 mg/L. Arsenic, boron, and uranium were observed to exceed the PWQO [13] and/or CWQG [15] throughout the storm event. Concentrations of COPCs associated with the source of contamination are predicted to decline in surface water once the remediation of the Highland Drive Landfill is complete.

1.4.3 Alexander Street Ravine Watershed

Alexander Creek Surface Water Monitoring

Surface water samples are collected quarterly at two locations (upstream [AC-1b] and downstream [AC-3a]) as depicted in Appendix C.3, Figure 30. Due to the limitations of site access due to the remedial activities, the upstream and downstream monitoring locations were shifted. For comparison, the baseline location (AC-1 and AC-3) data are presented alongside the updated sampling location.

The results are provided in Appendix C.3, Table 182 and Table 183. In 2024, construction monitoring took place. The results were compared to the 2023 data, which are considered pre-construction/updated baseline. The results were less than the PWQO [13] and CWQG [15] with the exception of uranium at the downstream location. At location AC-3a, uranium has historically exceeded in Alexander Creek, likely due to the influence of buried deposits of LLRW within the Alexander Street Ravine. These localized areas of contamination are currently being removed, and concentrations of uranium are expected to decrease in Alexander Creek after remediation is complete.

1.4.3.1 Port Hope Harbour

The Lake Ontario surface water is sampled quarterly at three locations in the Port Hope Harbour as depicted in Appendix C.3, Figure 31. During the periodic dredging operations at the Port Hope Harbour, surface water is sampled weekly at two locations, as depicted in Appendix C.3, Figure 32.

The results are compared to previous years and predictions made in the PHP Screening Report [20]. The predictions are as follows:

- Concentrations of uranium are predicted to increase in the area between the harbour and the Ganaraska River.
- Once contaminated sediment is removed from the harbour, water quality is predicted to improve [28].
- Predictions from the PHP EA Study Report [28] used theoretical or predicted data inputs to a model that was used to determine predicted values. Actual conditions related to daily inputs of water to the inner harbour during dredging have resulted in a different set of conditions, requiring that the proposed EA mitigation measures be modified. Canadian Nuclear Laboratories engaged Responsible Authorities to ensure a path forward for the protection of Lake Ontario and the Ganaraska River. This has resulted in the creation of a robust monitoring program (an “Action Plan” established in 2021) to ensure the protection of the aquatic environment while dredging activities continue within the Port Hope Harbour.

Lake Ontario Surface Water Quality

The results are provided in Appendix C.3, Table 184 to Table 186. In 2024, concentrations of uranium were observed to exceed the PWQO [13] [15] at one location (PHH-2). Mercury exceeded the CWQG [15] at PHH-4 due to the laboratory detection limits. There were no other exceedances of the PWQO [13] and/or CWQG [15] at locations PHH-1 or PHH-4, demonstrating that there were no impacts to Lake Ontario or Ganaraska River surface water quality.

Lake Ontario Surface Water Quality during Dredging Activities

The results are provided in Appendix C.3, Table 187 and Table 188. In 2024, concentrations of arsenic, uranium, cobalt, and lead were observed to exceed the PWQO [13] and/or CWQG [15] at one location (PHH-2a). One exceedance of the PWQO [13] for cobalt was noted in 2024 April at PHH-1. Selenium exceeded the CWQG [15] at both PHH-2a and PHH-1a due to the laboratory detection limits. The laboratory has been contacted to provide a lower detection limit in future sampling campaigns. No other exceedances were noted at location PHH-1a, demonstrating that there were no impacts to Lake Ontario or Ganaraska River surface water quality.

Lake Ontario Turbidity Monitoring

During the periodic dredging activities in the Port Hope Harbour, turbidity monitoring is conducted daily, including in-water and near-water works, in the Port Hope Harbour at four locations as outlined in the *Port Hope Harbour Turbidity Monitoring Work Plan* [29] (one location upstream in the Ganaraska River, two locations south of the Wave Attenuator, and one location near the entrance channel in Lake Ontario).

In 2024, the prime contractor provided a summary of the results to CNL monthly for review. No turbidity exceedances were observed in 2024 that were attributed to CNL activities.

1.4.4 Temporary Storage Site Monitoring

Pine Street Extension Temporary Storage Site Surface Water Monitoring

The Pine Street Extension Temporary Storage Site catch basins are designed to catch surface water run-off from the internal drainage ditches, and to allow sediments to settle before water discharges to the internal drainage swales and into the storm water management pond. Surface water samples are collected quarterly from the three catch basins at Pad 2, and the surface water management pond east of Pad 2, as depicted in Appendix C.3, Figure 33

Surface water monitoring activities were conducted as described in the *Port Hope Licensed Sites Environmental Monitoring Program Specifications* document [25]. The results are compared to the trigger levels defined in the *Environmental Parameters Investigative and Corrective Measures Thresholds for Environmental Monitoring of WNSL-W1-182 Licensed Activities* document [26].

The sampling results are provided in Appendix C.3, Table 189. In 2024, no exceedances of trigger levels were observed.

2 Concluding Remarks

Canadian Nuclear Laboratories is committed to achieving high standards of operational environmental protection. The information and data presented in this report support the conclusion that safe and secure performance was achieved at the PHAI.

This Environmental Protection Annual Compliance Monitoring Report demonstrates that CNL's PHAI has successfully met the requirements of the *Nuclear Safety and Control Act*, associated regulations, and the CNSC Waste Nuclear Substance Licence requirements. Canadian Nuclear Laboratories continues to make adequate provisions to protect the public and the environment.

3 Acronyms

Acronym	Definition
AAQC	Ambient Air Quality Criteria
ALARA	As Low As Reasonably Achievable
CCME	Canadian Council of Ministers of the Environment
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
COPC	Contaminants of Potential Concern
CWQG	Canada Water Quality Guidelines
EA	Environmental Assessment
D/T	dilution-to-threshold
LLRW	Low Level Radioactive Waste
MECP	Ministry of the Environment, Conservation, and Parks (Ontario)
PM	Particulate Matter
PG LTWMF	Port Granby Long-Term Waste Management Facility
PGP	Port Granby Project
PG WMF	Port Granby Waste Management Facility
PHAI	Port Hope Area Initiative
PH LTWMF	Port Hope Long-Term Waste Management Facility
PHP	Port Hope Project
PH WWTP	Port Hope Waste Water Treatment Plant
PSQG	Provincial Sediment Quality Guideline
PWQO	Provincial Water Quality Objectives
TSP	Total Suspended Particulate
TSS	Total Suspended Solids
WHO	World Health Organization

4 References

- [1] *An Agreement for the Cleanup and Long-Term Safe Management of Low-Level Radioactive Waste Situated in The Town of Port Hope, The Township of Hope and the Municipality of Clarington*, 4500-513700-110-11000-008, 2001 March 29.
- [2] *Port Hope Area Initiative Waste Management Project Annual Compliance Report for 2024*, 4500-508760-ACMR-2024, Revision 0, 2024 April.
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Appendix A Environmental Compliance Monitoring**A.1 Port Granby Waste Water Treatment Plant Monitoring****Table 2: Port Granby Waste Water Treatment Plant – 2024 Liquid Influent Sampling**

Influent Parameter (unit of measure)	Average Value	Maximum Value
Radium-226 (Bq/L)	0.38	1.36
pH	8.1	8.8
Nitrite (mg/L)	0.2	0.3
Nitrate (mg/L)	0.7	4.3
Total Suspended Solids (mg/L)	100	304
Total Ammonia-N (mg/L)	1.0	4.8
Total Phosphorus (mg/L)	4.4	7.0
Total Arsenic (µg/L)	1,530	2,690
Total Cadmium (µg/L)	0.1	0.8
Total Cobalt (µg/L)	15	30
Total Copper (µg/L)	11.3	27.2
Total Molybdenum (µg/L)	221	410
Total Selenium (µg/L)	1.3	10.0
Total Thallium (µg/L)	0.02	0.25
Total Uranium (µg/L)	1,614	2,700
Total Vanadium (µg/L)	17	26
Note: Sampling frequency is weekly (as available); in 2024 there were 44 samples.		

Table 3: Port Granby Waste Water Treatment Plant Production Quantities of Effluent – Five-Year

Month	2020 Effluent (m ³)	2021 Effluent ^a (m ³)	2022 Effluent (m ³)	2023 Effluent (m ³)	2024 Effluent (m ³)
January	20,153	2,055	3,682	4,178	3,544
February	18,680	0	3,492	2,007	3,794
March	22,264	3,195	7,046	2,749	3,811
April	11,737	4,432	4,291	3,123	5,108
May	11,721	1,895	2,727	3,214	3,315
June	6,550	0	1,990	2,318	1,271
July	1,317	5,285	4,058	1,422	3,786
August	6,006	3,626	3,110	1,161	2,220
September	12,044	8,499	2,451	639	1,998
October	2,470	14,573	1,863	924	812
November	5,247	8,467	1,562	2,062	349
December	4,842	3,299	1,185	2,120	2,313
TOTAL	123,031	55,326	37,457	25,917	32,321

a. No effluent was produced during the months of February and June 2021.

Table 4: Port Granby Waste Water Treatment Plant – 2024 Liquid Effluent Sampling

Effluent Parameter (unit of measure)	Total No. of Samples ^a	Maximum Value	Mean Value	Action Level (weekly mean concentration composite sample)	Release Limit (weekly mean concentration composite sample)	Release Limit (monthly mean concentration composite sample)	No. of Samples Exceeding the Action Level	No. of Samples Exceeding the Release Limit
Acute Toxicity	11	-	-	-	-	Cannot be toxic	-	0
Radium-226 (Bq/L)	40	<0.01	<0.006	0.05	0.74	0.37	0	0
Total Arsenic (µg/L)	40	19.6	2.9	50	200	100	0	0
Total Cadmium (µg/L)	40	0.22	<0.013	1	2	1	0	0
Total Cobalt (µg/L)	40	0.27	<0.05	5	10	5	0	0
Total Copper (µg/L)	40	2.0	<0.28	5	10	5	0	0
Total Molybdenum (µg/L)	40	6.5	<0.58	39	-	-	0	-
Total Phosphorus (mg/L)	40	0.06	<0.01	0.2	0.7	0.35	0	0
Total Selenium (µg/L)	40	0.04	<0.04	0.5	60	30	0	0
Total Thallium (µg/L)	40	0.006	<0.005	0.5	16	8	0	0
Total Uranium (µg/L)	40	15.5	1.8	50	200	100	0	0
Total Vanadium (µg/L)	40	0.34	<0.07	5	80	40	0	0
Total Ammonia-N (mg/L)	40	0.22	<0.06	4.9	11.5	5.75	0	0
Nitrite (mg/L)	40	0.06	<0.03	1.5	3	1.5	0	0

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Effluent Parameter (unit of measure)	Total No. of Samples ^a	Maximum Value	Mean Value	Action Level (weekly mean concentration composite sample)	Release Limit (weekly mean concentration composite sample)	Release Limit (monthly mean concentration composite sample)	No. of Samples Exceeding the Action Level	No. of Samples Exceeding the Release Limit
Nitrate (mg/L)	40	0.1	<0.06	32	150	75	0	0
pH	40	7.96	7.56	6.5–8.5	<6 or >9.5	<6 or >9.5	0	0
Total Suspended Solids (mg/L)	40	1.0	<1.0	7.5	30	15	0	0

Notes:

Action levels and release limits for liquid effluent are defined in the *Port Granby Project, Environmental and Biophysical Monitoring Plan* [6].

a. The total number of effluent samples is less than the total number of influent samples (Table 2) due to recirculation mode operations, where no releases were made.

< – some or all results were below the minimum detection limit; -- .

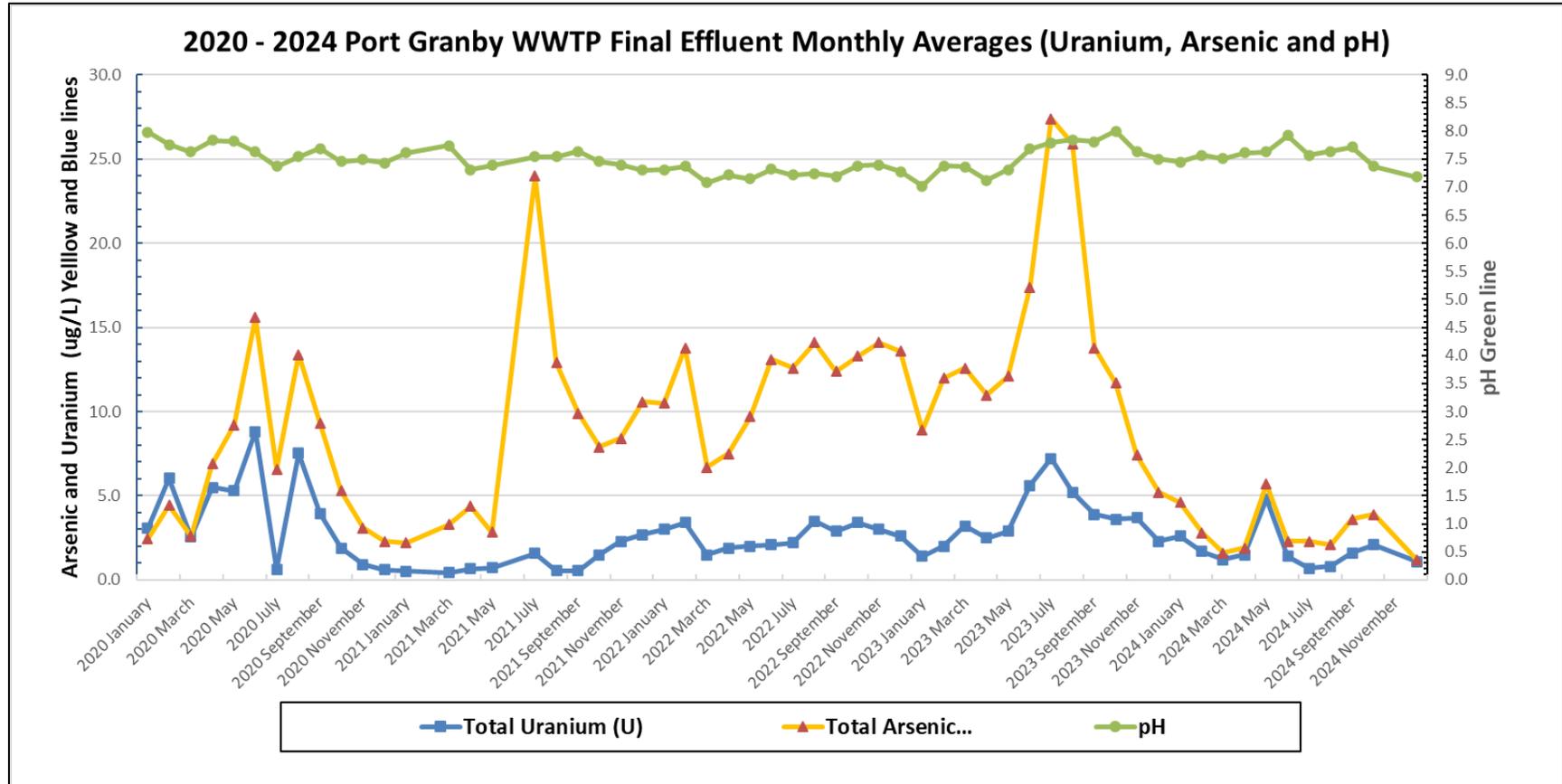


Figure 1: Port Granby Waste Water Treatment Plant Final Effluent Monthly Averages for Total Uranium, Total Arsenic, and pH – Five-Year

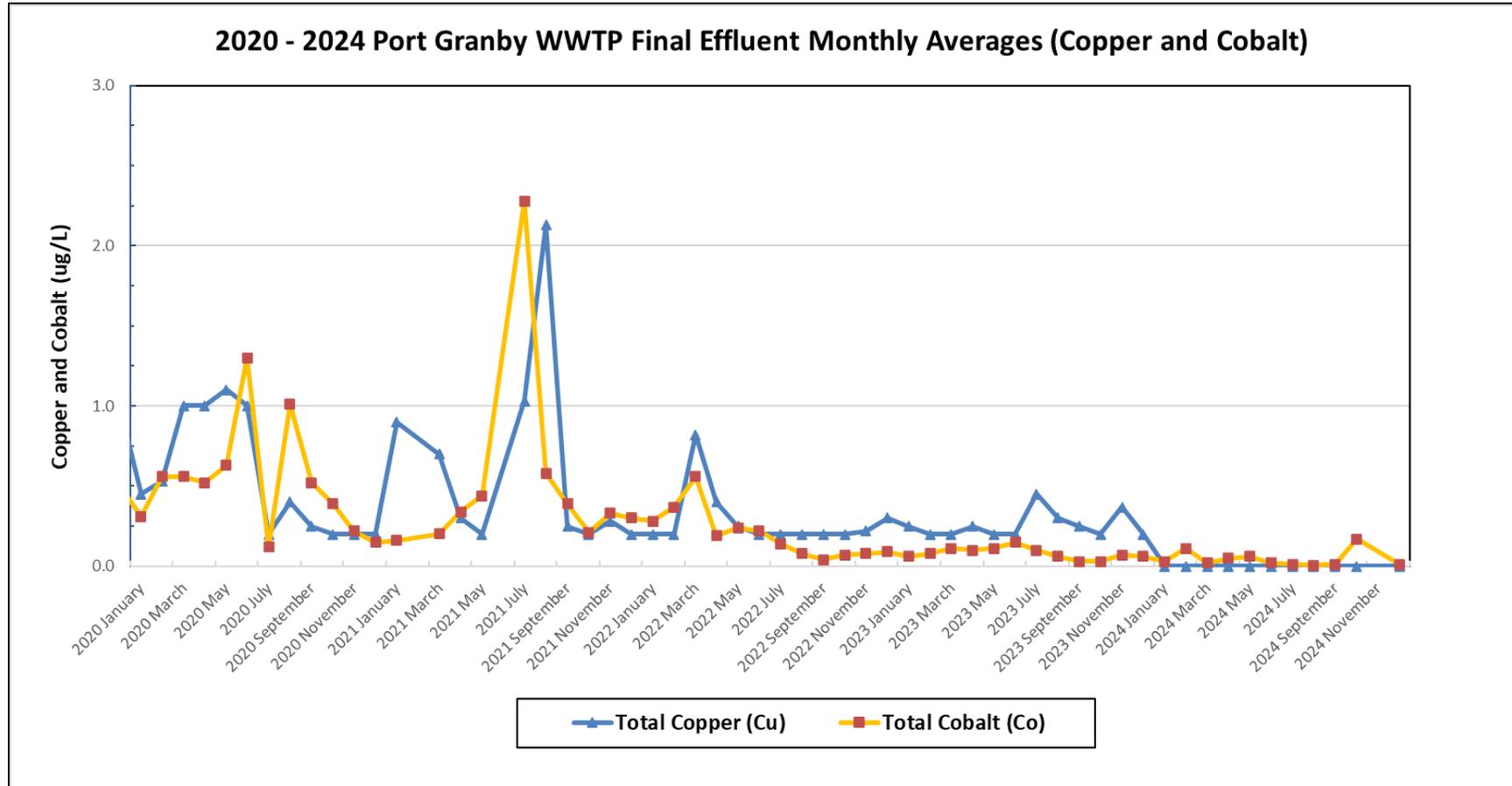


Figure 2: Port Granby Waste Water Treatment Plant Final Effluent Monthly Averages for Total Copper and Total Cobalt – Five-Year

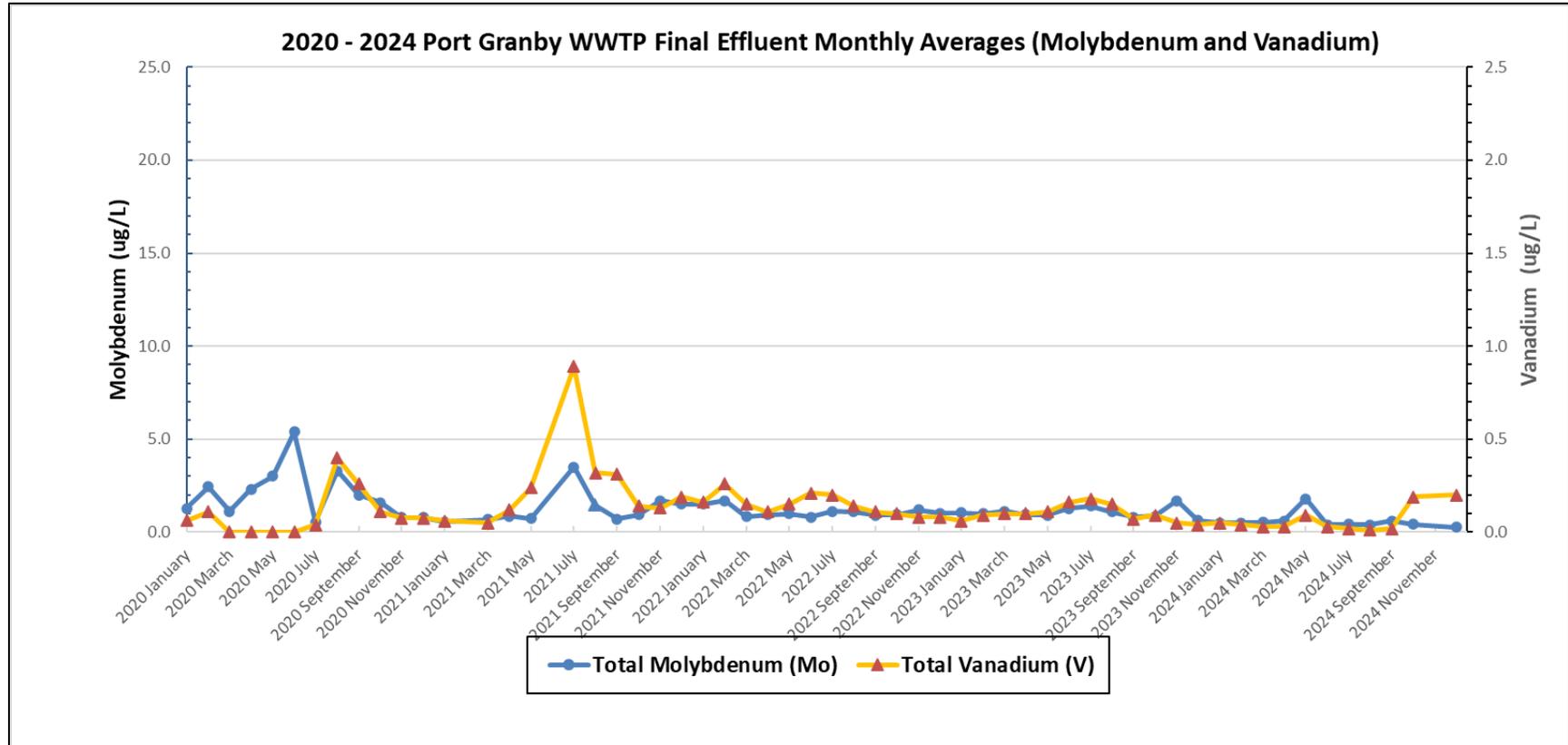


Figure 3: Port Granby Waste Water Treatment Plant Final Effluent Monthly Averages for Total Molybdenum and Total Vanadium – Five-Year

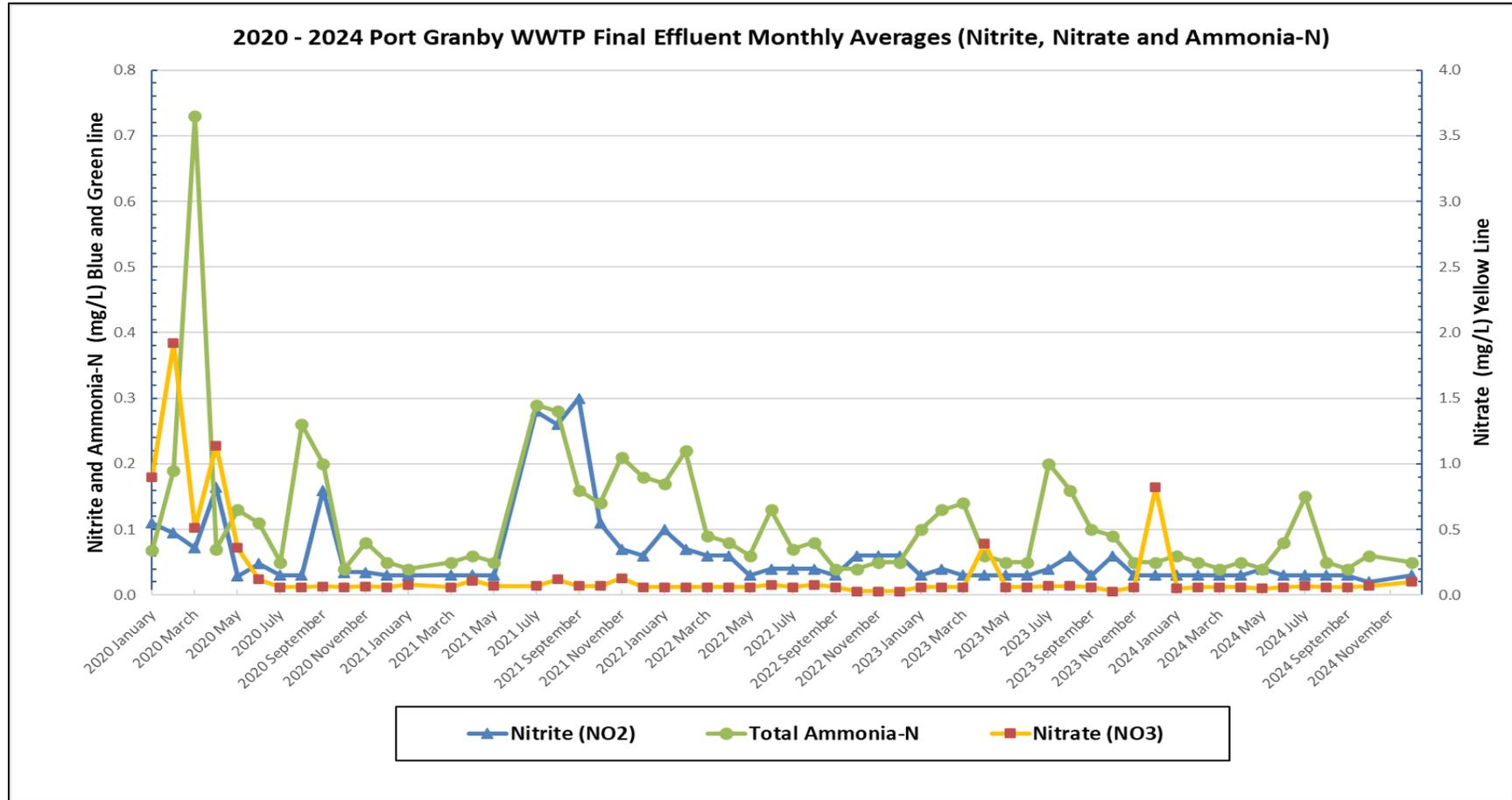


Figure 4: Port Granby Waste Water Treatment Plant Final Effluent Monthly Averages for Total Ammonia, Nitrate, and Nitrite – Five-Year

A.2 Port Hope Waste Water Treatment Plant Monitoring**Table 5: Port Hope Waste Water Treatment Plant – 2024 Liquid Influent Sampling**

Influent Parameter (unit of measure)	Maximum Value	Average Value
Radium-226 (Bq/L)	0.54	0.23
pH	9.56	8.77
Total Suspended Solids (mg/L)	130	34
Total Aluminum (µg/L)	1,779	465
Total Arsenic (µg/L)	419	177
Total Cadmium (µg/L)	0.60	0.27
Total Cobalt (µg/L)	500	223
Total Copper (µg/L)	93	33
Total Lead (µg/L)	211	85
Total Phosphorus (mg/L)	1.80	0.49
Total Uranium (µg/L)	788	481
Total Vanadium (µg/L)	12.2	6.5
Total Zinc (µg/L)	236	68
Note: Sampling frequency is weekly (as available).		

Table 6: Port Hope Waste Water Treatment Plant Production Quantities of Effluent – Five-Year

Month	2020 Effluent (m³)	2021 Effluent (m³)	2022 Effluent (m³)	2023 Effluent (m³)	2024 Effluent (m³)
January	19,382	15,554	7,218	22,855	10,275
February	22,856	3,870	11,096	15,957	12,058
March	22,756	15,329	22,104	13,986	15,349
April	18,656	14,488	18,676	22,211	19,599
May	8,221	4,254	12,319	9,614	6,052
June	3,735	0	3,936	0	4,944
July	7,600	7,130	2,953	10,967	12,418
August	10,621	6,381	6,963	8,139	9,053
September	3,927	9,089	4,384	10,529	9,024
October	9,591	20,642	2,931	3,755	5,059
November	4,183	15,581	0	7,793	5,973
December	8,689	12,656	9,735	6,081	5,178
TOTAL	140,216	124,973	102,316	131,889	114,982

Note: Some of the numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

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Table 7: Port Hope Waste Water Treatment Plant– 2024 Results of Liquid Effluent Sampling

Effluent Parameter (unit of measure)	Total No. of Samples ^a	Maximum Value	Mean Value	Action Level (weekly mean concentration composite sample)	Release Limit (weekly mean concentration composite sample)	Release Limit (monthly mean concentration composite sample)	No. of Samples Exceeding the Action Level	No. of Samples Exceeding the Release Limit
Acute Toxicity	12	PASS ^b	-	-	-	Cannot be toxic	-	0
Radium-226 (Bq/L)	48	0.01	<0.006	0.05	0.74	0.37	0	0
pH	48	7.75	7.29	6.5–8.5	6.0–9.0	6.0–9.0	0	0
Total Suspended Solids (mg/L)	48	4	<1.2	7.5	30	15	0	0
Total Aluminum (µg/L)	48	6	<1.7	55	220	110	0	0
Total Arsenic (µg/L)	48	3.3	<0.8	50	300	150	0	0
Total Cadmium (µg/L)	48	0.09	<0.005	0.14	0.34	0.17	0	0
Total Cobalt (µg/L)	48	0.58	<0.24	52	210	105	0	0
Total Copper (µg/L)	48	2	<0.36	7.5	30	15	0	0
Total Lead (µg/L)	48	0.5	<0.16	5	46	23	0	0
Total Phosphorus (mg/L)	48	0.1	<0.006	0.25	1	0.5	0	0

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Effluent Parameter (unit of measure)	Total No. of Samples ^a	Maximum Value	Mean Value	Action Level (weekly mean concentration composite sample)	Release Limit (weekly mean concentration composite sample)	Release Limit (monthly mean concentration composite sample)	No. of Samples Exceeding the Action Level	No. of Samples Exceeding the Release Limit
Total Uranium (µg/L)	48	0.48	0.21	55	300	150	0	0
Total Vanadium (µg/L)	48	0.5	<0.056	2.2	8.8	4.4	0	0
Total Zinc (µg/L)	48	5	<1.1	15	420	210	0	0

Notes:

Action levels and release limits for liquid effluent are defined in the *Port Hope Project Environmental and Biophysical Monitoring Plan* [8].

a. The total number of effluent samples is less than the total number of influent samples (Table 5) due to recirculation mode operations, where no releases were made.

b. Acute Toxicity is PASS/FAIL

< – Some or all results were below the minimum detection limit;

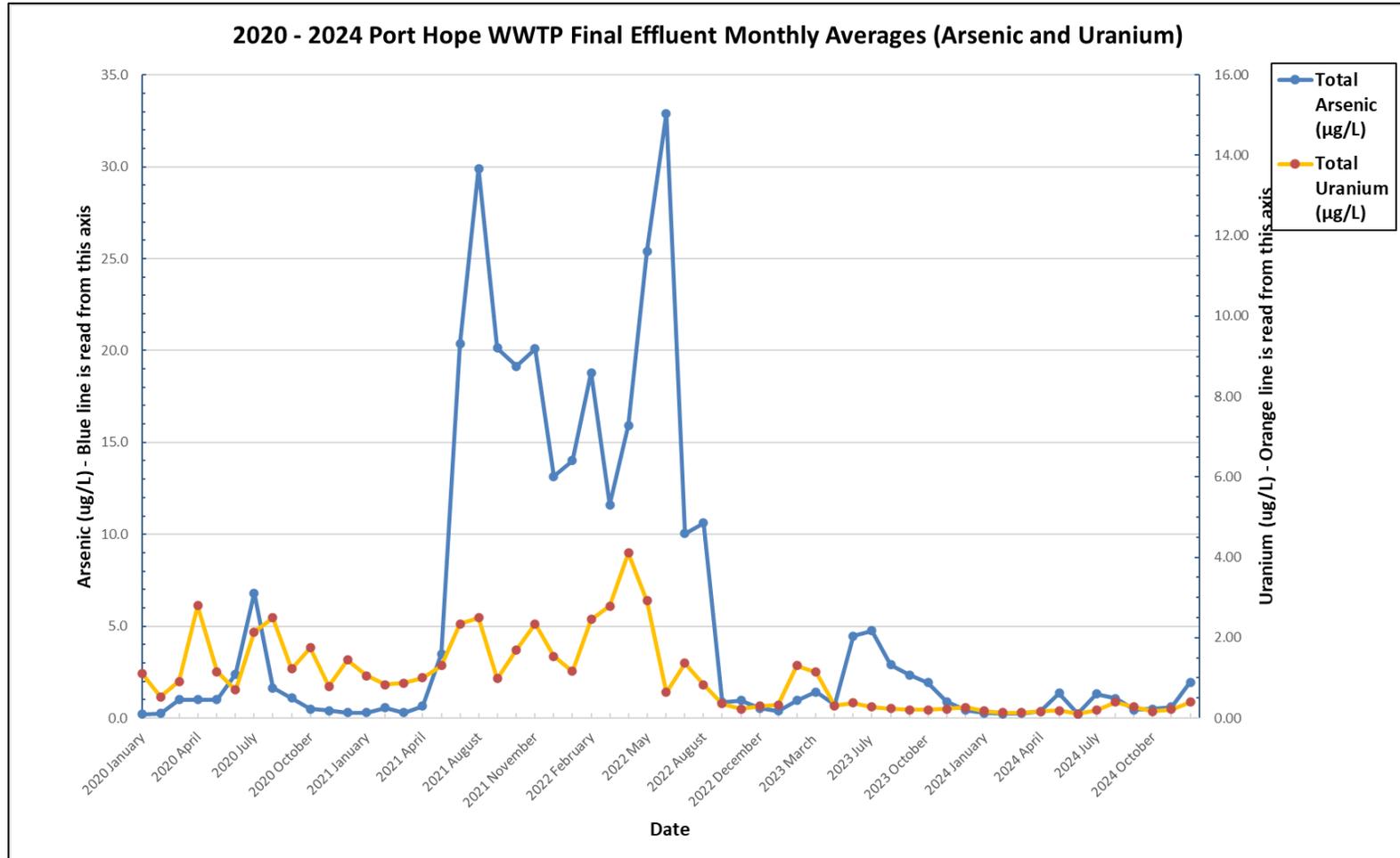


Figure 5: Port Hope Waste Water Treatment Plant Final Effluent Monthly Averages for Total Arsenic and Total Uranium – Five-Year

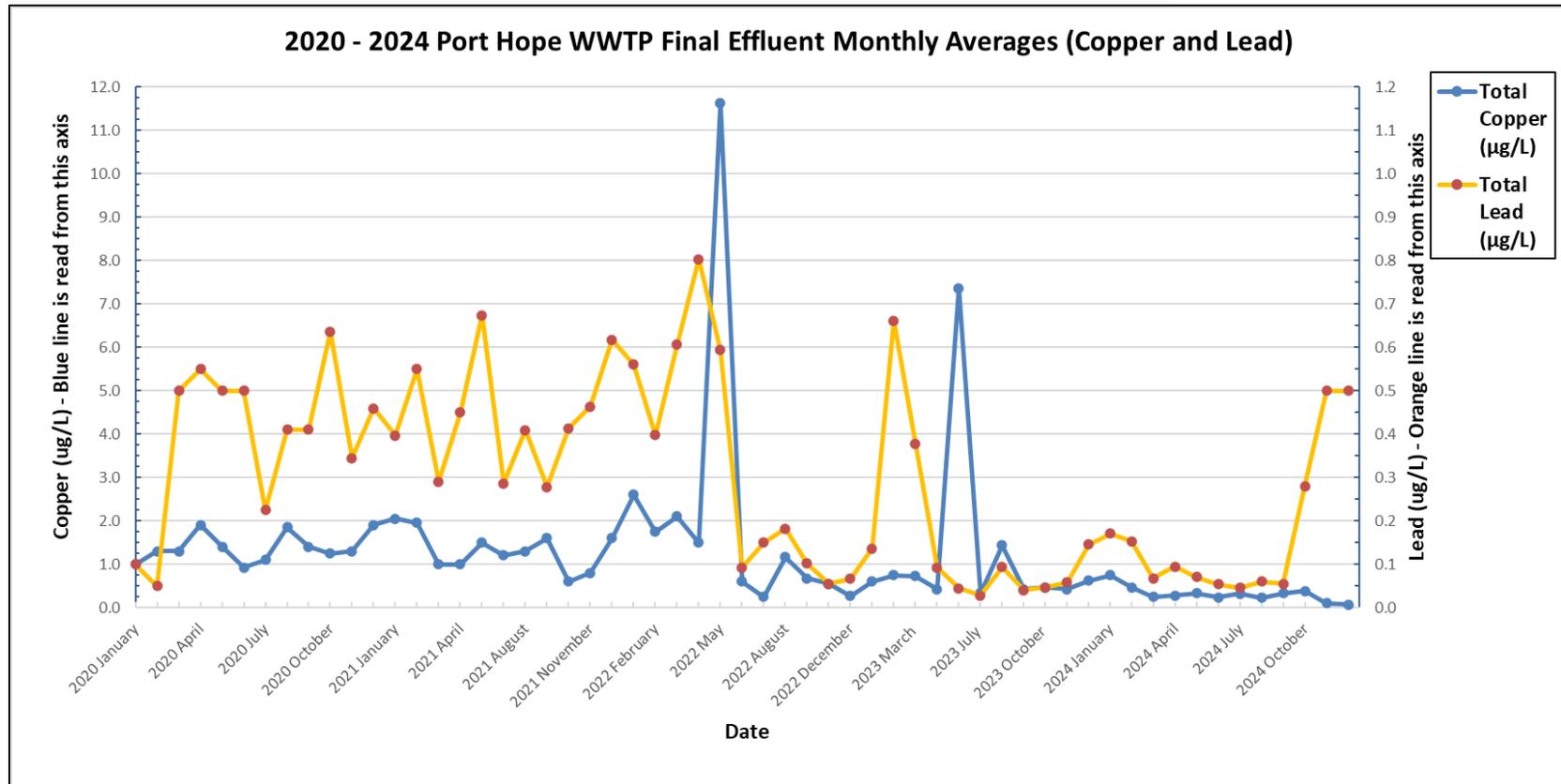


Figure 6: Port Hope Waste Water Treatment Plant Final Effluent Monthly Averages for Total Copper and Total Lead – Five-Year

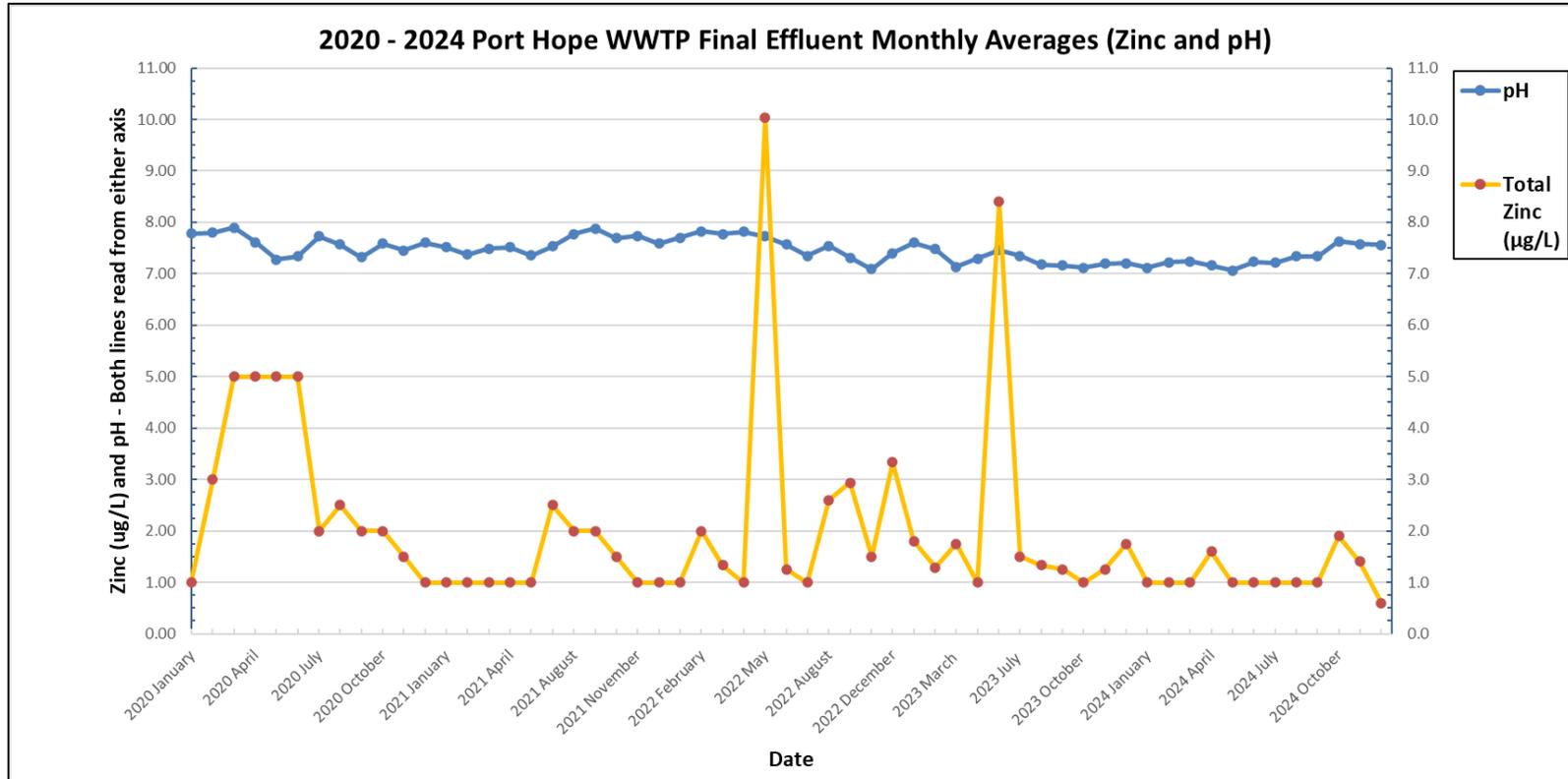


Figure 7: Port Hope Waste Water Treatment Plant Final Effluent Monthly Averages for Total Zinc and pH – Five-Year

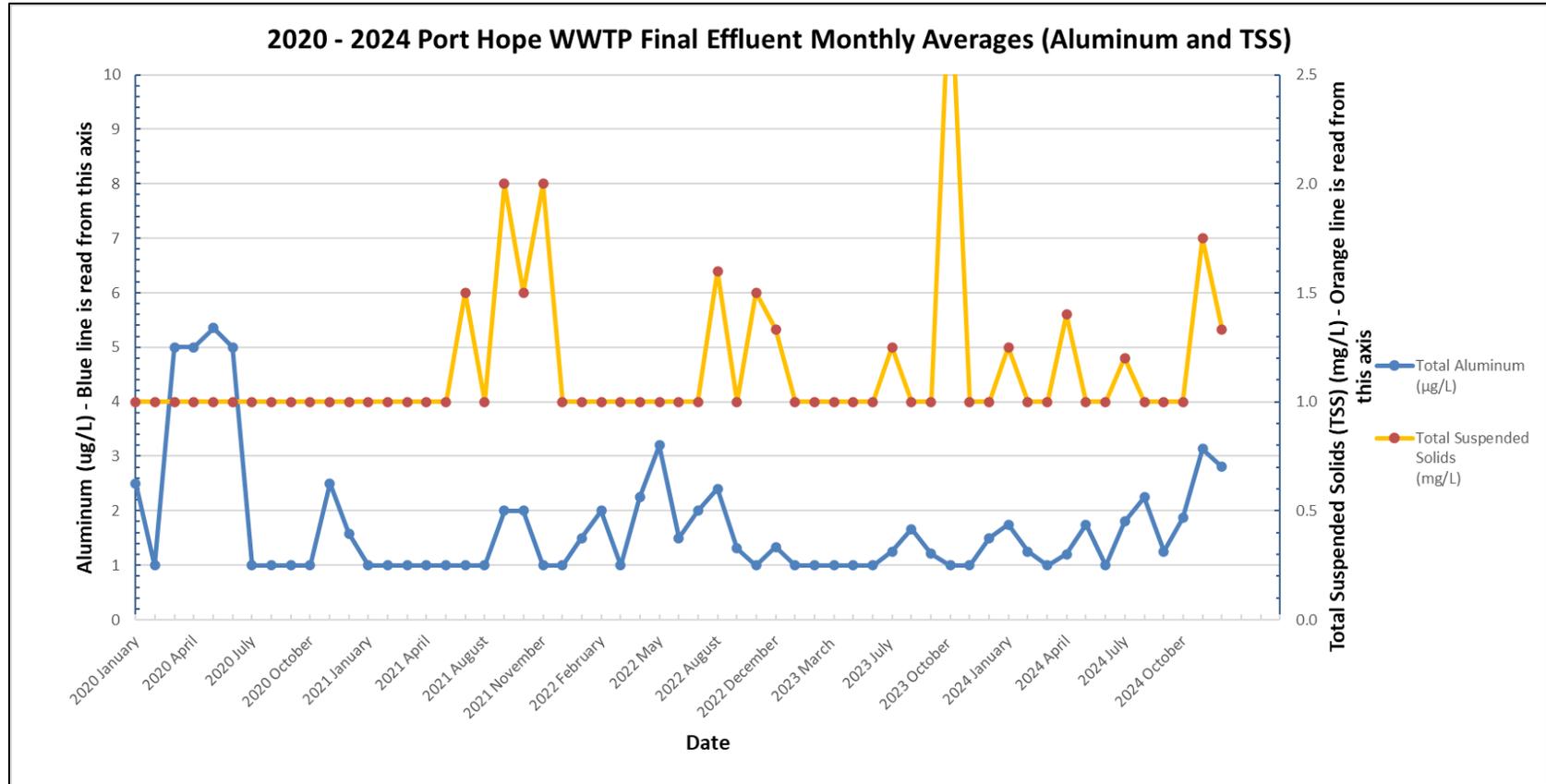


Figure 8: Port Hope Waste Water Treatment Plant Final Effluent Monthly Averages for Total Aluminum and Total Suspended Solids – Five-Year

Appendix B Operational Environmental Monitoring

B.1 Leachate Monitoring

Table 8: Port Granby Long-Term Waste Management Facility Leachate Volumes

Location	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Total (m ³)
PS-05	293	20	293	258	596	97	194	238	0	60	84	10	2,143
PS-06	237	38	272	408	351	152	152	269	265	208	303	95	2,750
Combined Total (m³)	530	58	565	666	947	249	346	507	265	268	387	105	4,893

Note: Some of the numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

B.2 Bluff Seepage Monitoring

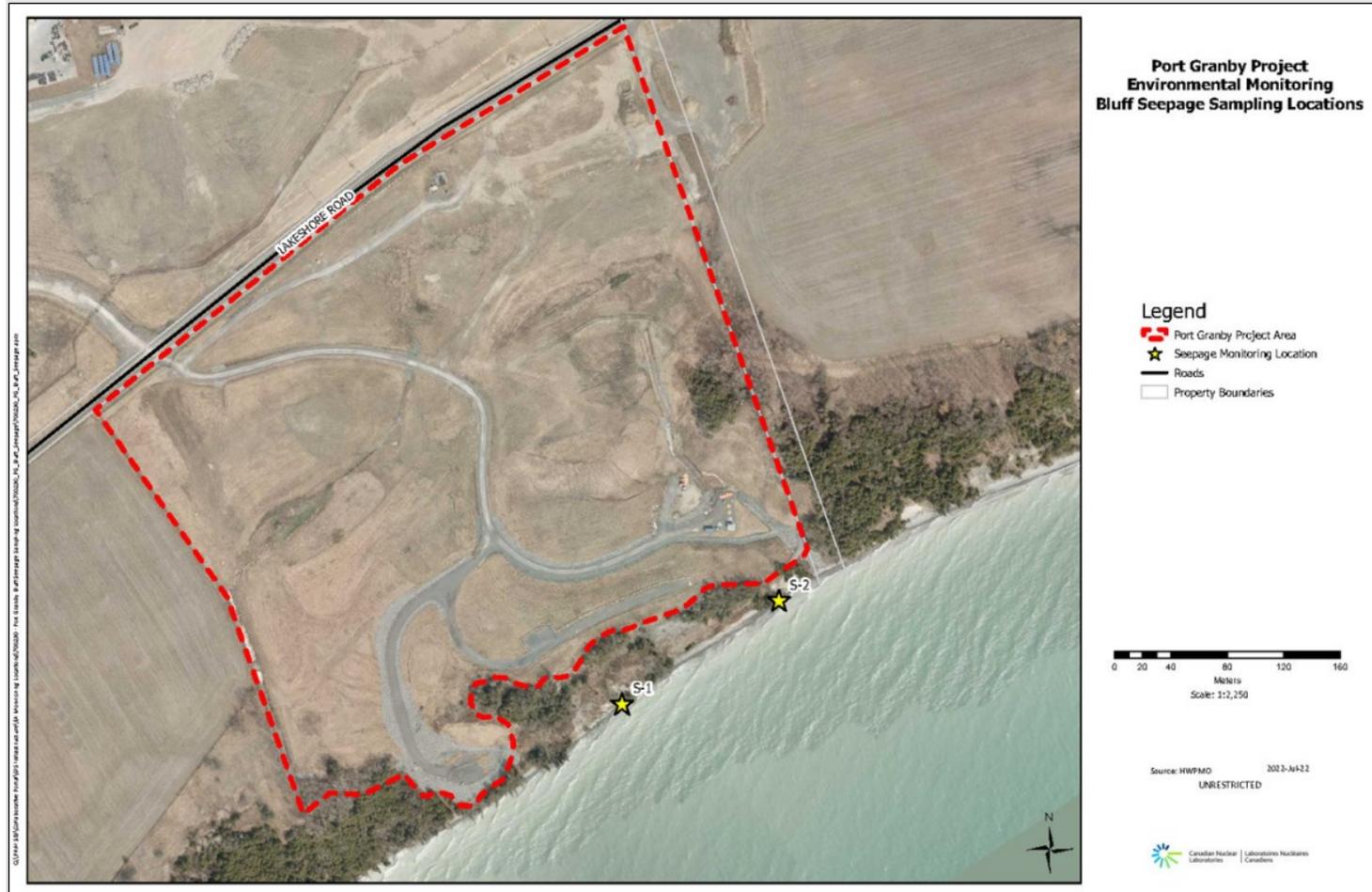


Figure 9: Port Granby Project Bluff Seepage Sampling Locations

Table 9: Port Granby Long-Term Waste Management Facility Bluff Seepage Water Quality (PG-S-1)

PG-S-1									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Arsenic (total)	µg/L	100	5	757	967	- ^a	- ^a	- ^a	- ^a
Uranium (total)	µg/L	5	15	178	278	- ^a	- ^a	- ^a	- ^a
Radium-226	Bq/L	1	-	0.14	0.55	- ^a	- ^a	- ^a	- ^a
Ammonia + Ammonium (N)	mg/L	-	-	20.4	26.0	- ^a	- ^a	- ^a	- ^a
Fluoride	mg/L	-	0.12	1.09	2.90	- ^a	- ^a	- ^a	- ^a
Nitrate (as N)	mg/L	-	13	194	227	- ^a	- ^a	- ^a	- ^a

Notes:
 2024 averages are based on quarterly (4) sampling results.
Bold values indicate an exceedance of criteria.
 a. Inaccessible due to water levels/bluff erosion
 < – indicates the result was less than the laboratory method detection limit;

Table 10: Port Granby Long-Term Waste Management Facility Bluff Seepage Water Quality (PG-S-2)

PG-S-2									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Arsenic (total)	µg/L	100	5	543	520	700	458	354	425
Uranium (total)	µg/L	5	15	124	131	82	78	58	71
Radium-226	Bq/L	1	-	0.01	0.02	< 0.01	0.02	0.01	< 0.02
Ammonia + Ammonium (N)	mg/L	-	-	0.060	0.053	0.050	0.053	< 0.05	< 0.05
Fluoride	mg/L	-	0.12	0.96	0.71	0.74	0.46	0.55	0.59
Nitrate (as N)	mg/L	-	13	2.10	2.97	1.71	2.84	1.57	2.91

Notes:
 2024 averages are based on quarterly (4) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

B.3 Sediment Monitoring

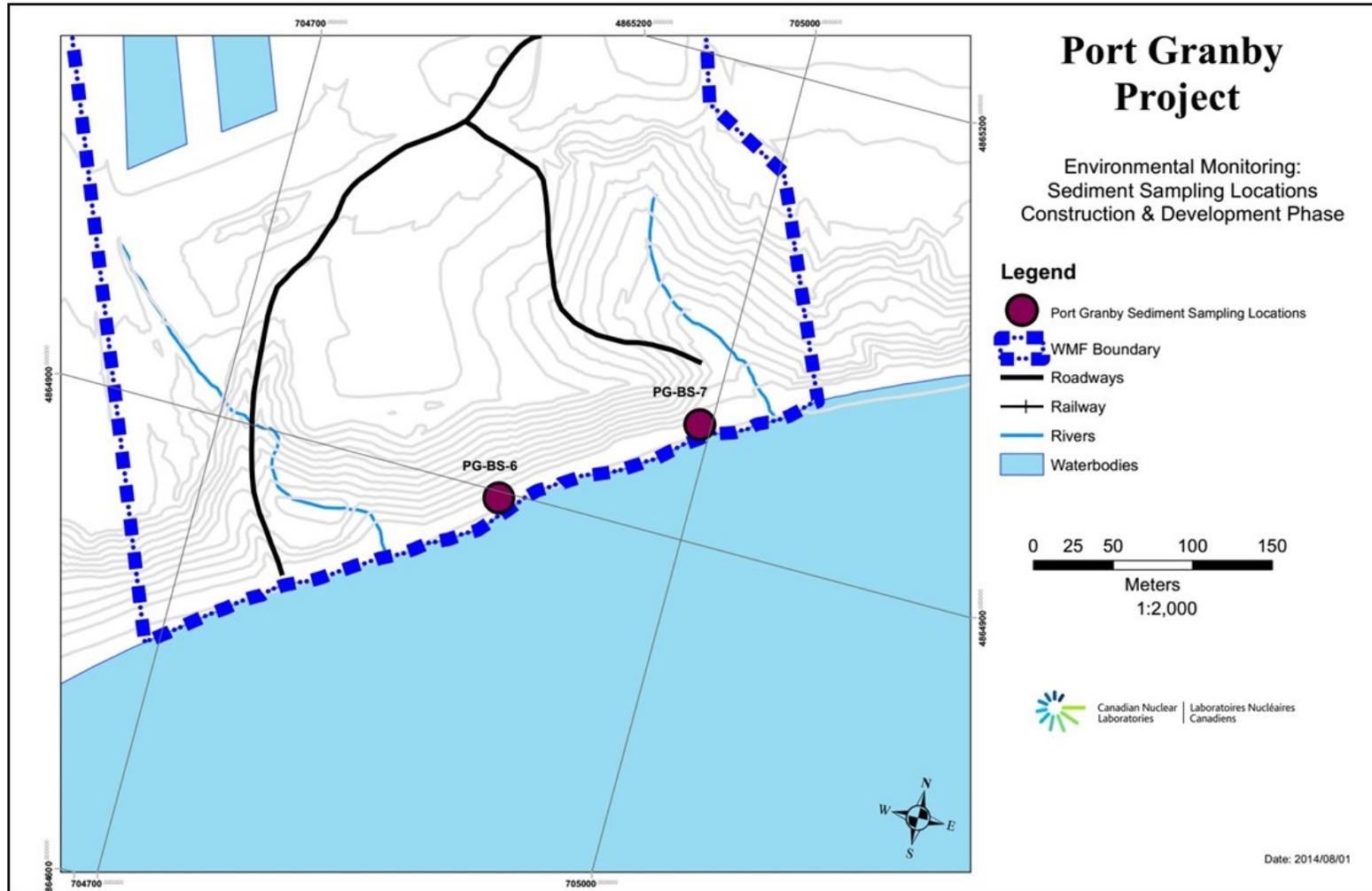


Figure 10: Port Granby Project Sediment Sampling Locations

Table 11: Port Granby Long-Term Waste Management Facility Sediment Quality – Location 1 (PG-BS-6)

PG-BS-6											
Parameter	Unit of Measure	Criteria				2020	2021	2022	2023	2024	
		PSQG [16]		CCME [17]		Average				Average	Maximum
		LEL	SEL	ISQG	PEL						
Primary COPC											
Antimony	µg/g	-	-	-	-	< 0.80	< 0.80	No sample ^a		< 0.80	< 0.80
Arsenic	µg/g	6	33	5.9	17	2.20	1.90			1.20	1.20
Cobalt	µg/g	-	-	-	-	2.4	2.4			0.7	0.7
Copper	µg/g	16	110	35.7	197	4.2	2.4			1.2	1.2
Lead	µg/g	31	250	35	91.3	2.00	1.65			0.60	0.60
Nickel	µg/g	16	75	-	-	4.15	3.00			1.20	1.2
Uranium	µg/g	-	-	-	-	2.12	1.15			0.35	0.35
Radium-226	Bq/g	-	-	-	-	0.12	0.08			< 0.02	< 0.02
Thorium-230	Bq/g	-	-	-	-	0.25	0.25			< 0.20	< 0.20
Thorium-232	Bq/g	-	-	-	-	0.01	0.06			0.01	0.01
Secondary COPC											
Barium	µg/g	-	-	-	-	29.5	15.2			6.8	6.8
Beryllium	µg/g	-	-	-	-	0.120	0.095			0.060	0.06
Boron (water soluble)	µg/g	-	-	-	-	< 1	< 1			< 1	< 1
Cadmium	µg/g	0.6	10	0.6	3.5	0.03	0.04			< 0.05	< 0.05
Mercury	µg/g	0.2	2	0.17	0.486	< 0.05	< 0.05			< 0.05	< 0.05
Molybdenum	µg/g	-	-	-	-	0.80	0.70			0.20	0.20

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PG-BS-6											
Parameter	Unit of Measure	Criteria				2020	2021	2022	2023	2024	
		PSQG [16]		CCME [17]		Average				Average	Maximum
		LEL	SEL	ISQG	PEL						
Selenium	µg/g	-	-	-	-	< 0.70	< 0.70			0.1	0.1
Silver	µg/g	-	-	-	-	< 0.05	< 0.05			< 0.05	< 0.05
Vanadium	µg/g	-	-	-	-	13	33			5	5
Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. a. Inaccessible due to water levels/bluff erosion. LEL – Lowest Effect Level; SEL – Severe Effect Level; ISQG – Interim Sediment Quality Guideline; PEL – Probable Effect Level; < – indicates the result was less than the laboratory method detection limit;											

Table 12: Port Granby Long-Term Waste Management Facility Sediment Quality – Location 2 (PG-BS-7)

PG-BS-7											
Parameter	Unit of Measure	Criteria				2020	2021	2022	2023	2024	
		PSQG [16]		CCME [17]		Average				Average	Maximum
		LEL	SEL	ISQG	PEL						
Primary COPC											
Antimony	µg/g	-	-	-	-	< 0.80	< 0.80	< 0.80	< 0.80	0.50	< 0.80
Arsenic	µg/g	6	33	5.9	17	11.80	18.85	14.00	26.30	8.00	8.10
Cobalt	µg/g	-	-	-	-	2.3	3.6	4.1	8.9	2.6	3.7
Copper	µg/g	16	110	35.7	197	4.3	2.0	5.2	2.7	2.7	3.5
Lead	µg/g	31	250	35	91.3	1.85	1.70	2.70	2.00	1.30	1.70
Nickel	µg/g	16	75	-	-	3.80	3.75	5.55	3.40	3.50	5.0
Uranium	µg/g	-	-	-	-	2.01	1.25	2.20	0.85	0.71	0.98
Radium-226	Bq/g	-	-	-	-	0.05	0.05	0.04	0.05	0.26	< 0.50
Thorium-230	Bq/g	-	-	-	-	0.15	< 0.20	< 0.20	0.10	0.60	< 1.00
Thorium-232	Bq/g	-	-	-	-	0.01	0.03	0.01	0.02	0.01	0.01
Secondary COPC											
Barium	µg/g	-	-	-	-	18.5	14.7	26.0	12.5	10.2	11.0
Beryllium	µg/g	-	-	-	-	0.130	0.085	0.560	0.110	0.135	< 0.20
Boron (water soluble)	µg/g	-	-	-	-	< 1	< 1	1	< 1	0.3	< 1
Cadmium	µg/g	0.6	10	0.6	3.5	0.03	0.04	0.06	< 0.05	0.08	< 0.10
Mercury	µg/g	0.2	2	0.17	0.486	< 0.05	< 0.05	< 0.05	< 0.05	0.05	< 0.05
Molybdenum	µg/g	-	-	-	-	0.60	0.30	0.70	0.45	0.35	< 0.50

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PG-BS-7											
Parameter	Unit of Measure	Criteria				2020	2021	2022	2023	2024	
		PSQG [16]		CCME [17]		Average				Average	Maximum
		LEL	SEL	ISQG	PEL						
Selenium	µg/g	-	-	-	-	< 0.70	< 0.70	< 0.70	0.15	0.3	< 0.5
Silver	µg/g	-	-	-	-	< 0.05	< 0.05	0.07	< 0.05	0.13	< 0.20
Vanadium	µg/g	-	-	-	-	12	32	13	18	22	39

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 LEL – Lowest Effect Level; SEL – Severe Effect Level; ISQG – Interim Sediment Quality Guideline; PEL – Probable Effect Level; < – indicates the result was less than the laboratory method detection limit;

B.4 Storm Water Management Monitoring

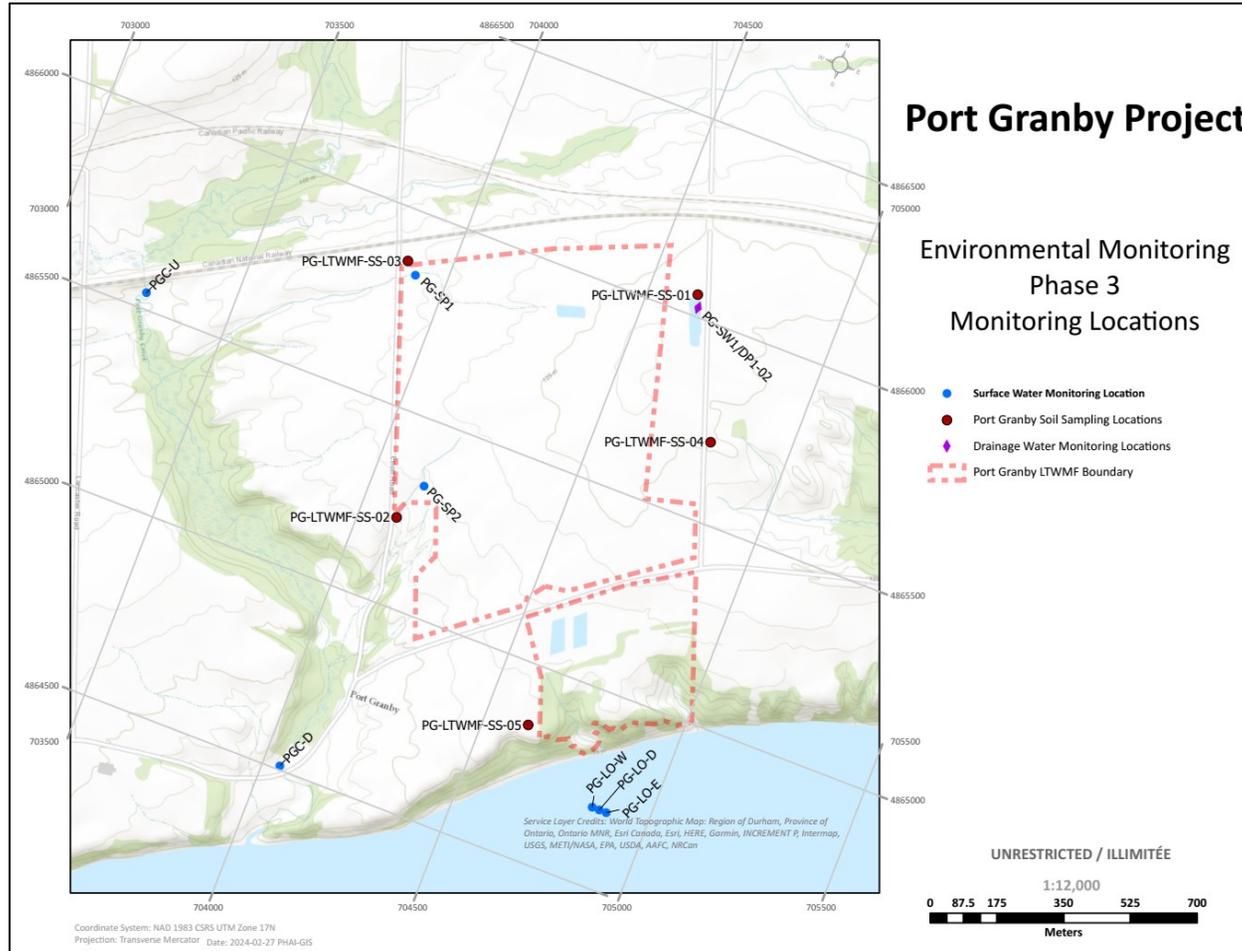


Figure 11: Port Granby Project Environmental Monitoring Locations

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Table 13: Port Granby Long-Term Waste Management Facility Surface Water Quality North Storm Water Pond – Location 1 (PG-SP1)

PG-SP1									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (total)	µg/L	100	5	3.45	5.35	3.38	2.71	2.84	6.40
Cobalt (total)	µg/L	0.90	-	0.58	0.31	0.30	0.15	0.25	< 0.50
Copper (total)	µg/L	5	-	2.28	1.51	1.30	0.82	1.06	< 2.0
Lead (total)	µg/L	5	7	0.52	0.33	0.27	0.22	0.24	< 0.50
Fluoride (F-)	mg/L		0.12	0.24	0.18	0.17	0.19	0.17	0.20
Nickel (total)	µg/L	25	25	1.23	0.72	0.75	0.43	0.53	< 1.0
Uranium (total)	µg/L	5	15	4.320	3.185	1.834	1.065	0.924	2.230
Radium-226	Bq/L	1	-	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	46.8	31.3	21.1	19.6	26.3	49.5
Beryllium (total)	µg/L	1,100	-	0.029	0.015	0.014	0.014	0.107	< 0.40
Boron (total)	µg/L	200	1,500	36	44	33	31	38	56
Cadmium (total)	µg/L	0.20	0.09	0.012	0.010	0.012	0.010	0.028	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	0.01	< 0.01	< 0.03	< 0.10
Molybdenum (total)	µg/L	40	73	2.35	1.68	1.37	0.89	0.71	< 1.90

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Selenium (total)	µg/L	100	1	0.16	0.15	0.16	0.11	0.58	< 2.0
Silver (total)	µg/L	0.10	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	2.01	1.29	1.35	1.02	0.53	< 0.97

Notes:

2024 averages are based on monthly (12) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 14: Port Granby Long-Term Waste Management Facility Surface Water Quality South Storm Water Pond – Location 2 (PG-SP2)

PG-SP2									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (total)	µg/L	100	5	17.57	22.33	6.61	2.33	1.38	2.10
Cobalt (total)	µg/L	0.90	-	0.63	0.84	0.32	0.13	0.19	< 0.50
Copper (total)	µg/L	5	-	0.99	0.86	0.68	0.55	1.06	< 2.0
Lead (total)	µg/L	5	7	0.30	0.32	0.12	0.21	0.23	< 0.50
Fluoride (F-)	mg/L		0.12	0.15	0.18	0.16	0.17	0.14	0.20
Nickel (total)	µg/L	25	25	3.24	3.27	1.42	0.62	0.61	< 1.0
Uranium (total)	µg/L	5	15	2.62	49.57	6.06	1.91	0.97	2.20
Radium-226	Bq/L	1	-	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	27.3	29.9	16.4	17.3	24.5	41.0
Beryllium (total)	µg/L	1,100	-	0.009	0.012	0.008	0.014	0.105	< 0.40
Boron (total)	µg/L	200	1,500	24	42	28	23	20	27
Cadmium (total)	µg/L	0.20	0.09	0.006	0.018	0.006	0.007	0.027	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (total)	µg/L	40	73	2.58	6.16	1.51	0.63	0.53	< 1.0
Selenium (total)	µg/L	100	1	0.05	0.07	0.07	0.07	0.55	< 2.0

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Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.42	0.69	0.39	0.69	0.38	< 0.75

Notes:

2024 averages are based on monthly (12) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

B.5 Groundwater Monitoring

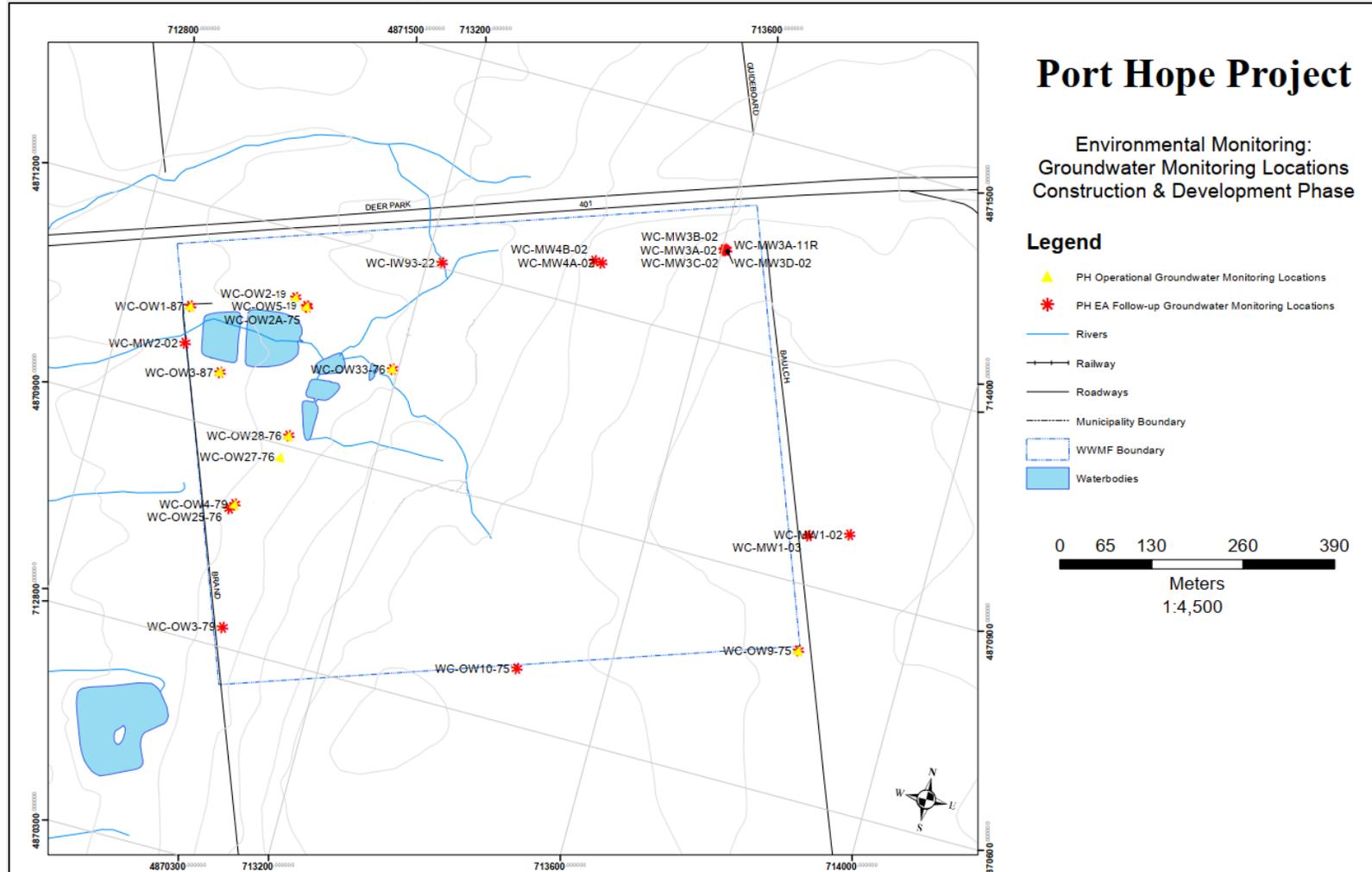


Figure 12: Port Hope Long-Term Waste Management Facility Groundwater Monitoring Well Locations

Table 15: Port Hope Long-Term Waste Management Facility Operational Observation Well Sampling Results

Observation Well Identifier	Arsenic (µg/L)						Uranium (µg/L)					
	2020	2021	2022	2023	2024		2020	2021	2022	2023	2024	
Upgradient	Average				Average	Maximum	Average				Average	Maximum
1-87	0.80	0.90	1.20	4.20	13.40	25.50	3.815	3.920	2.830	3.275	3.575	3.580
WC-OW2-19	1.50	1.75	1.25	0.40	1.55	1.60	0.132	0.101	0.089	6.210	0.088	0.096
3-87	5.05	5.00	5.70	5.65	5.15	5.50	0.153	0.683	0.088	0.077	0.116	0.123
WC-OW5-19	3.35	3.35	2.70	4.45	4.30	4.40	0.111	0.111	0.056	0.067	0.105	0.159
33-76	1.20	0.60	1.20	3.30	2.75	2.90	1.506	3.350	2.860	1.870	1.860	1.910
Downgradient												
4-79	0.65	0.80	0.60	0.45	0.60	1.00	0.089	0.082	0.085	0.212	0.105	0.110
27-76	0.35	0.35	0.35	0.35	0.65	1.00	0.145	0.128	0.133	0.131	0.113	0.125
28-76	0.60	0.50	0.50	0.35	0.85	1.00	0.166	0.190	0.178	0.161	0.186	0.210
WC-LTWMF-MF-06	1.25	1.50	1.80	1.65	1.10	1.10	0.330	0.942	0.864	1.062	1.150	1.250

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Observation Well Identifier	Radium-226 (Bq/L)						pH					
	2020	2021	2022	2023	2024		2020	2021	2022	2023	2024	
Upgradient	Average				Average	Maximum	Average				Average	Maximum
1-87	< 0.01	0.01	< 0.01	0.02	< 0.01	0.01	7.58	7.43	7.43	7.44	7.21	7.28
WC-OW2-19	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	7.66	7.42	7.58	7.45	7.70	7.76
3-87	0.01	0.01	< 0.01	< 0.01	< 0.01	0.01	7.99	7.87	7.86	7.80	7.96	8.04
WC-OW5-19	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	7.20	7.20	7.32	7.08	7.20	7.29
33-76	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	7.36	7.60	7.50	7.78	7.76	7.77
Downgradient												
4-79	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	7.99	7.66	7.65	7.65	7.79	7.79
27-76	0.01	< 0.01	0.01	0.02	< 0.01	< 0.01	7.81	7.62	7.57	7.63	7.80	7.86
28-76	0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.04	8.10	-	-	7.83	-	-
WC-LTWMF-MF-06	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	7.96	8.21	8.16	8.14	8.16	8.19

Notes:
 2024 averages are based on semi-annual (2) samples at each well.
 Bold values indicate an exceedance of criteria.
 Decommissioned well: 1-75, 2-75, 12-75, 18-76.
 Lost well: 36-76.
 -- no data.

Table 16: Port Hope Long-Term Waste Management Facility Sentinel Well Monitoring

PH LTWMF Sentinel Wells						
		Arsenic (dissolved)				
		2020	2021	2022	2023	2024
Criteria Trigger Level [8]		50 µg/L				
Observation/Sentinel Well Identifier		Average				Average
WC-IW93-22	µg/L	1.5	1.5	1.6	1.7	1.6
WC-OW1-87	µg/L	0.8	0.9	1.2	4.2	13.4
WC-OW2-19 ^a	µg/L	1.5	1.8	1.3	1.5	1.6
WC-OW2A-19 ^b	µg/L	0.6	0.7	0.4	0.4	0.6
WC-OW3-79	µg/L	3.8	3.7	4.0	3.4	3.3
WC-OW3-87	µg/L	5.1	5.0	5.7	5.7	5.2
WC-OW4-79	µg/L	0.7	0.8	0.6	0.5	<0.6
WC-OW5-19 ^c	µg/L	3.4	2.6	2.7	4.5	4.3
WC-OW25-76	µg/L	0.8	0.7	0.8	0.7	<0.8
WC-OW27-76	µg/L	0.4	0.4	0.4	0.4	<0.7
WC-OW28-76	µg/L	0.6	0.5	0.5	0.4	<0.9
WC-OW33-76	µg/L	1.2	0.6	1.2	3.3	2.8

Notes:
 2024 Averages are based on semi-annual (2) samples as available.
¹ a. WC-OW2-19 was installed in 2019 to replace WC-OW2-87.
 b. WC-OW2A-19 was installed in 2019 to replace WC-OW2A-75.
 c. WC-OW5-19 was installed in 2019 to replace WC-OW5-79.

Appendix C Environmental Effects Monitoring

Table 17: Port Granby Project Environmental Assessment Follow-Up Monitoring Plan Summary, 2024

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
Atmospheric Environment						
<p>Air Quality: For PM_{2.5} emissions, there will be occasional and slight exceedances along the edge of the existing WMF site. Development Phase of the LTWMF.</p>	Implementation of a high level of dust control measures at waste site.	No residual adverse effects.	The PHAI Dust Management and Requirements Plan [9] was followed during Phase 2 activities. Phase 2 ended in 2022 December.	Perform dust monitoring (TSP and PM _{2.5}) at sites adjacent to construction activities during the Construction and Development Phase. The proponent should use recent/up-to-date data to establish baseline conditions.	The PHAI Dust Management and Requirements Plan [9] was followed during Phase 2 activities. Phase 2 ended in 2022 December.	The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Dust monitoring (TSP and PM _{2.5}) was not required as outlined in the PHAI Dust Management and Requirements Plan [9].
<p>Noise: Levels will increase by 6 to 56 dBA at both the LTWMF and the existing facility in predicted zones of maximum influence as worst-case scenarios. There will be nuisance noise impacts on local receptors.</p>	<ol style="list-style-type: none"> Construction equipment will comply with emission standards as outlined in Noise Pollution Control -115 of the Ontario Model Municipal Noise Control By-Law. Trucks and other equipment will be equipped with mufflers. Tailgate banging will be avoided. Empty trucks will be required to reduce speed at construction sites and on local roads to avoid excessive cargo box and tray noise. Construction hoarding will be erected where practicable. All construction activities will be limited to daylight hours. 	No likely residual adverse effects.	Phase 2 ended in 2022 December. The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Noise monitoring was not required as outlined in the PGP Environmental and Biophysical Monitoring Plan [6].	Verify implementation of mitigation measures. Periodically measure noise levels at receptor locations near the Site Study Area during the Construction and Development Phase.	The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Noise monitoring was not required as outlined in the PGP Environmental and Biophysical Monitoring Plan [6].	The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Noise monitoring was not required as outlined in the PGP Environmental and Biophysical Monitoring Plan [6].
<p>Radiological Effects, Radon: The highest predicted annual average radon concentration is 5.1 Bq/m³ during construction and development.</p>	<ol style="list-style-type: none"> Working areas containing contaminated materials will be minimized. Application of dust suppressants including water and possibly chemical suppressants. Covering of stockpiles and exposed areas overnight and on weekends using foam agents, geotextiles, or other appropriate materials. Placing wind fencing around exposed stockpiles. Possible cessation of activities 	No residual adverse effects.	Mitigation measures were executed as outlined in the "Mitigation Measures" column.	Verify implementation of mitigation measures at time appropriate to the measure. Perform radon and long-lived alpha (LLA) monitoring during the Construction and Development Phase and monitoring during Early Life.	LLA and radon monitoring were being performed by the contractor, on a routine basis under their approved Dust Plan and Radiation Protection Plan during Phase 2. In 2024, CNL continued to perform monthly radon monitoring, and kept the total number of monitoring locations at the PG LTWMF and PG WMF to 15, 6 to monitor the capped engineered containment system. The average annual radon concentration measured at these locations was	Radon gas was monitored on a routine monthly basis at the former PG WMF and LTMWF during the 2024 calendar year.

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
	under high wind conditions. 6. Mulching or re-vegetating completed cells and excavation areas as soon as possible.				129 Bq/m ³ . The trigger level for radon monitoring is 150 Bq/m ³ .	
Radiological Effects, Particulate Radioactivity: The maximum predicted annual concentrations for the radionuclides are below the Health Canada reference values.	No additional mitigation measures. <i>(See mitigation measures for Atmospheric Environment – Radiological Effects, Radon.)</i>	No likely residual adverse effects.	The PHAI Dust Management and Requirements Plan [9] was followed during Phase 2 activities. Phase 2 ended in 2022 December.	Measure levels of radionuclides to verify modelling predictions.	The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Particulate radionuclide monitoring was not required as outlined in the PHAI Dust Management and Requirements Plan [9].	The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Dust monitoring (TSP and PM _{2.5}) was not required as outlined in the PHAI Dust Management and Requirements Plan [9].
Aquatic Environment						
Sediment Quality, Non-Radiological Effects: Improvement to sediment quality by a decreasing contaminant transport. Environmental media sampling will be collected along the Lake Ontario shoreline to evaluate efficacy of mitigation measures intended to control offsite mitigation of contaminated wastes during excavation.	Prompt removal of excavation water after rainfall along Lake Ontario shoreline, if remediation necessary. Fuel oil spilled to the Port Granby Creek will be cleaned by high pressure washing of cobble and gravel.	No likely residual adverse effects.	In 2024, there were no fuel spills or sedimentation events that took place.	In case of a sedimentation event or spill to Port Granby Creek, establish a post-cleanup monitoring plan during the Construction and Development Phase and the Maintenance and Monitoring Phase. Collect environmental media samples along the Lake Ontario shoreline to evaluate efficacy of mitigation measures intended to control off-site migration of contaminated wastes during excavation.	No residual adverse effects.	There was no sedimentation event that entered Port Granby Creek in 2024. Sediment monitoring along the Lake Ontario shoreline is performed twice per year (Section 1.2.1.5).
Surface Water Quality, Non-Radiological and Radiological Effects: Long-term improvement to down-gradient surface water quality, reduced contaminant loading to down-gradient lake, and no measurable change to Port Granby Creek.	Groundwater, storm water, and drainage water collection and treatment systems, including flow control and quality control, will be in place.	Beneficial long-term effects.	Construction of the PG LTWMF for the treatment and control of groundwater is complete. Active commissioning commenced in 2016 April.	Conduct additional background data collection, field data collection and analysis, and benchtop testing necessary to finalize the preferred treatment technology. Verify predicted improvements in surface water at existing and new water treatment system once the preferred treatment technology has been established. Compare the effluent quality performance with the predicted performance for the preferred technology. Proponent must ensure that discharge is not deleterious to the aquatic environment at the point of discharge. This must be	No residual adverse effects. Based on the predicted effluent concentrations from the pilot-scale work, effluent parameters at the new WWTP are less than what was predicted during the pilot-scale test work. However, influent concentrations are also currently less than what was predicted. Actual removal efficiencies (comparing influent to effluent numbers), for elements where there is a reasonable detectable quantity, indicate that removal efficiencies are	Preferred treatment technology was evaluated in 2011 through the <i>Water Treatment Definition – Port Granby Project</i> . Toxicity testing was conducted monthly (Section 1.1.1.1). Effluent quality at the WWTP was measured in 2016 April once the plant was commissioned, based on the design objectives in the PHAI Licence Conditions Handbook [4]. Approved release limits [6] have been implemented at the PG WWTP and updated in the PGP quarterly effluent reports. Groundwater seepage samples from the

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
				confirmed through appropriate monitoring and toxicity testing. Verify reduction of contaminant loadings due to leachate discharging to Lake Ontario via site groundwater seepage sampling program and, in cases where seep locations are adjacent to Lake Ontario, an accompanying mixing zone surface water sampling program.	>99% for most licensed parameters or design objectives. This is as expected from the pilot-scale test work.	bluffs are collected quarterly (Section 1.2.1.4).
Geology and Groundwater Environment						
Soil Quality, Radiological Effects: The mean incremental concentrations of radiological contaminants are expected to be less than 20% of background. The exception is thorium-230, with an expected 38% increase in concentration over baseline, during Construction and Development Phase of the LTWMF.	(See mitigation measures included in the Atmospheric and Terrestrial Environment components of the Environmental Assessment Study Report.)	No likely residual adverse effects.	The PHAI Dust Management and Requirements Plan [9] was followed during Phase 2 activities. Phase 2 ended in 2022 December.	Monitor soil quality in all project phases as described for the Terrestrial Environment component.	No residual adverse effects. Thorium-230 soil concentrations in 2024 have remained consistent with baseline data and monitoring data from previous years.	Soil samples are collected at perimeter locations annually (Section 0).
Groundwater Quality, Non-Radiological and Radiological Effects: Volume of groundwater collected for treatment in the LTWMF site groundwater and drainage water collection system would decrease by approximately 75%; contaminant concentration expected to decline over time.	Collected groundwater will be treated to requirements set by the CNSC during licensing of the LTWMF.	No residual adverse effects.	Construction of WWTP for the treatment and control of groundwater is complete. Active commissioning occurred in 2016 April.	Measure volume and concentrations of contaminants in groundwater samples at selected monitoring wells; additional wells near the LTWMF may be required. Revise the groundwater flow model by incorporating additional post-EA data collection results and used to verify EA predictions.	No residual adverse effects. Contaminant concentrations in groundwater at the former PG WMF are expected to decline as remediation progresses and natural attenuation occurs.	Groundwater was sampled and analyzed quarterly in 2024. The monitoring data for each well are presented in Appendix C.2. On the site of the LTWMF, changes to groundwater quality are expected to be minimal due to the presence of a containment system made from several barriers and water collection system. Sentinel monitoring will be used at the site perimeter locations to confirm effectiveness of containment system (Section 1.3.3.1).
Groundwater Flow: Groundwater discharge to Port Granby Creek is predicted to decrease by 1.6% due to operation of the engineered leachate containment system.	No mitigation measures necessary.	No residual adverse effects.	No mitigation measures necessary.	Measure groundwater levels at an expanded network of groundwater monitoring wells to confirm that sufficient monitors are distributed in each hydro stratigraphic unit, both vertically and horizontally, to properly define groundwater flow.	No residual adverse effects.	Groundwater levels are measured quarterly at the current groundwater network (Section 1.3.3.1). Wells that were decommissioned in 2016 were completed as per Ontario Regulation 903.

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
				<p>Measure groundwater levels at monitoring wells four times yearly during Construction and Development Phase, and annually during Early, Mid, and Late Life phases.</p> <p>Prior to the beginning of the construction, a number of monitoring wells will require proper abandonment in accordance with Ontario Regulation 903.</p>		
<p>Groundwater: No measurable changes in quality or quantity of groundwater and drainage water during LTWMF construction.</p>	<p>No mitigation measures necessary.</p>	<p>No residual adverse effects.</p>	<p>No mitigation measures necessary.</p>	<p>Monitor quantity and quality of groundwater and drainage water intercepted during construction to confirm predictions of no measurable change.</p> <p>Continue monitoring of the existing PG WMF as long as required based on evaluated contaminant concentrations, including bluff seepage. Monitoring is to be undertaken downgradient of the current PG WMF and in the East and West gorges.</p>	<p>No residual adverse effects.</p>	<p>Groundwater samples are collected quarterly at perimeter locations of the LTWMF (Section 1.3.3.1).</p> <p>Sampling of the bluff seepage is performed quarterly (Section 1.2.1.4)</p>
<p>Design of LTWMF, including liner and cover: Clay liner unit would have maximum hydraulic conductivity of 1×10^{-7} cm/s. Cover would have a maximum hydraulic conductivity of 1×10^{-7} cm/s. Volume of leachate generated within the LTWMF is predicted to be 100 m³/yr based on the assumption of 1 mm/a leakage through the cover. Volumes of excavated wastes to be stored in the LTWMF are predicted to be as follows: 204,400 m³ of LLRW and 101,000 m³ of marginally contaminated soils.</p>	<p>No mitigation measures necessary.</p>	<p>No residual adverse effects.</p>	<p>No mitigation measures necessary.</p>	<p>Monitor leakage through the liner system to verify hydraulic conductivity of the liner unit.</p> <p>Monitor settlement of the LTWMF cover to confirm the assumption that there will not be excessive settlements of the waste under the cover that would compromise the cover performance.</p> <p>Monitor rate of infiltration through the LTWMF cover to verify the hydraulic conductivity of the cover and to confirm the assumed leakage rate through the cover system.</p>	<p>No residual adverse effects.</p>	<p>Leakage monitoring is in progress and is performed monthly using the SuperSting EC Measurement Device (Section 1.2.1.2).</p> <p>Settlement monitoring is being conducted using photographs from various angles for comparison over time.</p> <p>The fate of infiltration will be estimated once the volume of pumped leachate stabilizes following dewatering on the waste in the mound.</p> <p>Monitoring of volume of excavated waste was performed when active waste removal commenced in 2016 November. Radioactivity levels were monitored</p>

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
				<p>Verify the volume and concentration of excavated waste prior to emplacement in the LTWMF to confirm the source term volumes and contaminant concentrations used to predict long-term environmental effects.</p>		<p>through the vehicle portal monitor before emplacement in the LTWMF.</p>
Terrestrial Environment						
<p>Preparation of the LTWMF site will result in temporary loss of vegetation of 2.2% in the Local Study Area and 6% in the Site Study Area, with permanent conversion of vegetation communities in 6.1% of Local Study Area and 15.3% of Site Study Area.</p>	<p>Relocation of the LTWMF storm water management pond out of the cultural thicket and into an agricultural field.</p> <p>Development of site-specific landscape plan by a qualified landscape architect or biologist for terrestrial environment at each work site.</p> <p>Development of new vegetation communities at the LTWMF site rather than simply re-creating pre-construction conditions.</p> <p>Development of a Protection and Rehabilitation Plan for the fen vegetation near the East Gorge.</p>	<p>No residual adverse effects.</p>	<p>The existing pond located to the east of the LTWMF was removed in 2016 as part of the site preparation work and has been replaced with the new north storm water management pond.</p> <p>Development of a site-specific Landscape plan is completed, and vegetation planting commenced in 2022.</p> <p>Hydroseeding and tree planting commenced in 2022 fall. Monitoring of the vegetation continued in 2024.</p> <p>The development of a protection and rehabilitation plan for the fen vegetation near the East Gorge was completed [31]</p>	<p>Verify relocation of storm water management pond.</p> <p>Verify development of protection and rehabilitation plans for the fen vegetation near the East Gorge.</p> <p>Verify implementation of erosion and sediment control structures, application of dust suppression techniques, and rehabilitation of sites.</p> <p>Monitor radiological and non-radiological COPCs in surficial soil during Construction and Development Phase and Early Life Maintenance and Monitoring Phase.</p> <p>Verify extent and duration of temporary and permanent vegetation loss/change.</p>	<p>No residual adverse effects.</p>	<p>The existing storm water management pond was relocated in 2016.</p> <p>The development of a protection and rehabilitation plan for the fen vegetation near the East Gorge was completed [31].</p> <p>Soil samples are collected at perimeter locations annually (Section 0).</p> <p>The extent of vegetation loss/change will be evaluated in Phase 3.</p>
Human Health and Safety – Workers: Non-Radiological Effects						
<p>Particulate matter is not predicted to have a measurable effect on workers' health.</p> <p>For construction activities – estimations predict a total of 4.6 lost time accidents and 15.3 recordable accidents.</p> <p>Noise level would reach 93 to 95 dBA within 15 m of the LTWMF and existing PG WMF.</p>	<p>Use of personal protection equipment such as dust masks and respirators to reduce the exposure to arsenic.</p> <p>Personal protection equipment to mitigate noise, if necessary.</p> <p>Adopt a policy that all occupational illnesses and injuries are preventable and</p>	<p>No residual adverse effects.</p>	<p>Independent construction contractor work sites will be required to adhere to provincial legislation related to the protection of health and safety. Contractors that support the CNL operated and led activities will fall under CNL programs and federal regulations. Compliance monitoring by CNL will occur during the active construction period.</p>	<p>Monitor compliance with federal legislation related to protection of health and safety.</p> <p>Monitor accident rate.</p>	<p>For construction activities, there were no recordable accidents at the PG LTWMF in 2024 and no lost time. Further details are provided in PHAI Waste Management Project Annual Compliance Report for 2024 [2].</p>	<p>Construction contractors are required to adhere to federal and provincial legislation related to the protection of health and safety. Compliance monitoring by CNL will occur during the active construction period.</p> <p>If accidents occur, accident reports and causes are reviewed with the contractors to ensure that appropriate measures are in place to reduce the possibility of recurrence.</p>

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
	<p>formally establish the objective of zero-time occupational illnesses and injuries.</p> <p>Develop and implement a formal Health and Safety Program.</p>		<p>Accident rate is being monitored [2].</p> <p>CNL reviewed and approved contractor plans for the Health and Safety Program.</p>			<p>PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Noise monitoring was not required as outlined in the PGP Environmental and Biophysical Monitoring Plan [6].</p>
<p>Human Health and Safety – Members of the Public: Non-Radiological Effects</p>						
<p>1. Air Quality and Noise:</p> <p>2. Non-radiological contaminants: Risk assessment on non-radiological contaminants predicted that any incremental risks associated with the Project would not pose an unreasonable risk to human health.</p> <p>3. General health and well-being: Reduced feelings of health and sense of wellbeing, feelings of personal security, and feelings of satisfaction with living in the community.</p>	<p><i>(See Atmospheric Environment Component.)</i></p> <p>Evaluation of the appropriateness of mitigation measures to prevent or minimize the potential public exposure to the effluents in the portion of Lake Ontario that may be affected by treated effluent or bluff seepage if needed.</p> <p>Continued and consistent protocols for delivering information and receiving input to/from residents in the Local and Regional Study Areas.</p>	<p>No likely residual adverse effects.</p> <p>Some residual adverse effects predicted. However, these are considered to be minor.</p>	<p>Effluent sampling takes place on a weekly schedule from the PG WWTP (Section 1.1.1.1).</p> <p>Bluff seepage sampling takes place quarterly (Section 1.2.1.4). It is noted that there are elevated levels, arsenic, and uranium in the seepage water that are above the Ontario PWQO [13] and the CCME CWQG [15]; however, the total contaminant plume to Lake Ontario remains small. The majority of the plume is estimated to have contaminant concentrations equivalent to 1% of the original concentration observed in the bluff seepage samples.</p> <p>In Phase 3, no visible work is being conducted at the LTWMF and minimal traffic in and out of the site is anticipated.</p> <p>CNL staff remain available to respond to and communicate regarding any emergency situations and to address any questions or concerns from stakeholders and the public. A summary of the communications and outreach activities related to the PGP is presented in the PHAI Waste Management Project Annual Compliance Report for 2024 [2]. The Complaints Resolution Program was regularly</p>	<p>Monitor communication protocols. Survey members of the public to confirm the level of satisfaction within the community. <i>(See Aquatic Environment Components.)</i> Monitor complaints resolution process.</p>	<p>No residual adverse effects.</p>	<p>The last public attitude survey was completed during 2022. Additional surveys are not anticipated during Phase 3 [2]. The Complaints Resolution Program is being regularly monitored [2].</p>

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
			monitored in 2024 as discussed in the annual compliance report [2].			
Human Health and Safety – Workers: Radiological Effects						
<p>Annual radiation doses are predicted to range between 2.1 and 7.1 mSv/a.</p> <p>During the Maintenance and Monitoring Phase, doses are predicted to be around 0.1 mSv/a.</p>	<p>Application of the As Low As Reasonably Achievable (ALARA) principle.</p> <p>No additional proposed mitigation.</p>	No residual adverse effects.	The Radiation Protection Program was implemented effectively to ensure doses to the public are ALARA and are below the limited predicted effects.	Monitor radiation doses to confirm accuracy of predictions.	For the PHAI, the individual annual doses ranged from 0.00 to 0.4 mSv/a. The collective radiation dose was 18.57 person-mSv. The average annual dose was 0.01 mSv/a.	Upon comparison between the actual and predicted doses, the doses exposed to the workers are generally below the predicted levels. These dose levels prove that the mitigation measures were effectively executed and reflect the fact that the engineered containment system has been capped.
Human Health and Safety – Members of Public: Radiological Effects						
<p>During construction and development, the only measurable radiation doses predicted are to adjacent resident child and infant: 0.12 to 0.14 mSv/a for median dietary intakes and 0.12 to 0.15 mSv/a for upper bound dietary intakes. However, all predicted doses are within 15% of the CNSC public dose limit of 1 mSv/a, and would occur for only a relatively short duration for the infant and child.</p>	<p>Application of the ALARA principle.</p> <p>Radiation Protection Program.</p> <p>No additional proposed mitigation.</p>	No residual adverse effects.	<p>Excavation and transfer of waste commenced in 2016 November.</p> <p>The Radiation Protection Program was implemented effectively to ensure doses to the public are ALARA and are below the limited predicted effects.</p>	Monitor radiation doses to confirm accuracy of predictions.	<p>The radiation dose to public was estimated to be 0.4% of the annual dose limit of 1 mSv/a for exposures for members of the public.</p> <p>Total effective dose to the public was assessed with the inclusion of radon exposure at the fence line. A total effective dose was estimated to be around 2.8% for exposures for members of the public.</p>	<p>Upon comparison of the actual and predicted public doses, the doses exposed to the public are below the predicted levels. This has proven the mitigation measures were effectively executed.</p>
Cumulative Effects						
<p>Radiological:</p> <p>The combined predicted incremental annual average radon concentration associated with both the PHP and PGP would be indistinguishable from background at a distance of approximately 2 km.</p>	<ol style="list-style-type: none"> Working areas containing contaminated materials will be minimized. Application of dust suppressants including water and possibly chemical suppressants. Covering of stockpiles and exposed areas overnight and on weekends using foam agents, geotextiles, or other appropriate materials. Placing wind fencing around exposed stockpiles. Possible cessation of activities under high wind conditions. Mulching or re-vegetating 	No likely residual adverse effects.	Mitigation measures are implemented as outlined.	Verify radon concentrations and radiological constituents of resuspended dust at a distance of 2 km.	<p>Radon monitoring commenced at 3 locations around the PG LTWMF in 2017 December. These locations were less than 2 km distance from the LTWMF Controlled Area fenced boundary.</p> <p>The average radon concentration for 2024 at these locations reads 35.7 Bq/m³. The highest noted radon concentration level was 33 Bq/m³, which is below the environmental trigger level for radon 150 Bq/m³.</p>	<p>Assessment of average radon concentrations at 2 km will be performed quarterly.</p>

Predicted Effects [19]	Mitigation Measures	Residual Effects after Mitigation	Status of Mitigation Measures – 2024	EA Follow-Up Monitoring Requirements	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
	completed cells and excavation areas as soon as possible.					
<p>The radiological constituents of resuspended dust would not be measurable beyond approximately 2 km from the sites.</p>	<ol style="list-style-type: none"> 1. Working areas containing contaminated materials will be minimized. 2. Application of dust suppressants including water and possibly chemical suppressants. 3. Covering of stockpiles and exposed areas overnight and on weekends using foam agents, geotextiles, or other appropriate materials. 4. Placing wind fencing around exposed stockpiles. 5. Possible cessation of activities under high wind conditions. 6. Mulching or re-vegetating completed cells and excavation areas as soon as possible. 	<p>No likely residual adverse effects.</p>	<p>The PHAI Dust Management and Requirements Plan [9] was followed during Phase 2 activities. Phase 2 ended in 2022 December.</p>	<p>Verify radiological constituents of resuspended dust at a distance of 2 km.</p>	<p>No residual adverse effect.</p>	<p>The PG LTWMF transitioned to Phase 3 monitoring in 2023 January. Dust monitoring (TSP and PM_{2.5}) were not required as outlined in the PHAI Dust Management and Requirements Plan [9]. A yearly soil (dust deposition) monitoring program at a residential property located approximately 1 km east of the site commenced in 2016 June and concluded at the end of Phase 2 activities The soil results were compared yearly to verify radiological constituents in soil as a result of dust deposition.</p>

Table 18: Port Hope Project Environmental Assessment Follow-Up Monitoring Plan Summary, 2024

Predicted Environmental Effect [20]	Mitigation Measure	Residual Environmental Effect (remaining after mitigation)	Status of Mitigation Measures – 2024	EA Follow-up Monitoring Requirement	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
Atmospheric Environment						
<p>Air Quality: 24-hour average AAQC will be exceeded for arsenic and cobalt on occasions at offsite locations, including public receptor locations.</p> <p>Total suspended particulates of PM₁₀, PM_{2.5}, and nitrite will exceed the 24-hour AAQC at some offsite locations.</p>	<p>Reduce travel distances within LTWMF from 200 to 50 m for equipment distributing off-loaded contaminants.</p> <p>Install a fence-type barrier or other movable barrier at specific targeted locations.</p> <p>Construction equipment to meet Off-Road Compression-Ignition Engine Emission Regulations for use in areas of denser urbanization, where practicable.</p>	No residual adverse effects.	Construction equipment met Off-Road Compression-Ignition Engine Emission Regulations for PH LTWMF activities.	<p>Verify implementation of mitigation measures.</p> <p>Monitor arsenic and cobalt at offsite locations, including public receptor locations. Compare measured concentrations to predictions.</p> <p>Monitor levels of PM_{2.5} at off-site locations. Compare measured levels of PM_{2.5} to correlate the predicted air quality relationships between PM₁₀ and PM_{2.5}, and relationships between nitrite and PM_{2.5}.</p>	<p>There were no exceedances of the 24-hour AAQC [22] for arsenic or cobalt in 2024.</p> <p>CCME adopted the Air Quality Management System [22]. Canadian Ambient Air Quality Standards for Fine Particulate Matter (PM_{2.5}) are included, which replace the Canada-wide standards developed in 2000. A 2020 value of 27 µg/m³ is used for PM_{2.5} (98th percentile averaged over 3 years) was exceeded in 2024 due to poor air quality in Ontario from 2023 June to September.</p> <p>As described in the PHP Environmental and Biophysical Monitoring Plan [8], compliance with this criterion will also be protective of the potential effects from PM₁₀ and nitrite.</p>	<p>Air quality monitoring was conducted throughout 2024 at the PH LTWMF site. A holiday shutdown took place from 2024 December 24 to 2025 January 02.</p> <p>The Overriding Limit of 120 µg/m³ for TSP, as defined in the PHAI Dust Management Requirements and Plan [9] was not exceeded in 2024.</p> <p>The sample containing the highest net weight of TSP collected each week at each of the monitoring stations was sent for additional analysis to determine the concentration of metals and radionuclides in suspended dust.</p> <p>There were no exceedances of the AAQC [22] for metals in 2024. Radionuclide analysis results are discussed under <i>Radiological Effects, Particulate Radioactivity</i>.</p>
<p>Odour: MECP guideline for odour may be exceeded at properties near Highland Drive Landfill and the Port Hope Harbour.</p>	<p>Lime may be added to waste, for sulphur-related odours; foaming agents may be used to minimize surface odours; odour suppression sprays may be used.</p>	No residual adverse effects.	Contractors are required to submit Odour Control Plans prior to odour generating activities that are reviewed by CNL. Any odour suppressants are reviewed by CNL prior to use.	<p>During pre-construction and construction phases, conduct odour analysis at Highland Drive Landfill and Port Hope Harbour sites. Implement mitigation measures if odour analysis indicates they are necessary.</p>	<p>A third-party odour monitoring contractor monitoring to support the dredging activities at the Port Hope Harbour and remediation at the Highland Drive Landfill in 2024. Twice daily off-site upwind and downwind odour measurements were performed when dredging was taking place in 2024. There were 0 instances when the threshold level of 5 dilution-to-threshold was reached during dredging activities at Port Hope Harbour and Highland Drive Landfill off-site receptors.</p>	<p>A third-party odour monitoring contractor was procured in 2020 to support the monitoring during dredging in the Port Hope Harbour. Odour monitoring commenced in 2021 June.</p> <p>Mobilization at the Highland Drive Landfill took place in 2022 fall. The third-party odour monitoring contractor supported odour monitoring at the Highland Drive Landfill in 2024.</p>
<p>Noise:</p>	Hours of work will comply	Nuisance noise impacts on	Complied with Port Hope By-Law No	Verify implementation of mitigation	Noise monitoring was conducted	Implementation of mitigation

Predicted Environmental Effect [20]	Mitigation Measure	Residual Environmental Effect (remaining after mitigation)	Status of Mitigation Measures – 2024	EA Follow-up Monitoring Requirement	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
<p>Noise levels will increase by 12 dBA, to 63 dBA, for residents adjacent to the LTWMF during construction and development; by 13 dBA, to 67 dBA, for residents adjacent to the Alexander Ravine; and by 12 dBA, to 61 dBA, for residents along the Strachan Street transportation route.</p>	<p>with Port Hope By-Law No 30/2002, which prohibits construction between 11:00 pm and 7:00 am.</p> <p>At small- and medium-scale remediation sites in residential areas, activities would be limited to daylight hours and would conclude by 7:00 p.m.</p> <p>Construction equipment will comply with emission standards as outlined in Noise Pollution Control - 115 of the Ontario Model Municipal Noise Control By-Law.</p> <p>Trucks and other equipment will be equipped with mufflers. Tailgate banging will be avoided.</p> <p>Empty trucks will be required to reduce speed at construction sites and on local roads to avoid excessive cargo box and tray noise.</p> <p>Construction hoarding will be erected where practical.</p> <p>A noise mitigation plan will be developed and implemented for the intersection of the new access road and Toronto Road involving physical (e.g., berms) and operational (e.g., transportation protocols) elements.</p>	<p>local receptors.</p>	<p>30/2002 and WHO’s noise level limit of 70 dBA over a 24-hour period [27].</p> <p>Trucks and other equipment will be equipped with mufflers. Tailgate banging was avoided.</p> <p>Physical and operational elements were built into the design of the new access road: construction of a berm and installation of traffic lights.</p>	<p>measures.</p> <p>Measure noise levels at the LTWMF including the intersection of the proposed access road [now constructed] and Toronto Road during construction, at Alexander Ravine during remediation, and along the Strachan Street transportation route, to verify accuracy of predictions and effectiveness of mitigation measures.</p> <p>Monitor noise levels for compliance with appropriate by-laws and regulations governing hours of work and levels of noise.</p>	<p>around the LTWMF in 2024. The 2024 results are compared to 2015 baseline results prior to the start of the EW3a construction (when levels of activity around the site were comparatively low), it can be observed that the 2024 results are similar to 2023 with no notable increases of results.</p> <p>All values were below the predicted range of 12 dBA and the WHO’s <i>Guidelines for Community Noise</i> level of 70 dBA over a 24-hour period [27].</p> <p>The North, South, and Central Transportation Routes were also monitored in 2024. Monitoring along the Transportation Routes showed little to no increase from the baseline monitoring that took place prior to the remedial activities.</p>	<p>measures is verified during compliance inspections. Work was scheduled in compliance with local by-laws.</p> <p>Four main monitoring campaigns (January, April, July, and October) were completed for noise monitoring in 2024 at the PH LTWMF. The 2024 results are similar to 2023 with no notable increases.</p> <p>The North, South, and Central Transportation Routes were also monitored in 2024. Note that the Central Transportation Route monitoring incorporates Strachan Street Consolidation Site.</p>
<p>Radiological Effects,</p>	<p>Covering stockpiles and</p>	<p>No residual adverse</p>	<p>CNL-approved dust suppressants are</p>	<p>Verify implementation of</p>	<p>Radon measurements are taken</p>	<p>Radon gas and radon progeny was</p>

Predicted Environmental Effect [20]	Mitigation Measure	Residual Environmental Effect (remaining after mitigation)	Status of Mitigation Measures – 2024	EA Follow-up Monitoring Requirement	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
<p>Radon: Annual average radon concentrations, downwind from the LTWMF during construction and development, are expected to be 25.3 Bq/m³.</p> <p>The radon pathway will be eliminated.</p>	<p>exposed areas overnight and on weekends.</p> <p>Applying dust suppressants.</p> <p>Restricting or ceasing work under high wind conditions.</p> <p>Minimizing the exposed working face.</p> <p>Re-vegetation of completed cells and excavation areas as soon as possible.</p> <p>Modifying methane gas piping exit vents to mitigate radon gas emanating from Cell 3 of the LTWMF.</p>	<p>effects.</p>	<p>used.</p> <p>Work was restricted or ceased under high wind conditions.</p> <p>Re-vegetation of the work areas is to be completed at the end of the PH LTWMF project.</p> <p>On-site remediation continued in 2024. Activities were performed by the contractor in accordance with a radiation protection plan, approved by CNL. Requirements of the plan include ALARA principles, completion of a radiological safety assessment, and use of radiological work permits/assessments. Dose tracking and work planning measures are in place to ensure worker dose is ALARA.</p>	<p>mitigation measures at times appropriate to the measure.</p> <p>During construction and during development, measure concentrations of radon and long-lived alpha emitters downwind from the LTWMF to verify modelling predictions.</p> <p>During construction and operations, measure radon gas concentrations in the area immediately surrounding the methane gas piping exit vents at Cell 3 of the LTWMF. Length of monitoring would be limited to several years if no impact is demonstrated.</p>	<p>monthly at the fence line as a representative reading to the public and around the existing engineered containment system. Measurements taken are located at the fence line around the boundary. At the fence line, the average radon measurements ranged from 37 to 525 Bq/m³.</p> <p>The trigger level for radon monitoring is 150 Bq/m³. Results from the 2024 radon monitoring program confirm a public dose estimate to be 29.5 Bq/m³ (or 3% of the annual limit for the public) based on the maximum readings from Radon is measured along the fence line, with a conservative occupancy period of 60 hours per year. The integrity of the ALARA Program is managed through routine monitoring and reviews of dose records to confirm that no adverse trends or exceedances have occurred.</p>	<p>monitored on a routine monthly basis at the Port Hope LTWMF during the 2024 calendar year.</p>
<p>Radiological Effects, Particulate Radioactivity: The predicted levels for the following radionuclides are below Health Canada reference levels: radium-226 (0.00049 Bq/m³, compared with 0.05 Bq/m³); thorium-230 (0.00042 Bq/m³, compared with 0.01 Bq/m³), thorium-232 (0.00057 µg/m³ compared with 0.006 Bq/m³), and uranium (0.0018 µg/m³ compared with 4.07 µg/m³).</p>	<p>Implement watering to control dust on unpaved roads and excavation areas.</p> <p>Implement vacuum sweeping and water flushing on paved roads.</p>	<p>No residual adverse effects.</p>	<p>Watering trucks and spray-on technology used in areas of excavation.</p>	<p>Verify implementation of mitigation measures.</p> <p>Measure levels of radium-226, thorium-230, thorium-232, and uranium at work sites and along haul roads to verify modelling predictions.</p>	<p>TSP high volume air sampler filters were sent for additional laboratory analysis in 2024. Radium-226, thorium-232, and uranium exceeded the predicted values for some of the filters in 2024; however, they remained well below the Health Canada reference values. It should be noted that the exceedances of the predicted values are related to laboratory detection limits (uncalculated laboratory results were less than the limit of detection for radium-226, thorium-232, and uranium). The predicted values were based on modelling PM₁₀ concentrations. Comparing particulate radioactivity on TSP filters to the modelled</p>	<p>The sample containing the highest net weight of TSP collected each week at each of the monitoring stations was sent for additional analysis to determine the concentration of COPCs in suspended dust.</p>

Predicted Environmental Effect [20]	Mitigation Measure	Residual Environmental Effect (remaining after mitigation)	Status of Mitigation Measures – 2024	EA Follow-up Monitoring Requirement	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
					predictions is taking a conservative approach.	
Aquatic Environment						
<p><i>Sediment Quality (Sculthorpe Marsh):</i> If remediation work is carried out in the Sculthorpe Marsh, the effect resulting from the sediment removal is expected to reduce invertebrate productivity temporarily.</p> <p><i>(See also, Terrestrial Environment Component.)</i></p>	<p>Conduct sediment toxicity testing to confirm the need for remediation and/or refine area/extent/scope of any required sediment removal.</p> <p>Develop a Marsh Protection and Restoration Plan, which could include replacement of coarse organic matter and re-planting of shoreline vegetation.</p>	<p>No residual adverse effects.</p>	<p>The remediation of the Sculthorpe Marsh will not occur as it is a provincially significant wetland. Ongoing discussions continue with the Municipality of Port Hope.</p>	<p>Monitor recovery of benthic invertebrates and aquatic communities against predicted timelines.</p>	<p>Monitoring of the recovery of benthic invertebrates has not been conducted as remediation has not occurred.</p>	<p>The remediation of the Sculthorpe Marsh will not occur as it is a provincially significant wetland. Ongoing discussions continue with the Municipality of Port Hope.</p>
<p><i>Surface Water Quality, Radiological Effects:</i> Concentrations of arsenic and uranium will decrease by 78% to 88% in the Highland Drive, South Creek, and Brewery Creek.</p> <p>Concentrations of uranium and radium-226 would decrease similarly in Alexander Creek.</p> <p>Concentrations of radium-226 and uranium are expected to increase in the area between the harbour and the Ganaraska River, during dredging of the harbour, but to remain below PWQO.</p> <p>Uranium concentrations in the groundwater and down-gradient surface water in the area of the LTWMF are expected to decrease by 63%.</p>	<p>The mitigation measures include the design (e.g., the low-permeability cover on the LTWMF and permeable reactive barriers installed in Highland Drive South Ravine), operation and management (e.g., storm water management) features of the project proposal.</p> <p>An Emergency Response Plan will be developed to address unexpected events. A Spill Contingency Plan will be developed to deal with unexpected spills of fuels and lubricants. Spill control and clean-up equipment will be provided in all work locations.</p> <p>Erosion and sediment control structures will be in place and will be inspected and maintained regularly.</p>	<p>No residual adverse effects.</p>	<p>A temporary wave attenuator and turbidity curtain(s) are present at the Harbour.</p> <p>Emergency Response Plans are developed for project sites and reviewed by CNL.</p> <p>A Spill Contingency Plan has been developed to deal with unexpected spills of fuels and lubricants. Spill control and clean-up equipment is provided at all work locations.</p> <p>Erosion and sediment control structures are in place and are inspected and maintained regularly.</p>	<p>Measure concentrations of arsenic and uranium at the Highland Drive South Creek and Brewery Creek; concentrations of uranium and radium-226 in Alexander Creek; concentrations of radium-226 and uranium in the area between the harbour and the Ganaraska River during dredging of the harbour; and uranium concentrations in the groundwater and down-gradient surface water in the area of the LTWMF, to verify accuracy of predictions.</p> <p>Review Emergency Response Plan, Spill Contingency Plan and require revisions if necessary, until plans are deemed acceptable.</p> <p>Verify presence of spill control and clean-up equipment at all work locations.</p> <p>Verify presence of erosion and sediment control structures, and review inspection and maintenance protocol.</p>	<p>No residual adverse effects on surface water. There was no observable decrease in uranium concentrations in Brand Creek (downgradient of the LTWMF). This is not expected until the project evolves and the waste is remediated.</p> <p>In the Port Hope Harbour, uranium concentrations were observed to exceed the PWQO [13] during dredging. The original EA prediction used theoretical or predicted data inputs to the model. Actual conditions related to daily inputs of water to the inner harbour during dredging have resulted in a different set of conditions, requiring that the proposed EA mitigation measures be modified. CNL engaged Responsible Authorities to ensure a path forward for the protection of Lake Ontario and the Ganaraska River. This has resulted in the creation of a robust monitoring program to ensure the protection of the</p>	<p>Monitoring of surface water at the Highland Drive South Ravine Creek, Brewery Creek, Brand Creek, and Alexander Creek was completed in 2024.</p> <p>Surface water sampling was completed during the Port Hope Harbour dredging activities. Uranium exceeded the PWQO [13] and CWQG [15] at PHH-2a in 2024.</p> <p>Monitoring of the surface water downgradient of the LTWMF (including Lake Ontario) is performed on a continuous, quarterly basis. (Section 1.4.2).</p> <p>Oversight is used by CNL personnel to confirm the suitability, implementation, and effectiveness of processes applied to PHAI project activities in order to comply with contractual obligations, licensing requirements, federal/provincial acts and regulations, environmental management and protection plans, compliance plans, and technical specifications. Oversight (refer to the</p>

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					<p>aquatic environment while dredging activities continue at the Port Hope Harbour.</p>	<p>PHAI Waste Management Project Annual Compliance Report for 2024 [2]) is applied by CNL taking into consideration the importance and complexity of activities and the organization(s) involved in the management of these activities. Activities performed by PHAI consultants, contractors, and service providers are subject to oversight.</p>
<p>Surface Water Quality, Non-Radiological Effects: Long-term improvement to down-gradient surface water quality, reduced contaminant loadings to down-gradient streams, and no measurable change to Ganaraska River are the effects predicted.</p> <p>Any storm water flow which permeates the dike during harbour cleanup is not expected to raise contaminant concentrations above PWQO in the harbour or Ganaraska River.</p> <p>Surface water infiltration into and through contaminated materials, to groundwater and down-gradient surface water, is expected to decrease.</p> <p>Contaminant loadings from LTWMF leachate, discharging to the lake, would be reduced by 44%.</p>	<p>Groundwater, storm water, and drainage water collection and treatment systems, including flow control and quality control, will be in place.</p> <p>Dike and silt screen will isolate harbour work from Lake Ontario.</p>	<p>No residual adverse effects.</p>	<p>Required sampling of groundwater, storm water, and drainage water took place during the PH LTWMF construction activities.</p> <p>No residual adverse effects for the PH LTWMF construction work.</p> <p>Sampling took place at Highland Drive South Ravine Creek, Brewery Creek, Brand Creek, and Alexander Creek in 2024 and will continue to take place in 2025.</p> <p>It is to be noted that subsequent to the acceptance of the EA by the Responsible Authorities, the preliminary design for the PHP continued to be refined in support of the licence application, and some changes to preliminary design concepts were made.</p> <p>Among the design changes was the substitution of the proposed dike for purposes of separating the Approach Channel and Turning Basin from the Outer Harbour during dredging operations with a series of silt curtains to prevent transmission of suspended solids out of the harbour during dredging; with the curtains being protected from wave damage by a floating wave attenuator designed for the dissipation of wave energy in harbours.</p> <p>This (and all other design</p>	<p>Verify predicted improvements in surface water.</p> <p>Proponent must ensure that discharge is not deleterious to aquatic environment (fish) at point of discharge and appropriate monitoring must be employed to confirm this.</p> <p>Monitor contaminant concentrations in the harbour and Ganaraska River during the harbour cleanup following any storms.</p> <p>Monitor mercury and levels of other COPCs in fish tissue to verify predictions.</p> <p>Verify reduction of contaminant loadings due to leachate discharging to Lake Ontario.</p> <p>Monitor the maintenance of silt curtains.</p>	<p>There was no observable decrease in contaminant concentrations to downgradient Brand Creek; however, this is not expected until the project evolves and the waste is remediated.</p> <p>Sampling took place at Highland Drive South Ravine Creek, Brewery Creek, Port Hope Harbour, and Alexander Creek in 2024.</p>	<p>Monitoring of surface water at the Highland Drive South Ravine Creek, Brewery Creek, Brand Creek, and Alexander Creek was completed in 2024.</p> <p>Monitoring of surface water at the Port Hope Harbour and Ganaraska River Confluence was conducted in 2024 and will continue in 2025.</p> <p>Monitoring of the surface water downgradient of the LTWMF (including Lake Ontario) is performed on a continuous, quarterly basis. The PH LTWMF construction activities did not appear to be affecting surface water quality (Section 1.4.2).</p> <p>Monitoring of COPCs in fish tissue is to occur during the Maintenance and Monitoring Phase.</p> <p>Monitoring of the maintenance of the silt curtains will occur during the construction period around water features at Alexander Creek, Highland Drive South Creek, Brand Creek, if necessary, and near Lake Ontario.</p>

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			refinements), and the potential environmental effects associated with the change, were described in the Engineering Change Summary Report, which was submitted to, and approved by, the Responsible Authorities. Therefore, the silt barrier and wave attenuator are incorporated into the detailed design description report.			
<p><i>Sediment Quality (Harbour):</i> A long-term improvement to harbour sediment quality and habitat conditions is predicted.</p>	<p>Beneficial effects will be enhanced by the development of fish habitat enhancement incorporated into the harbour detailed design.</p>	<p>Beneficial effect.</p>	<p>Design of harbour incorporates enhancement to fish habitat. Monitoring is to take place in the maintenance and monitoring phase.</p>	<p>Verify design enhancements have improved the fish habitat in the harbour. Monitor sediment quality and habitat conditions.</p>	<p>Not applicable. Expected to be a beneficial effect. Monitoring is to take place in the maintenance and monitoring phase.</p>	<p>Monitoring is to occur during Maintenance and Monitoring Phase.</p>
<p>Geology and Groundwater Environment</p>						
<p><i>Soil Quality, Radiological Effects:</i> The mean incremental concentrations of radiological contaminants are expected to be less than 10% of background at remediation sites. The incremental concentrations at the LTWMF would be less than 20% of background.</p> <p>The exception is thorium-230, with an expected 63% increase in concentration over baseline during construction and development of the LTWMF, to a predicted mean concentration of 97.7 Bq/kg, with a maximum predicted concentration of 141.9 Bq/kg.</p>	<p>Reduce travel distances within LTWMF from 200 to 50 m for equipment distributing off-loaded contaminants.</p>	<p>No residual adverse effects.</p>	<p>The PHAI Dust Management and Requirements Plan [9] was implemented during the PH LTWMF construction activities and remediation at major sites.</p> <p>The Dust Management and Requirements Plan – Small-Scale Sites Remediation was merged with the PHAI Dust Management and Requirements Plan [9] and implemented and used for the Small-Scale Sites remediation in 2024.</p>	<p>Measure concentrations of all radiological contaminants at all remediation sites and at the LTWMF to verify modelling predictions.</p> <p>Monitor concentrations of thorium-230 at the LTWMF perimeter fence and in the surface soils adjacent to it.</p>	<p>No residual adverse effects.</p> <p>In 2024, thorium-230 soil concentrations at the LTWMF have not increased from baseline (Section 0).</p>	<p>Surface soil monitoring for radiological contaminants of interest around the PH LTWMF and the Highland Drive Landfill Site were monitored in 2024.</p> <p>Monitoring is planned annually during construction activities at both sites.</p>
<p><i>Soil Quality, Non-Radiological Effects:</i> Relates to potential disposition of contaminants on surface at perimeter of LTWMF (see <i>Atmospheric Environmental Component</i>). Predicted maximum concentrations: arsenic 4.7 mg/kg, cobalt 6.67 mg/kg.</p>	<p>(See <i>Atmospheric Environmental Component</i>.)</p>	<p>No residual adverse effects.</p>	<p>No residual adverse effects for PH LTWMF construction work.</p> <p>Watering trucks and spray-on technology used in areas of excavation.</p>	<p>Verify predicted soil concentrations of arsenic and cobalt at perimeter of LTWMF.</p>	<p>In 2024, concentration of arsenic (7.40 µg/g) at the LTWMF was greater than the predicted concentration at PH-WWMF-SS-01. All other sampling locations were below predicted concentrations (Section 0).</p> <p>There are no immediate environmental concerns.</p>	<p>Surface soil monitoring for non-radiological contaminants of interest around the perimeter of the PH LTWMF and the Highland Drive Landfill Site occurred in the 2024.</p> <p>Monitoring is planned annually for the remainder of the project for both sites.</p>

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<p>Groundwater Quality, Radiological Effects: With removal of source contamination, uranium concentrations at Mill Street and Alexander Street sites are predicted to decline below applicable criterion value within approximately 25 years.</p>	No mitigation required.	No residual effects.	<p>Pre-construction groundwater monitoring at the Mill Street South site occurred in 2012-2013.</p> <p>Monitoring of selected remediated sites will occur following remediation to verify EA predictions.</p>	Measure uranium concentrations at remediated Mill Street and Alexander Street sites. Report measurements annually to verify modelling predictions.	No residual adverse effects.	<p>Pre-construction groundwater monitoring at the Mill Street South site occurred in 2012-2013.</p> <p>Monitoring of selected remediated sites will occur following remediation to verify EA predictions.</p>
<p>Groundwater Quality: Volume of groundwater collected for treatment in the LTWMF groundwater drainage water collection system would decrease by approximately 30%; contaminant concentrations are expected to decline over time.</p>	Collected groundwater water will be treated to requirements set by the CNSC during licensing of the LTWMF.	No residual adverse effects.	WWTP construction was completed in 2016 – active commissioning commenced in the fall of 2016.	Measure volume and concentrations of contaminants in LTWMF groundwater collection system annually to verify predictions.	Elevated concentrations of some COPCs are identified in samples of drainage water and groundwater collected in 2024. Changes in drainage water quality and volume were expected to occur after remediation work commenced. Drainage water on site is treated prior to release to the environment.	<p>Monitoring of LTWMF groundwater-drainage water collection system occurred in 2024.</p> <p>Monitoring of groundwater and drainage water will continue throughout the Construction and Development Phase.</p>
<p>Drainage Water Volume: A 66% reduction is predicted for the volume of drainage water to be collected in the groundwater/drainage water collection and treatment system, to 27,380 m³/yr after the cover is placed on the LTWMF.</p> <p>A reduction of 92,110 m³/yr to 116,280 m³/yr is predicted for the sum of groundwater and drainage water discharge, an overall volume reduction of 44%.</p>	Not applicable.	No applicable.	Not applicable.	Measure volume of drainage water at the LTWMF annually to verify predictions.	Not applicable. Predictions are to be verified in the Maintenance and Monitoring Phase when the cover is placed on the LTWMF.	Monitoring of groundwater and drainage water will continue throughout the Construction and Development Phase.
<p>Groundwater Flow: It is predicted that the water table will be lower by 10 m, and that the groundwater mounding under the existing facility will dissipate.</p> <p>Groundwater discharge to Brand Creek is predicted to decrease by 2%.</p> <p>Groundwater discharge to the onsite drainage system is predicted to decrease by 30%.</p>	Not applicable.	Not applicable.	Not applicable.	<p>Confirm lowering of water table.</p> <p>Confirm dissipation of mounding by monitoring water table beneath and adjacent to the LTWMF.</p> <p>Monitor stream flow and perform base flow separation to get groundwater discharge, to confirm 2% decrease is not exceeded, and that there is a 30% decrease in groundwater discharge to the on-site drainage system, and a 42% decrease in the volume of treated</p>	No residual adverse effects.	<p>The average water levels in groundwater monitoring wells in 2024 are generally comparable to previous years. Monitoring will continue throughout the Construction and Development Phase.</p> <p>The volume of treated effluent discharged to Lake Ontario is monitored on a continuous basis. Monthly Effluent volumes discharged to Lake Ontario are provided.</p>

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The treated effluent volume to be discharged to Lake Ontario is predicted to decrease by 42%.				effluent discharged to Lake Ontario. Monitor groundwater flow and direction to verify assessment assumption. Continue monitoring to increase understanding.		
Groundwater Quality and Quantity: No measurable changes of quality or quantity of groundwater and drainage water during LTWMF construction. Maximum breakthrough of COPCs through the LTWMF would be 1% of PWQO [13] and Ontario Drinking Water Standards [21] criteria.	Not applicable.	Not applicable.	Not applicable.	Monitor quantity and quality of groundwater and drainage water intercepted during construction to confirm prediction of no measurable change.	No measurable change to groundwater and drainage water quality was observed in 2024 sampling results (Section 1.4.2).	Drainage water and groundwater were monitored in 2024 and will continue to be monitored throughout the Construction and Development Phase.
Design of LTWMF, including liners and covers Primary and secondary liner units would have maximum hydraulic conductivity of 1×10^{-7} cm/s. Cover would have a maximum hydraulic conductivity of 1×10^{-8} cm/s. Volume (annual) of leachate generated within the LTWMF is predicted to be 150 m ³ based on the assumption of 1 mm/yr leakage through the cover.	Not applicable.	Not applicable.	Not applicable.	Monitor leakage through the primary liner using the collection system installed between the primary and secondary liners to verify hydraulic conductivity of the liner units. Monitor settlement of the LTWMF cover to confirm the assumption that there will not be excessive settlements of the waste under the cover that would compromise the cover performance. Monitor rate of infiltration through the LTWMF cover to verify the hydraulic conductivity of the cover and confirm the assumed leakage rate through the cover system.	Not applicable until Maintenance and Monitoring Phase.	Monitoring to occur in the Maintenance and Monitoring Phase.
Volumes of Excavated Wastes Volumes of excavated wastes to be stored in the LTWMF are predicted to be as follows: 620,000 m ³ of LLRW, 572,000 m ³ of material mixed with LLRW, 51,250 m ³ of industrial waste, and 150,000 m ³ of Cameco decommissioning and stored waste. Predictions of contaminant concentrations are found in Tables 9.2.2-1 and 9.2.1-2 of the PHP EA Study Report [28].	Not applicable.	Not applicable.	Not applicable.	Verify the volume and concentrations of excavated waste prior to emplacement in the LTWMF to confirm the source term volumes and contaminant concentrations used to predict long-term environmental effects.	On-site waste movement occurred from 2024 January 02 to 2024 December 23 [2].	Volume of waste will be monitored as waste is placed in the cells of the PH LTWMF.

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Terrestrial Environment						
<p>Preparation of the LTWMF site will result in temporary loss of vegetation of 3% in Local Study Area and 11% in Site Study Area, with permanent conversion of vegetation communities in 11% of Local Study Area and 47% of Site Study Area.</p> <p>Remediation of sites within Ward 1 will result in temporary loss of 7.6% of vegetation within Local Study Area and 53% in Site Study Area.</p> <p>Remediation of sites outside the Highland Drive Site Local Study Area will result in temporary loss of 34% (18.3 ha) of vegetation.</p>	<p>Relocation of the LTWMF storm water management pond out of the wooded area into an area of cultural meadow vegetation.</p> <p>Development of new vegetation communities at the LTWMF site, rather than re-establishing pre-construction conditions.</p> <p>Development of a protection and rehabilitation plan for the fen and beach vegetation at the Waterworks West site.</p> <p>Implementation of erosion and sediment control structures around cleared sites.</p> <p>Application of dust suppression techniques.</p> <p>Rehabilitation of sites after completion of waste removal.</p> <p>Development of a site-specific landscape plan of each work site.</p> <p>Vegetation clearing should not take place in migratory bird habitat during the breeding season. In exceptions, when the breeding season cannot be avoided, an avian biologist will conduct a nest survey immediately prior (e.g.,</p>	<p>No residual adverse effects.</p>	<p>CNL performed oversight regularly to ensure compliance with the approved Environmental Protection and Management Plans.</p> <p>CNL-approved dust suppressant was used when needed to aid in the dust management for the construction activities.</p> <p>Site-specific rehabilitation and landscape plans will be created at the end of the construction and remediation activities.</p>	<p>Verify relocation of storm water management pond.</p> <p>Verify development of protection and rehabilitation plans for the fen and beach vegetation at the Waterworks West site.</p> <p>Verify implementation of erosion and sediment control structures, application of dust suppression techniques, and rehabilitation of sites.</p> <p>Verify extent and duration of temporary and permanent loss/change.</p> <p>Confirm that no vegetation clearing is occurring during breeding season. In exceptions, confirm that nest survey was conducted and reviewed.</p> <p>Review site-specific remediation plans to confirm incorporation of structural habitat qualities and variability.</p>	<p>No residual adverse effects.</p>	<p>CNL performed oversight on a regular basis to ensure compliance with the approved Environmental Protection and Management plans.</p> <p>A Dust Monitoring Program was carried out by an independent contractor (not the prime contractor or CNL) for the PH LTWMF activities to ensure that perceived organizational conflicts regarding dust monitoring results and work activities had been avoided.</p> <p>Continuous monitoring occurs during the work hours, and results are reported at 15-minute intervals. Any exceedances as identified in PHAI Dust Management and Requirements Plan [9] are immediately reported to CNL and the prime contractor to initiate corrective action.</p> <p>CNL-approved dust suppressant was used when needed to aid in the dust management for the PH LTWMF construction activities.</p> <p>The PH LTWMF site clearing activities were completed from November to March, which is outside the migratory bird breeding season for this area.</p>

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	<p>within 2 days) to starting any work potentially impacting migratory bird habitat, to identify and locate active nests of species covered by the <i>Migratory Birds Convention Act</i>. A mitigation plan would be developed to address any potential impacts on migratory birds or their active nests and forwarded for review to Environment Canada prior to implementation.</p> <p>Site-specific rehabilitation plans will incorporate features to re-establish structural habitat qualities and variability for sites (including at Sculthorpe Marsh if its remediation is warranted).</p>					
Terrestrial (Sculthorpe Marsh)	<p>If remediation occurs (in the Sculthorpe Marsh), a Protection and Restoration Plan would be developed to ensure no net loss of wetland function, and should include:</p> <p>No excavation into beach bar; Protection of willow trees along public trails, from excavation or on-site movement of machinery; Erosion prevention, and; Accelerated soil stabilization and plant growth.</p>		<p>The remediation of Sculthorpe Marsh will not occur as it is a provincially significant wetland. Ongoing discussions continue with the Municipality of Port Hope.</p>	<p>Verify development of Protection and Restoration Plan that is acceptable to provincial and federal regulatory agencies; and Verify no net loss of wetland functions.</p>	<p>The remediation of Sculthorpe Marsh will not occur as it is a provincially significant wetland. Ongoing discussions continue with the Municipality of Port Hope..</p>	<p>The remediation of Sculthorpe Marsh will not occur as it is a provincially significant wetland. Ongoing discussions continue with the Municipality of Port Hope.</p>
Human Health and Safety						
<p>Workers: Non-Radiological Effects: Maximum dust exposures to non-radiological conventional contaminants</p>	<p>(See <i>Atmospheric Environmental Component</i>.) Personal protection equipment would be</p>	<p>No residual adverse effects.</p>	<p>CNL reviewed and approved contractor Health and Safety Plan for the PH LTWMF projects.</p>	<p>Monitor compliance with relevant federal legislation related to protection of health and safety.</p>	<p>No residual adverse effects.</p>	<p>Contractors are required to adhere to federal or provincial legislation related to the protection of health and safety depending on the site and</p>

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<p>within established weighted average criteria (AAQC) for acute 8-hour exposures.</p> <p>For construction activities: annual accident rate of 2.0 to 3.0 lost time accidents, and 8.0 to 10.0 total recordable accidents per 100 workers. This equates to 24.4 recordable accidents during construction and development, with 7.3 of the accidents resulting in lost time; 7.8 recordable accidents during site remediation work, with 2.3 of the accidents resulting in lost time.</p> <p>Noise levels would reach 88 to 96 dBA in construction areas.</p>	<p>supplied to mitigate noise effects.</p> <p>All workers would be provided with and required to implement worker protection measures as set out by the Port Hope Site Health and Safety Plan.</p> <p>Implement a policy that all occupational illnesses and injuries are preventable and adopt an operational objective of zero occupational illnesses and injuries (for details, see the specific elements of this policy as listed under Mitigation Measures in Table 11.9.1 of the PHP Screening Report [20]).</p> <p>Implement a Health and Safety Plan procedure and an Environmental Protection Plan protocol to address the demolition of buildings and the appropriate management of debris materials generated from these activities.</p> <p>Notify residents when activities are expected to result in a 6 dBA increase in noise.</p> <p>Establish an operational protocol that will maintain noise levels at the fence line below 70 dBA.</p> <p>Prevent public access to areas where noise levels may exceed 70 dBA.</p>		<p>Construction contractors are required to adhere to federal or provincial legislation related to the protection of health and safety where applicable. Compliance oversight occurred during the PH LTWMF activities.</p> <p>Implemented a Health and Safety Plan procedure and an Environmental Protection Plan protocol to address the demolition of buildings and the appropriate management of debris materials generated from these activities.</p> <p>Residents were notified when activities were expected to result in a 6 dBA increase in noise.</p> <p>Noise levels at the fence line of the PH LTWMF did not exceed 70 dBA.</p> <p>Public access was restricted to the PH LTWMF site.</p>	<p>Monitor accident rate.</p> <p>Verify the development of an operational policy, and confirm the details conform to the elements proposed as mitigation measures.</p> <p>(Note that some follow-up elements in the Atmospheric Environment are also relevant in that they are fundamentally intended for the protection of worker health and safety).</p>	<p>For construction activities at the PH LTWMF there were no recordable events in 2024.</p>	<p>project activity where applicable. Compliance oversight occurred during the PH LTWMF activities. Refer to the PHAI Waste Management Project Annual Compliance Report for 2024 [2] for an overview of the compliance oversight program.</p> <p>Incident rates are being monitored [2].</p> <p>Contractors conducting work on behalf of the PHAI submit health and safety plans, for CNL’s review and acceptance, which are consistent with the requirements of the PHAI Occupational Safety and Health Plan [30].</p> <p>Noise monitoring was completed by CNL over four campaigns in 2024 around the PH LTWMF. It can be observed that there are some increases in 2024 but below the predicted range of 12 dBA and the WHO’s <i>Guidelines for Community Noise</i> level of 70 dBA over a 24-hour period [27].</p>
<p>Members of the Public, Non-Radiological Effects: Air Quality; Noise and Non-Radiological Contaminants: See Atmospheric Environment Component for predicted effects, mitigation measures, residual</p>	<p><i>(See Atmospheric Environment Component.)</i></p> <p>Implement protocols for delivering information to and receiving concerns from</p>	<p>Increased stress and adverse effects to health and general well-being resulting from negative changes to people’s feelings of health and</p>	<p>In 2024, CNL received 22 Tier 1 complaints related to the PHP, 18 of which were resolved at the CNL level. The remaining four Tier 2 complaints continue into 2025 for further investigation.</p>	<p>Monitor communications protocol.</p> <p>Survey members of the public to confirm level of satisfaction with the community.</p>	<p>A public attitude survey was completed in 2024.</p>	<p>Since 2002, the CNL has commissioned regular public attitude surveys to monitor public awareness of the PHAI, identify issues and concerns, determine communication needs of the public, and provide data</p>

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<p>effects after mitigation, and follow-up program features. General Health and Well-Being. 22% of people surveyed expect their level of satisfaction with the community to increase with completion of the project, 14%, to decrease.</p>	<p>residents to address their concerns for health, sense of well-being, feelings of safety and security, and of satisfaction with their community.</p>	<p>sense of well-being, feelings of personal security, and feelings of satisfaction with their community.</p>	<p>A public attitude survey was completed in 2024.</p>			<p>regarding public attitudes. The PHAI Waste Management Project Annual Compliance Report for 2024 [2] discusses PHAI interactions within the community of Port Hope. A public attitude survey was completed in 2024.</p>
<p>Workers, Radiological Effects: Workers excavating on-site wastes and placing on- and off-site wastes are expected to receive annual radiation doses between 1.6 and 2.7 mSv/a. Workers dewatering sediment during harbour cleanup are expected to receive doses up to 7.6 mSv/a.</p>	<p><i>(See Atmospheric Environment Component.)</i> If necessary, workers would be rotated in and out of positions where there is a risk of receiving a higher dose.</p>	<p>No residual adverse effects.</p>		<p>Monitor radiation doses to confirm accuracy of predictions. (Note that some follow-up elements in the Atmospheric Environment are also relevant in that they are fundamentally intended for the protection of worker health and safety).</p>	<p>For PHAI, individual annual doses ranged from 0.00 to 0.4 mSv/a. The collective radiation dose was 18.57 person-mSv. The average annual dose was 0.01 mSv/a.</p>	<p>Upon comparison between the actual and predicted doses, the doses exposed to the workers were below the predicted levels. This has proven the mitigation measures were effectively executed.</p>
<p>Members of the Public, Radiological Effects: During remediation, Ward 1 adjacent residents: radiation dose of 0.074 mSv/a for adult on median diet, 0.16 mSv/a for infant on upper bound diet. During construction and development, Ward 1 residents: 0.06 mSv/a for an adult, to 0.25 mSv/a for an infant. Ward 2 residents: 0.12 mSv/a for an adult on a median diet, to 0.25 mSv/a for an infant on an upper bound diet.</p>	<p><i>(See Atmospheric Environment Component.)</i> No additional proposed mitigation.</p>	<p>No residual adverse effects.</p>	<p>Remediation activities continued in 2024.</p>	<p>Monitor radiation doses to confirm accuracy of predictions. (Note that some follow-up elements in the Atmospheric Environment are also relevant in that they are fundamentally intended for the protection of the health and safety of members of the public).</p>	<p>Fence line gamma dose in 2024 contributed to 0.4% of the annual dose limited for occupational exposures for members of the public of 1 mSv/a. Total dose to the public was assessed with the inclusion of radon exposure at the fence line. A total effective dose was estimated to be 3.0% for exposures for members of the public.</p>	<p>The radiation dose to public was measured to be 0.03 mSv/a, which is 3% of the annual dose limit for occupational exposures for members of the public of 1 mSv/a (1,000 µSv/a).</p>
<p>Cumulative Effect (in the Biophysical Environment)</p>						
<p>Radiological Effects: Incremental annual average radon concentrations would be indistinguishable from background at a distance of 2 km; radiological constituents of re-suspended dust would not be measurable beyond approximately 1 km.</p>	<p><i>(See Atmospheric Environment Component.)</i></p>	<p>No residual adverse effects.</p>	<p>Remediation activities continued in 2024.</p>	<p>Verify radon concentrations and radiological constituents of re-suspended dust, at distance of 2 km and 1 km, respectively. (Note that this follow-up monitoring requirement is incorporated into the <i>Atmospheric Environment</i> follow-up program.)</p>	<p>Radon monitoring commenced at four locations around the PH LTWMF in 2018. These locations were positioned at a distance of approximately 2 km from the LTWMF Controlled Area fenced boundary. The average radon concentration for 2024 across all locations was calculated to be 51.8 Bq/m³. The highest noted radon concentration level was 78 Bq/m³, which is below the environmental trigger level for radon 150 Bq/m³.</p>	<p>Assessment of average radon concentrations at 2 km will be performed quarterly to receive better statistics. In 2018 July, CNL deployed a dust fall jar monthly, following the MECP siting requirements, to measure the potential dust deposition at 1 km from the site. The location was approximately 1 km north of the PH LTWMF site. The dustfall jar was deployed until one year of data was collected, in which the EA prediction</p>

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Predicted Environmental Effect [20]	Mitigation Measure	Residual Environmental Effect (remaining after mitigation)	Status of Mitigation Measures – 2024	EA Follow-up Monitoring Requirement	Predicted Environmental Effect – 2024	Status of EA Commitments – 2024
						that radiological constituents of re-suspended dust will not be measurable beyond approximately 1 km from the site was verified.

C.1 Atmospheric Monitoring

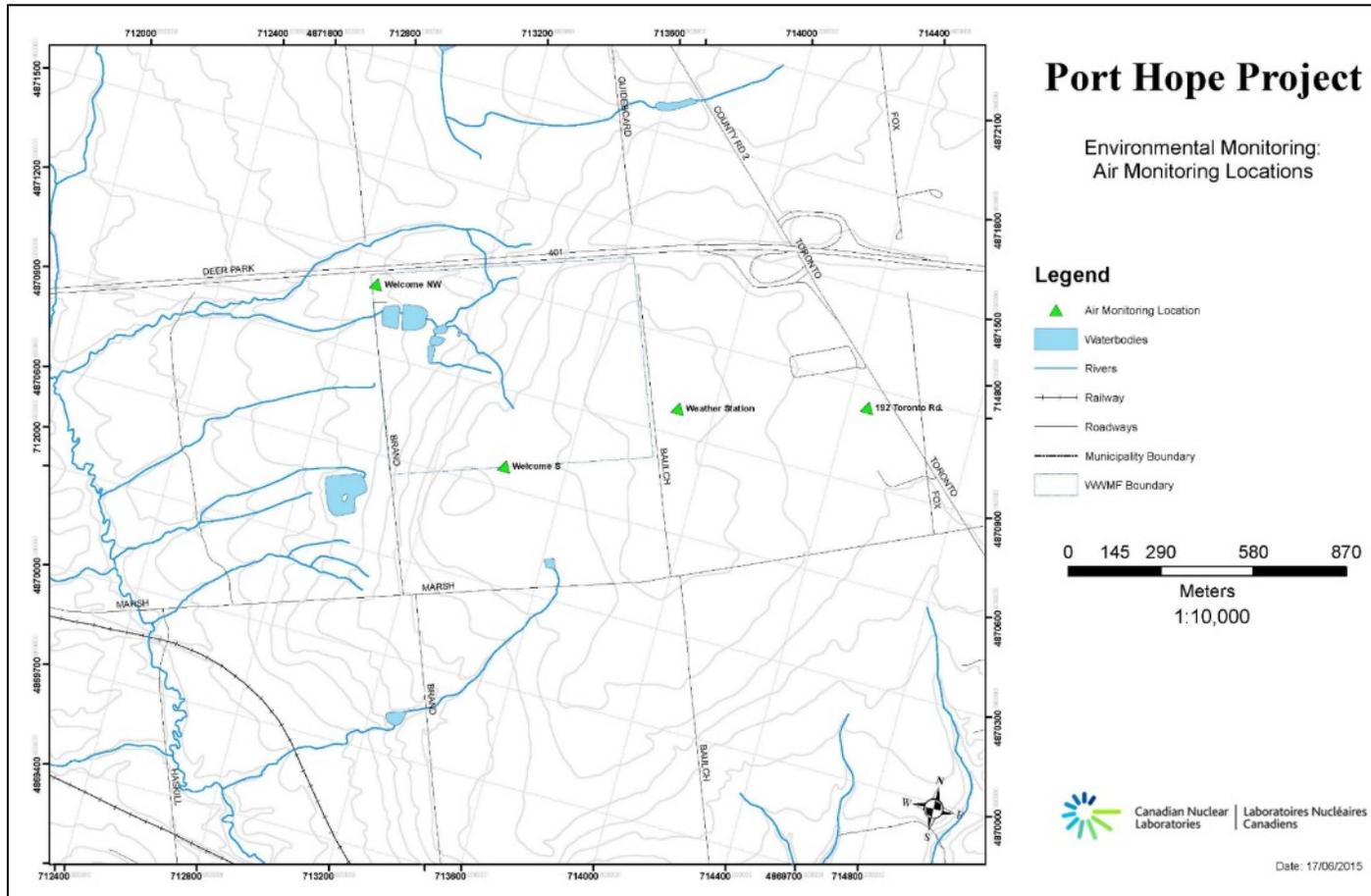


Figure 13: Port Hope Long-Term Waste Management Facility Air Monitoring Locations

Table 19: Port Hope Long-Term Waste Management Facility Air Quality Monitoring – 192 Toronto Road (Hi-Vol)

192 Toronto Road										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP						
	µg/m ³								µg/m ³	
Observations	170	166	221	17	225	171	237	213	236	234
Geometric Mean	5	19	7	24	8	22	11	27	6	19
Arithmetic Mean	8	21	9	29	11	25	21	36	8	22
Median	6	21	8	30	9	23	16	33	7	22
98th Percentile	19	-	20	-	24	-	55	-	54^a	-
Maximum	21	58	51	72	41	76	101	139	28	78
Exceedances	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%

Notes:

TSP values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].

PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].

Bold values indicate an exceedance of criteria.

a. Averaged over three years (current and previous two years).

-- indicates no data are available.

Table 20: Port Hope Long-Term Waste Management Facility Air Quality Monitoring – Northwest (Hi-Vol)

PH LTWMF Northwest										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP	PM _{2.5}	TSP	PM _{2.5}	TSP	PM _{2.5}	TSP
	µg/m ³								µg/m ³	
Observations	166	158	219	220	210	177	58	137	163	212
Geometric Mean	6	21	7	21	9	20	5	18	9	17
Arithmetic Mean	8	25	9	25	11	24	7	23	10	21
Median	6	22	8	21	9	21	5	19	10	21
98th Percentile	19	-	20	-	24	-	24	-	24 ^a	-
Maximum	21	179	52	97	27	95	30	112	28	68
Exceedances	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%

Notes:

TSP values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].

PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].

Bold values indicate an exceedance of criteria.

a. Averaged over three years (current and previous two years).

-- indicates no data are available.

Table 21: Port Hope Long-Term Waste Management Facility Air Quality Monitoring – South

PH LTWMF South										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP						
	µg/m ³								µg/m ³	
Observations	136	169	217	220	229	217	238	239	236	237
Geometric Mean	6	15	7	17	8	17	10	22	5	14
Arithmetic Mean	8	18	9	21	10	20	20	32	8	19
Median	8	17	9	18	9	19	16	26	6	17
98th Percentile	19	-	20	-	24	-	53	-	53 ^a	-
Maximum	22	73	53	84	26	52	102	147	29	66
Exceedances	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%

Notes:

TSP values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].

PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].

Bold values indicate an exceedance of the criteria.

a. Averaged over three years (current and previous two years).

-- indicates no data are available.

Table 22: Port Hope Long-Term Waste Management Facility Air Quality Monitoring – Weather Station

PH LTWMF Weather Station										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP						
	µg/m ³								µg/m ³	
Observations	171	169	223	222	232	227	239	239	235	229
Geometric Mean	5	18	7	19	8	21	10	25	6	18
Arithmetic Mean	8	22	9	24	11	26	20	37	9	25
Median	6	19	8	19	9	24	15	31	7	21
98th Percentile	20	-	20	-	24	-	55	-	55^a	-
Maximum	21	85	49	116	33	110	91	137	73	108
Exceedances	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%

Notes:

TSP values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].

PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].

Bold values indicate an exceedance of the criteria.

a. Averaged over three years (current and previous two years).

-- indicates no data are available.

Table 23: Port Hope Long-Term Waste Management Facility Metals and Radionuclides Concentrations in Total Suspended Particulates – 192 Toronto Road

192 Toronto Road										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	10	22	10	9	3	6
Arsenic	ng/m ³	300	-	-	2.8	3.3	2.3	2.9	3.0	3.7
Cobalt	ng/m ³	100	-	-	0.3	0.5	0.3	0.6	0.5	1.2
Copper	ng/m ³	50,000	-	-	12	11	8	14	18	60
Lead	ng/m ³	500	-	-	3	2	5	3	1	2
Nickel	ng/m ³	200	-	-	1	20	1	4	3	3
Uranium	ng/m ³	300	1.8	4,070	2.8	3.3	2.4	4.7	2.4	4.7
Radium-226	Bq/m ³	-	0.000049	0.05	0.000030	0.000029	0.000028	0.000031	0.000024	0.000032
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00006	0.00006	0.00006	0.00005	0.00006
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000056	0.000059	0.000056	0.000057	0.000047	0.000063
Secondary COPC										
Barium	ng/m ³	10,000	-	-	6	6	8	9	8	22
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.02	0.03	0.14	0.62
Boron	ng/m ³	120,000	-	-	11	12	11	12	10	13
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.2	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	0.87	1.17	1.12	1.14	0.92	1.27
Molybdenum	ng/m ³	120,000	-	-	2.9	4.6	2.3	3.5	2.6	7.6
Selenium	ng/m ³	10,000	-	-	4	3	3	3	19	25
Silver	ng/m ³	1,000	-	-	21	23	18	23	7	35
Vanadium	ng/m ³	20002,000	-	-	0.3	0.4	0.5	0.7	0.9	3.1

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Zinc	ng/m ³	12,000	-	-	23	16	16	26	26	56
<p>Notes: 2024 averages are based on 48 sampling results. Bold values indicate an exceedance of criteria.</p>										

Table 24: Port Hope Long-Term Waste Management Facility Metals and Radionuclides Concentrations in Total Suspended Particulates – Welcome Northwest

Welcome Northwest										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	8	9	11	15	6	12
Arsenic	ng/m ³	300	-	-	3.1	3.3	2.6	2.9	2.9	3.6
Cobalt	ng/m ³	100	-	-	0.4	0.3	0.3	0.3	0.5	1.2
Copper	ng/m ³	50,000	-	-	11	10	10	20	15	47
Lead	ng/m ³	500	-	-	3	2	4	3	3	17
Nickel	ng/m ³	200	-	-	1	3	1	1	1	3
Uranium	ng/m ³	300	1.8	4,070	3.0	2.9	2.8	3.1	2.3	3.5
Radium-226	Bq/m ³	-	0.000049	0.05	0.000030	0.000031	0.000028	0.000029	0.000024	0.000043
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00006	0.00007	0.00006	0.00005	0.00006
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000056	0.000062	0.000061	0.000057	0.000046	0.000063
Secondary COPC										
Barium	ng/m ³	10,000	-	-	11	7	9	7	9	17
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.03	0.03	0.14	0.61
Boron	ng/m ³	120,000	-	-	11	20	11	11	10	16
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.3	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	0.94	1.03	1.13	1.14	0.89	1.25
Molybdenum	ng/m ³	120,000	-	-	2.8	7.9	2.7	3.1	2.8	6.3
Selenium	ng/m ³	10,000	-	-	4	4	3	3	3	3
Silver	ng/m ³	1,000	-	-	22	22	21	23	19	25
Vanadium	ng/m ³	20002,000	-	-	0.4	0.4	0.4	0.3	0.9	3.0
Zinc	ng/m ³	12,000	-	-	23	21	22	29	25	44

Information Use

Notes:

2024 averages are based on 45 sampling results.

Bold values indicate an exceedance of criteria.

Table 25: Port Hope Long-Term Waste Management Facility Metals and Radionuclides Concentrations in Total Suspended Particulates – Welcome South

Welcome South										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	7	8	6	8	6	6
Arsenic	ng/m ³	300	-	-	3.0	3.2	2.5	2.9	3.0	3.6
Cobalt	ng/m ³	100	-	-	0.3	0.3	0.3	0.6	0.5	1.2
Copper	ng/m ³	50,000	-	-	12	10	10	17	18	63
Lead	ng/m ³	500	-	-	3	2	4	4	3	5
Nickel	ng/m ³	200	-	-	1	3	1	2	1	3
Uranium	ng/m ³	300	1.8	4,070	2.7	3.0	2.7	4.7	2.3	3.2
Radium-226	Bq/m ³	-	0.000049	0.05	0.000028	0.000032	0.000028	0.000029	0.000024	0.000041
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00006	0.00007	0.00006	0.00005	0.00006
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000056	0.000062	0.000060	0.000057	0.000047	0.000064
Secondary COPC										
Barium	ng/m ³	10,000	-	-	5	5	6	7	6	13
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.02	0.03	0.14	0.60
Boron	ng/m ³	120,000	-	-	11	22	11	11	10	13
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.2	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	0.87	1.04	1.13	1.13	0.92	1.27
Molybdenum	ng/m ³	120,000	-	-	3.4	6.7	2.4	3.2	2.7	4.2
Selenium	ng/m ³	10,000	-	-	4	4	3	4	3	3
Silver	ng/m ³	1,000	-	-	21	23	19	23	19	25
Vanadium	ng/m ³	2,000	-	-	0.3	0.4	0.3	0.6	0.9	3.0
Zinc	ng/m ³	12,000	-	-	19	18	17	25	22	56

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Notes:

2024 averages are based on 49 sampling results.

Bold values indicate an exceedance of criteria.

Table 26: Port Hope Long-Term Waste Management Facility Metals and Radionuclides Concentrations in Total Suspended Particulates – Welcome Weather Station

Welcome Weather Station										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	7	7	6	10	7	38
Arsenic	ng/m ³	300	-	-	3.1	3.2	2.5	3.0	3.0	3.7
Cobalt	ng/m ³	100	-	-	0.3	0.3	0.3	0.6	0.5	1.2
Copper	ng/m ³	50,000	-	-	13	11	12	18	18	35
Lead	ng/m ³	500	-	-	3	3	5	4	3	8
Nickel	ng/m ³	200	-	-	1	3	1	1	1	4
Uranium	ng/m ³	300	1.8	4,070	3.0	3.0	2.7	5.0	2.5	6.2
Radium-226	Bq/m ³	-	0.000049	0.05	0.000030	0.000033	0.000029	0.000031	0.000027	0.000114
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00006	0.00006	0.00006	0.00005	0.00012
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000059	0.000063	0.000061	0.000059	0.000048	0.000065
Secondary COPC										
Barium	ng/m ³	10,000	-	-	5	6	7	8	9	20
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.03	0.03	0.14	0.61
Boron	ng/m ³	120,000	-	-	12	21	12	12	10	13
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.3	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	0.89	1.06	1.15	1.18	0.93	1.30
Molybdenum	ng/m ³	120,000	-	-	2.8	3.5	2.5	3.6	2.9	6.6
Selenium	ng/m ³	10,000	-	-	4	4	3	4	3	13
Silver	ng/m ³	1,000	-	-	23	23	20	24	20	26
Vanadium	ng/m ³	2,000	-	-	0.4	0.4	0.5	0.7	1.0	3.1
Zinc	ng/m ³	12,000	-	-	24	19	19	26	29	125

Information Use

Notes:

2024 averages are based on 48 sampling results.

Bold values indicate an exceedance of criteria.

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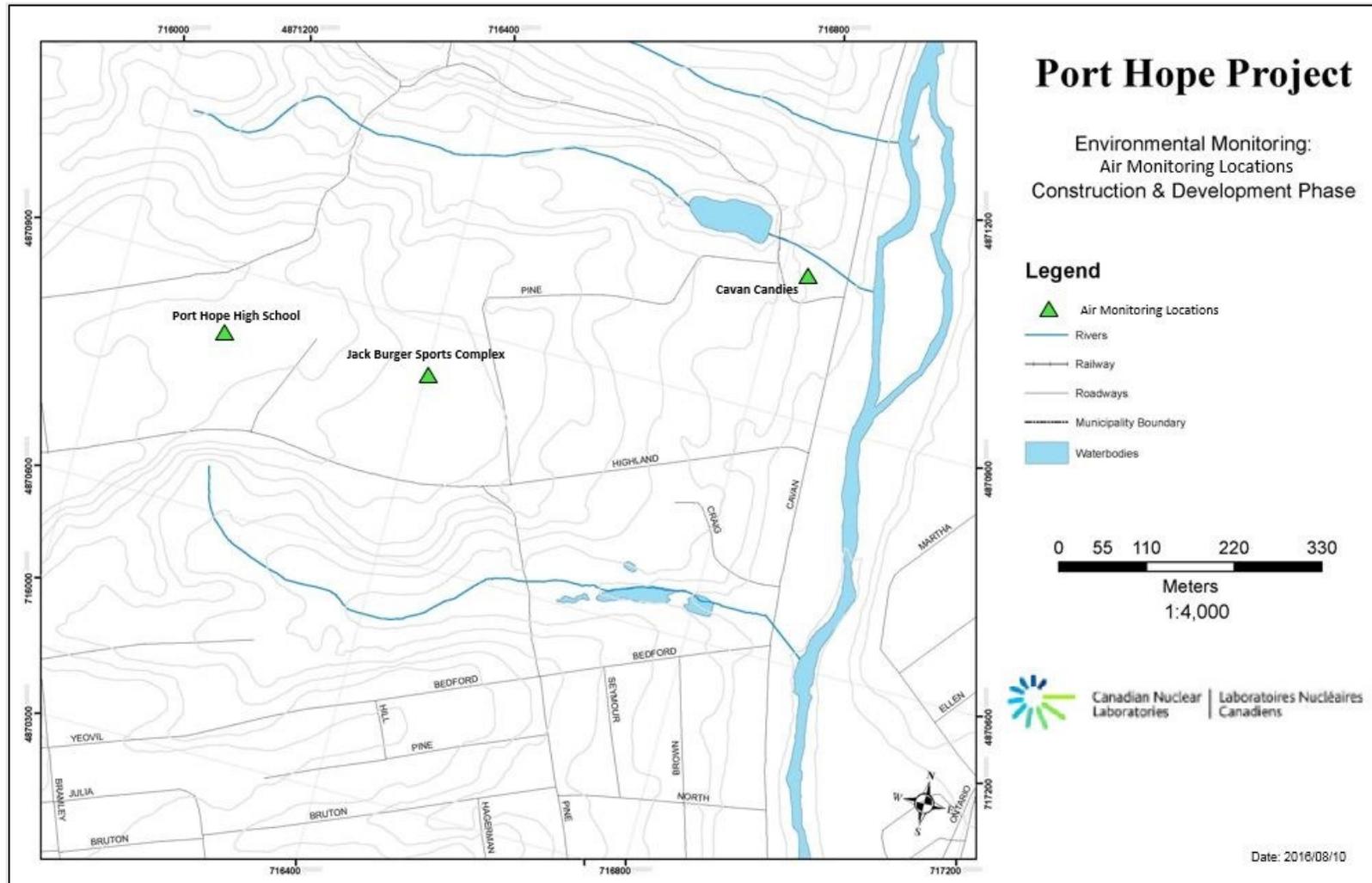


Figure 14: Port Hope Project Highland Drive and Vicinity Sites Air Monitoring Locations

Table 27: Highland Drive and Vicinity Sites Air Quality Monitoring – Cavan Candies (Hi-Vol)

Highland Drive – Cavan Candies										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP						
	µg/m ³								µg/m ³	
Observations	36	36	177	179	114	117	147	114	174	164
Geometric Mean	3	9	6	17	4	11	11	19	8	21
Arithmetic Mean	4	11	8	21	6	14	19	30	10	24
Median	3	10	8	20	5	12	18	20	9	25
98th Percentile	10	-	20	-	21	-	42	-	45^a	-
Maximum	11	22	53	83	25	39	58	110	30	68
Exceedances	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Notes:

TSP values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].
 PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].
Bold values indicate an exceedance of the criteria.
 a. Averaged over three years (current and previous two years).
 -- indicates no data are available.

Table 28: Highland Drive and Vicinity Sites Air Quality Monitoring – Cavan Candies (Mini-Vol)

Highland Drive – Cavan Candies (Mini-Vol – TSP only)		
	2023	2024
	TSP	TSP
	µg/m³	µg/m³
Observations	85	6
Geometric Mean	25	8
Arithmetic Mean	53	9
Median	28	8
98th Percentile	-	-
Maximum	175	14
Exceedances	21%	0%
Notes: TSP maximum values are compared to the Overriding Limit of 120 µg/m ³ [9] and AAQC [22]. Bold values indicate an exceedance of the criteria. - – indicates no data are available.		

Table 29: Highland Drive and Vicinity Sites Air Quality Monitoring – Jack Burger Sports Complex (Hi-Vol)

Highland Drive – Jack Burger Sports Complex										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP						
	µg/m ³								µg/m ³	
Observations	36	35	179	177	117	117	237	39	228	160
Geometric Mean	2	10	6	16	5	12	9	9	6	22
Arithmetic Mean	3	12	9	20	7	15	19	11	9	27
Median	2	11	8	17	5	14	14	11	7	26
98th Percentile	10	-	24	-	24	-	54	-	58^a	-
Maximum	13	45	52	89	24	40	85	29	30	67
Exceedances	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Notes:

TSP maximum values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].

PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].

Bold values indicate an exceedance of the criteria.

a. Averaged over three years (current and previous two years).

-- indicates no data are available.

**Table 30: Highland Drive and Vicinity Sites Air Quality Monitoring –
Jack Burger Sports Complex (Mini-Vol)**

Highland Drive – Jack Burger Sports Complex		
	2023	2024
	TSP	TSP
	µg/m³	µg/m³
Observations	150	37
Geometric Mean	24	11
Arithmetic Mean	47	14
Median	32	10
98th Percentile	-	-
Maximum	181	41
Exceedances	14%	0%
Notes: TSP maximum values are compared to the Overriding Limit of 120 µg/m ³ [9] and AAQC [22]. Bold values indicate an exceedance of the criteria. - – indicates no data are available.		

Table 31: Highland Drive and Vicinity Sites Air Quality Monitoring – Port Hope High School (Hi-Vol)

Highland Drive – Port Hope High School										
	2020		2021		2022		2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP						
	µg/m ³								µg/m ³	
Observations	36	34	177	172	115	114	237	236	228	231
Geometric Mean	3	9	7	15	4	11	9	18	5	12
Arithmetic Mean	4	11	9	19	6	13	19	29	8	18
Median	2	9	8	16	5	12	14	23	7	15
98th Percentile	12	-	23	-	24	-	55	-	56^a	-
Maximum	13	26	51	86	26	36	85	127	29	64
Exceedances	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Notes:

TSP maximum values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].
 PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].
Bold values indicates an exceedance of the criteria.
 a. Averaged over three years (current and previous two years).
 -- indicates no data are available.

Table 32: Highland Drive Metals and Radionuclides Concentrations in Total Suspended Particulates – Cavan Candies

Cavan Candies										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	11	7	7	16	4	6
Arsenic	ng/m ³	300	-	-	2.8	2.9	2.7	3.0	3.0	3.7
Cobalt	ng/m ³	100	-	-	0.3	0.3	0.3	0.7	0.5	1.2
Copper	ng/m ³	50,000	-	-	4	9	12	13	15	35
Lead	ng/m ³	500	-	-	3	3	3	4	1	2
Nickel	ng/m ³	200	-	-	1	2	1	1	2	3
Uranium	ng/m ³	300	1.8	4,070	3.0	2.9	3.0	4.8	2.2	4.9
Radium-226	Bq/m ³	-	0.000049	0.05	0.000028	0.000032	0.000028	0.000029	0.000023	0.000043
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00007	0.00005	0.00006	0.00004	0.00006
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000057	0.000062	0.000055	0.000057	0.000042	0.000062
Secondary COPC										
Barium	ng/m ³	10,000	-	-	4	6	10	9	10	36
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.03	0.03	0.17	0.61
Boron	ng/m ³	120,000	-	-	11	25	11	11	9	12
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.3	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	1.14	0.96	1.09	1.13	0.82	1.23
Molybdenum	ng/m ³	120,000	-	-	4.1	3.7	2.7	3.4	2.6	5.9
Selenium	ng/m ³	10,000	-	-	3	3	3	3	17	25
Silver	ng/m ³	1,000	-	-	23	22	22	23	6	11
Vanadium	ng/m ³	2,000	-	-	0.3	0.3	0.3	0.8	1.1	3.1
Zinc	ng/m ³	12,000	-	-	12	19	21	29	22	45

Notes:

2024 averages are based on 35 sampling results.

Bold values indicate an exceedance of criteria.

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Table 33: Highland Drive Metals and Radionuclides Concentrations in Total Suspended Particulates – Jack Burger Sports Complex

Jack Burger Sports Complex										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	11	7	7	10	4	6
Arsenic	ng/m ³	300	-	-	2.8	3.0	2.8	2.9	3.0	3.7
Cobalt	ng/m ³	100	-	-	0.3	0.3	0.3	0.4	0.5	1.2
Copper	ng/m ³	50,000	-	-	3	9	12	14	14	34
Lead	ng/m ³	500	-	-	3	2	3	3	1	2
Nickel	ng/m ³	200	-	-	1	2	1	1	3	4
Uranium	ng/m ³	300	1.8	4,070	2.8	3.0	3.0	4.1	2.2	5.8
Radium-226	Bq/m ³	-	0.000049	0.05	0.000028	0.000032	0.000029	0.000029	0.000023	0.000037
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00006	0.00006	0.00006	0.00005	0.00006
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000057	0.000063	0.000057	0.000057	0.000042	0.000061
Secondary COPC										
Barium	ng/m ³	10,000	-	-	3	5	7	7	8	24
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.03	0.03	0.18	0.62
Boron	ng/m ³	120,000	-	-	11	26	11	11	9	12
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.3	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	1.14	0.97	1.14	1.14	0.82	1.23
Molybdenum	ng/m ³	120,000	-	-	2.9	3.1	2.8	2.9	2.8	5.3
Selenium	ng/m ³	10,000	-	-	3	3	3	3	17	25
Silver	ng/m ³	1,000	-	-	23	22	23	23	6	6
Vanadium	ng/m ³	2,000	-	-	0.3	0.3	0.3	0.5	1.1	3.1
Zinc	ng/m ³	12,000	-	-	12	18	23	39	19	39

Notes:

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2024 averages are based on 33 sampling results.

Bold values indicate an exceedance of criteria.

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Table 34: Highland Drive Metals and Radionuclides Concentrations in Total Suspended Particulates – Port Hope High School

Port Hope High School										
Parameter	Unit of Measure	Criteria			2020	2021	2022	2023	2024	
		AAQC [22]	Predicted [20]	Health Canada Reference Level [20]	Average				Average	Maximum
Primary COPC										
Antimony	ng/m ³	25,000	-	-	10	7	11	10	4	6
Arsenic	ng/m ³	300	-	-	2.9	2.9	2.8	2.8	3.0	3.7
Cobalt	ng/m ³	100	-	-	0.3	0.4	0.3	0.5	0.5	1.2
Copper	ng/m ³	50,000	-	-	9	9	13	14	12	26
Lead	ng/m ³	500	-	-	3	3	4	3	1	4
Nickel	ng/m ³	200	-	-	1	2	2	2	3	3
Uranium	ng/m ³	300	1.8	4,070	3.0	2.9	3.5	4.2	2.1	3.1
Radium-226	Bq/m ³	-	0.000049	0.05	0.000029	0.000033	0.000029	0.000029	0.000022	0.000034
Thorium-230	Bq/m ³	-	0.00042	0.01	0.00006	0.00006	0.00006	0.00006	0.00005	0.00006
Thorium-232	Bq/m ³	-	0.000057	0.006	0.000057	0.000063	0.000057	0.000057	0.000043	0.000062
Secondary COPC										
Barium	ng/m ³	10,000	-	-	3	4	7	6	6	12
Beryllium	ng/m ³	10	-	-	0.03	0.03	0.03	0.03	0.17	0.62
Boron	ng/m ³	120,000	-	-	11	22	11	11	9	12
Cadmium	ng/m ³	25	-	-	0.3	0.3	0.3	0.3	0.5	1.2
Total Mercury	ng/m ³	-	-	-	1.14	0.97	1.14	1.13	0.83	1.23
Molybdenum	ng/m ³	120,000	-	-	2.9	11.3	2.9	3.4	2.4	4.5
Selenium	ng/m ³	10,000	-	-	3	3	3	3	17	25
Silver	ng/m ³	1,000	-	-	23	22	23	23	6	6
Vanadium	ng/m ³	2,000	-	-	0.3	0.3	0.3	0.6	1.1	3.1
Zinc	ng/m ³	12,000	-	-	14	17	22	22	18	32

Notes:

2024 averages are based on 47 sampling results.

Bold values indicate an exceedance of criteria.

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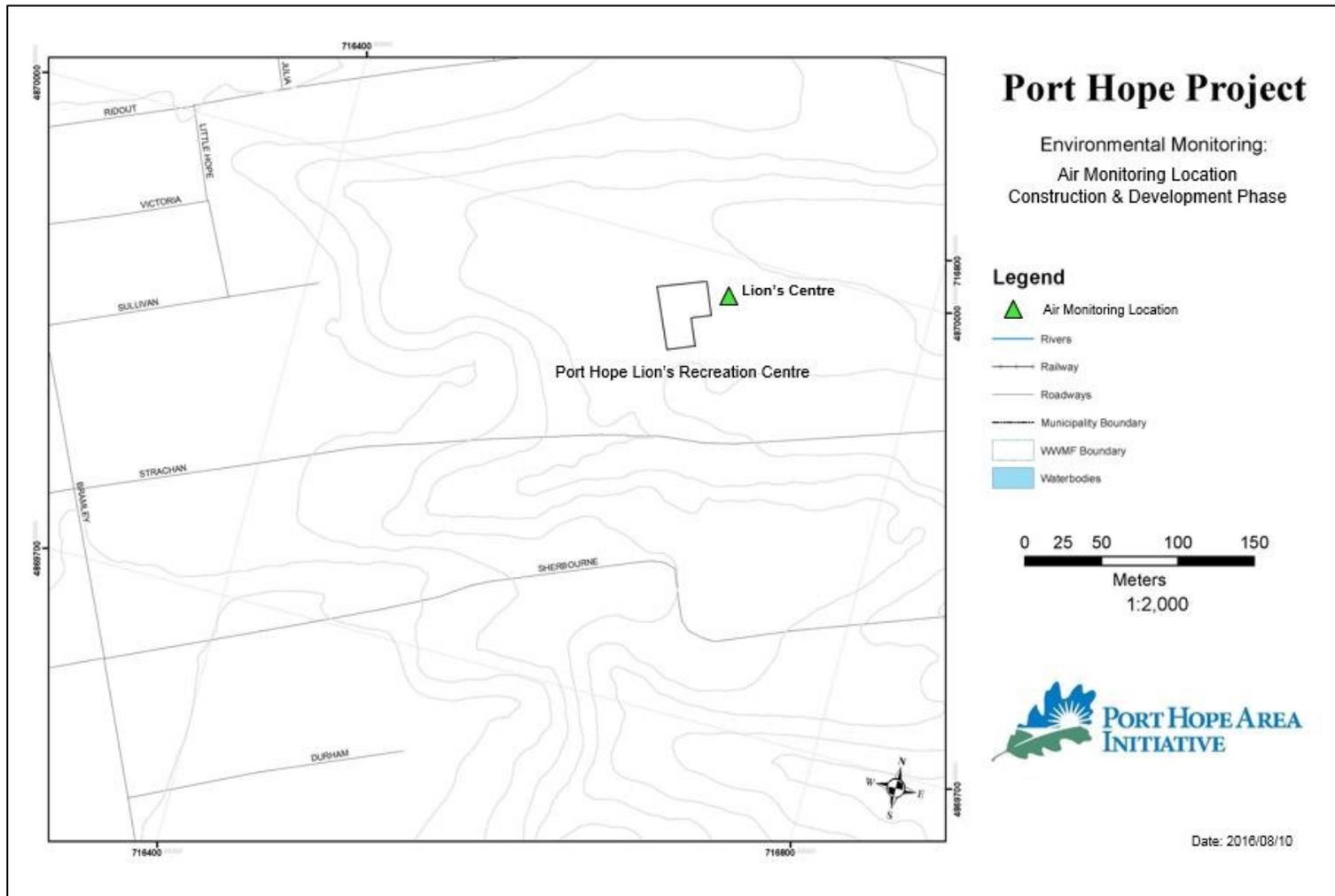


Figure 15: Port Hope Project Lions Recreation Centre Air Monitoring Locations

Table 35: Port Hope Lions Recreation Centre Air Quality Monitoring – (Mini-Vol)

Port Hope Lions Recreation Centre (Mini-Vol)				
	2023		2024	
	PM _{2.5}	TSP	PM _{2.5}	TSP
	µg/m ³		µg/m ³	
Observations	114	88	63	31
Geometric Mean	18	25	7	14
Arithmetic Mean	42	52	11	20
Median	6	32	6	16
98th Percentile	157	-	157^a	-
Maximum	174	159	187	57
Exceedances	20%	22%	2%	0%
<p>Notes:</p> <p>TSP maximum values are compared to the Overriding Limit of 120 µg/m³ [9] and AAQC [22].</p> <p>PM_{2.5} 98th percentile is compared to the 2000 Canadian Air Quality Standards for Fine Particulate Matter value of 30 µg/m³ and the proposed 2020 value of 27 µg/m³ [23].</p> <p>Bold values indicate an exceedance of the criteria.</p> <p>a. Averaged over two years (current and previous year).</p> <p>-- indicates no data are available.</p>				

Table 36: Harbour/Centre Pier Air Quality Monitoring – Volatile Organic Compounds – Downwind

Harbour/Centre Pier (HCP) Downwind Location						
			March to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average			Maximum
Dichlorodifluoromethane (FREON 12)	µg/m ³	500,000	2.2	1.8	2.2	2.5
1,2-Dichlorotetrafluoroethane (FREON 114)	µg/m ³	700,000	< 1.4	< 1.4	< 1.3	< 1.4
Vinyl Chloride	µg/m ³	1	< 0.5	< 0.5	< 0.2	< 0.5
Chloroethane	µg/m ³	5,600	< 0.53	< 0.53	< 0.70	< 0.79
1,3-Butadiene	µg/m ³	10	< 0.44	< 0.44	< 0.88	< 1.10
Trichlorofluoromethane (FREON 11)	µg/m ³	6,000	1.5	1.2	1.5	2.1
2-propanol (Isopropyl alcohol)	µg/m ³	7,300	2.3	9.7	2.7	80.0
2-Propanone (Acetone)	µg/m ³	11,880	9.7	10.0	5.7	23.0
Methyl Ethyl Ketone (2-Butanone)	µg/m ³	1,000	1.11	1.23	1.00	2.50
Methyl Isobutyl Ketone	µg/m ³	1,200	< 0.82	< 0.82	< 0.55	< 0.82
Methyl t-butyl ether (MTBE)	µg/m ³	7,000	< 0.72	< 0.72	< 0.48	< 0.72
cis-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.40	< 0.79
trans-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.53	< 0.79
Methylene Chloride (Dichloromethane)	µg/m ³	220	2.8	1.4	0.8	9.4
Chloroform	µg/m ³	1	< 0.98	< 0.98	< 0.47	< 0.98
Carbon Tetrachloride	µg/m ³	2.4	< 1.3	< 1.3	< 0.85	< 1.30
1,1-Dichloroethane	µg/m ³	165	< 0.81	< 0.81	< 0.40	< 0.81
Ethylene Dibromide	µg/m ³	3	< 1.50	< 1.51	< 0.56	1.54
1,1,1-Trichloroethane	µg/m ³	115,000	< 1.10	< 1.10	< 0.54	< 1.10
Bromoform	µg/m ³	55	< 2.10	< 2.09	< 1.36	2.10
Trichloroethylene	µg/m ³	12	< 0.32	< 0.21	< 0.25	1.40
Benzene	µg/m ³	2.3	< 0.73	< 0.64	< 0.54	1.20

Harbour/Centre Pier (HCP) Downwind Location						
			March to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average			Maximum
Toluene	µg/m ³	2,000	1.05	1.33	0.99	3.40
Ethyl benzene	µg/m ³	1,000	< 0.9	< 0.9	< 0.4	< 0.9
p+m-Xylene	µg/m ³	730	< 0.9	< 0.9	< 0.6	1.1
o-Xylene	µg/m ³	730	< 1	< 1	< 1	< 1
Styrene	µg/m ³	400	< 0.85	< 0.85	< 0.42	< 0.85
1,3,5-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	2.0	< 2.5
1,2,4-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	2.0	< 2.5
1,4-Dichlorobenzene (p)	µg/m ³	95	< 1.2	< 1.2	< 0.6	< 1.2
1,2-Dichlorobenzene (o)	µg/m ³	30,500	< 1.2	< 1.2	< 0.6	< 1.2
1,2,4-Trichlorobenzene	µg/m ³	400	< 1.50	< 2.14	< 1.46	< 4.00
Hexane	µg/m ³	7,500	1.86	0.91	0.78	6.00
Heptane	µg/m ³	11,000	< 0.83	< 0.82	< 1.1	< 1.2
Cyclohexane	µg/m ³	6,100	< 0.7	< 0.7	< 0.7	< 0.7
Tetrahydrofuran	µg/m ³	93,000	< 0.59	< 0.59	< 1.0	< 1.2
Naphthalene	µg/m ³	22.5	< 1.2	< 1.2	< 0.7	2.9
Total Xylenes	µg/m ³	730	< 0.87	< 0.88	< 0.80	1.56
Propene (Propylene)	µg/m ³	4,000	< 0.97	< 0.81	< 0.95	1.90

Note:
Bold values indicate an exceedance of the criteria.

Table 37: Harbour/Centre Pier Air Quality Monitoring – Volatile Organic Compounds – Upwind

Harbour/Centre Pier (HCP) Upwind Location						
			March to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average			Maximum
Dichlorodifluoromethane (FREON 12)	µg/m ³	500,000	2.1	1.8	2.2	2.6
1,2-Dichlorotetrafluoroethane (FREON 114)	µg/m ³	700,000	< 1.4	< 1.4	< 1.3	< 1.5
Vinyl Chloride	µg/m ³	1	< 0.5	< 0.5	< 0.2	< 0.5
Chloroethane	µg/m ³	5,600	< 0.53	< 0.53	< 0.70	< 0.79
1,3-Butadiene	µg/m ³	10	< 0.44	< 0.44	< 0.88	< 1.10
Trichlorofluoromethane (FREON 11)	µg/m ³	6,000	1.5	1.3	1.5	1.9
2-propanol (Isopropyl alcohol)	µg/m ³	7,300	1.0	1.8	2.0	11.0
2-Propanone (Acetone)	µg/m ³	11,880	5.8	11.2	4.7	19.0
Methyl Ethyl Ketone (2-Butanone)	µg/m ³	1,000	1.08	1.81	2.1	16.0
Methyl Isobutyl Ketone	µg/m ³	1,200	< 0.82	< 0.82	< 0.55	< 0.82
Methyl t-butyl ether (MTBE)	µg/m ³	7,000	< 0.72	< 0.72	< 0.48	< 0.72
cis-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.40	< 0.79
trans-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.53	< 0.79
Methylene Chloride (Dichloromethane)	µg/m ³	220	1.7	2.9	2.2	16.0
Chloroform	µg/m ³	1	< 0.98	< 0.98	< 0.46	< 0.98
Carbon Tetrachloride	µg/m ³	2.4	< 1.3	< 1.3	< 0.86	< 1.30
1,1-Dichloroethane	µg/m ³	165	< 0.81	< 0.81	< 0.40	< 0.81
Ethylene Dibromide	µg/m ³	3	< 1.50	< 1.51	< 0.56	1.54
1,1,1-Trichloroethane	µg/m ³	115,000	< 1.10	< 1.10	< 0.55	< 1.10
Bromoform	µg/m ³	55	< 2.10	< 2.1	< 1.4	< 2.1
Trichloroethylene	µg/m ³	12	< 0.22	< 0.21	< 0.25	0.31
Benzene	µg/m ³	2.3	< 0.65	< 0.64	< 0.53	0.77
Toluene	µg/m ³	2,000	1.07	1.17	0.81	2.40
Ethyl benzene	µg/m ³	1,000	< 0.9	< 0.9	< 0.4	< 0.9
p+m-Xylene	µg/m ³	730	< 0.9	< 0.9	< 0.6	< 0.9
o-Xylene	µg/m ³	730	< 1	< 1	0.45	< 1
Styrene	µg/m ³	400	< 0.85	< 0.85	< 0.42	< 0.85
1,3,5-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	2.0	< 2.5
1,2,4-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	2.0	< 2.5

Harbour/Centre Pier (HCP) Upwind Location						
			March to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average			Maximum
1,4-Dichlorobenzene (p)	µg/m ³	95	< 1.2	< 1.2	< 0.6	< 1.2
1,2-Dichlorobenzene (o)	µg/m ³	30,500	< 1.2	< 1.2	< 0.6	< 1.2
1,2,4-Trichlorobenzene	µg/m ³	400	< 1.50	< 1.69	< 1.22	< 4.00
Hexane	µg/m ³	7,500	1.04	2.71	2.33	20.00
Heptane	µg/m ³	11,000	< 0.82	< 0.82	< 1.1	< 1.2
Cyclohexane	µg/m ³	6,100	< 1	< 1	< 0.7	< 0.7
Tetrahydrofuran	µg/m ³	93,000	< 0.59	< 0.59	< 1.0	< 1.2
Naphthalene	µg/m ³	22.5	< 1.0	< 1.0	< 0.7	< 1.1
Total Xylenes	µg/m ³	730	< 0.87	< 0.87	< 0.75	1.01
Propene (Propylene)	µg/m ³	4,000	0.93	0.82	0.97	1.60
Note: Bold values indicate an exceedance of the criteria.						

Table 38: Highland Drive Air Quality Monitoring – Volatile Organic Compounds – Downwind

Highland Drive Downwind Location							
Parameter	Unit of Measure	Criteria (AAQC) [22]	January to March	April to June	July to September	October to December	2024
			Average				Maximum
Dichlorodifluoromethane (FREON 12)	µg/m ³	500,000	1.8	2.3	1.9	2.3	2.7
1,2-Dichlorotetrafluoroethane (FREON 114)	µg/m ³	700,000	< 1.4	< 1.4	< 1.413	< 1.3	< 1.5
Vinyl Chloride	µg/m ³	1.0	< 0.5	< 0.5	< 0.5	< 0.7	< 0.8
Chloroethane	µg/m ³	5,600	< 0.51	< 0.51	< 0.51	< 0.15	< 0.54
1,3-Butadiene	µg/m ³	10	< 0.44	< 0.44	< 0.44	< 0.95	< 1.10
Trichlorofluoromethane (FREON 11)	µg/m ³	6,000	1.4	1.5	1.4	1.6	2.2
2-propanol (Isopropyl alcohol)	µg/m ³	7,300	0.8	22.1	0.7	2.5	278.0
2-Propanone (Acetone)	µg/m ³	11,880	5.9	9.5	8.7	4.3	24.0
Methyl Ethyl Ketone (2-Butanone)	µg/m ³	1,000	0.66	1.24	1.27	0.8	2.8
Methyl Isobutyl Ketone	µg/m ³	1,200	< 0.82	< 0.82	< 0.82	< 0.50	< 0.86
Methyl t-butyl ether (MTBE)	µg/m ³	7,000	< 0.72	< 0.72	< 0.72	< 0.44	< 0.76
cis-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.79	< 0.43	< 1.41
trans-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.79	< 0.49	< 0.83
Methylene Chloride (Dichloromethane)	µg/m ³	220	8.7	9.3	2.9	1.8	91.0
Chloroform	µg/m ³	1.0	< 0.98	< 0.98	< 0.98	< 0.37	< 1.0
Carbon Tetrachloride	µg/m ³	2.4	< 1.3	< 1.30	< 1.3	< 0.78	< 1.30
1,1-Dichloroethane	µg/m ³	165	< 0.81	< 0.81	< 0.81	< 0.34	< 0.85
Ethylene Dibromide	µg/m ³	3.0	< 1.50	< 1.51	< 1.52	< 0.44	< 1.60
1,1,1-Trichloroethane	µg/m ³	115,000	< 1.10	< 1.10	< 1.10	< 0.45	< 1.10
Bromoform	µg/m ³	55	< 2.10	2.11	2.09	1.24	2.20
Trichloroethylene	µg/m ³	12	< 0.21	< 0.42	< 0.30	< 1.17	< 5.49
Benzene	µg/m ³	2.3	< 0.65	< 0.65	< 0.65	< 0.48	< 0.77
Toluene	µg/m ³	2,000	0.79	1.17	1.19	1.11	4.50
Ethyl benzene	µg/m ³	1,000	< 0.9	< 0.9	< 0.9	< 0.4	< 1.0
p+m-Xylene	µg/m ³	730	< 0.9	< 1.0	< 1.0	< 1.0	< 2.1
o-Xylene	µg/m ³	730	< 1	< 1	< 1	< 1	1

Highland Drive Downwind Location							
			January to March	April to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average				Maximum
Styrene	µg/m ³	400	< 0.85	< 0.85	< 0.85	0.36	< 0.89
1,3,5-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	< 1.0	2.2	2.5
1,2,4-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.2	< 1.2	2.6	4.5
1,4-Dichlorobenzene (p)	µg/m ³	95	< 1.20	1.21	< 1.20	< 0.50	< 1.30
1,2-Dichlorobenzene (o)	µg/m ³	30,500	< 1.20	1.21	1.21	< 0.50	< 1.30
1,2,4-Trichlorobenzene	µg/m ³	400	< 1.50	< 1.51	< 2.25	< 1.73	< 4.00
Hexane	µg/m ³	7,500	7.60	1.57	1.71	1.33	37.70
Heptane	µg/m ³	11,000	0.82	0.82	< 0.85	1.13	1.30
Cyclohexane	µg/m ³	6,100	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Tetrahydrofuran	µg/m ³	93,000	< 0.59	0.62	< 0.59	1.06	1.20
Naphthalene	µg/m ³	22.5	< 1.0	< 1.0	1.1	0.6	1.5
Total Xylenes	µg/m ³	730	< 0.87	< 1.06	< 1.13	1.48	3.27
Propene (Propylene)	µg/m ³	4,000	< 0.86	< 0.86	0.77	0.78	1.22

Note:
Bold values indicate an exceedance of the criteria.

Table 39: Highland Drive Air Quality Monitoring – Volatile Organic Compounds – Upwind

Highland Drive Upwind Location							
			January to March	April to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average				Maximum
Dichlorodifluoromethane (FREON 12)	µg/m ³	500,000	1.7	2.3	1.9	2.2	2.5
1,2-Dichlorotetrafluoroethane (FREON 114)	µg/m ³	700,000	< 1.4	< 1.4	< 1.4	< 1.3	< 1.4
Vinyl Chloride	µg/m ³	1.0	< 1.0	< 1.2	< 0.9	< 0.9	1.4
Chloroethane	µg/m ³	5,600	< 0.51	< 0.51	< 0.51	0.18	< 0.51
1,3-Butadiene	µg/m ³	10	< 0.44	< 0.44	< 0.44	< 0.91	< 1.10
Trichlorofluoromethane (FREON 11)	µg/m ³	6,000	1.3	1.8	1.2	1.4	2.6
2-propanol (Isopropyl alcohol)	µg/m ³	7,300	1.4	1.2	0.9	1.9	8.8
2-Propanone (Acetone)	µg/m ³	11,880	4.7	7.4	12.9	4.4	38.0
Methyl Ethyl Ketone (2-Butanone)	µg/m ³	1,000	0.65	1.05	1.41	0.6	3.5
Methyl Isobutyl Ketone	µg/m ³	1,200	< 0.82	< 0.82	< 0.82	< 0.53	< 0.82
Methyl t-butyl ether (MTBE)	µg/m ³	7,000	< 0.72	< 0.72	< 0.72	< 0.46	< 0.72
cis-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.79	< 0.37	< 0.79
trans-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79	< 0.79	< 0.51	< 0.79
Methylene Chloride (Dichloromethane)	µg/m ³	220	3.4	10.1	2.8	0.9	38.2
Chloroform	µg/m ³	1.0	< 0.98	< 0.98	< 0.98	< 0.45	1.20
Carbon Tetrachloride	µg/m ³	2.4	< 1.3	< 1.30	< 1.3	< 0.81	< 1.30
1,1-Dichloroethane	µg/m ³	165	< 0.81	< 0.81	< 0.81	< 0.37	< 0.81
Ethylene Dibromide	µg/m ³	3.0	< 1.50	< 1.50	< 1.51	< 0.48	1.54
1,1,1-Trichloroethane	µg/m ³	115,000	< 1.10	< 1.10	< 1.10	< 0.51	< 1.10
Bromoform	µg/m ³	55	< 2.10	< 2.10	< 2.09	< 1.31	< 2.10
Trichloroethylene	µg/m ³	12	< 0.21	< 0.21	< 0.21	< 0.76	3.81
Benzene	µg/m ³	2.3	< 0.64	< 0.65	< 0.64	< 0.48	0.80

Highland Drive Upwind Location							
			January to March	April to June	July to September	October to December	2024
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average				Maximum
Toluene	µg/m ³	2,000	0.85	0.93	1.05	0.64	2.30
Ethyl benzene	µg/m ³	1,000	< 0.9	< 0.9	< 0.9	< 0.4	< 0.9
p+m-Xylene	µg/m ³	730	< 0.9	< 0.9	< 1.1	< 0.7	2.3
o-Xylene	µg/m ³	730	< 1	< 1	< 1	1	1
Styrene	µg/m ³	400	< 0.85	< 0.85	< 0.85	< 0.39	< 0.85
1,3,5-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	< 1.0	2.1	< 2.5
1,2,4-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0	< 1.2	2.4	4.5
1,4-Dichlorobenzene (p)	µg/m ³	95	< 1.20	< 1.20	< 1.20	< 0.56	< 1.20
1,2-Dichlorobenzene (o)	µg/m ³	30,500	< 1.20	< 1.20	< 1.20	< 0.56	< 1.20
1,2,4-Trichlorobenzene	µg/m ³	400	< 1.50	< 1.50	< 2.00	< 0.96	< 4.00
Hexane	µg/m ³	7,500	2.38	6.01	2.57	0.54	24.00
Heptane	µg/m ³	11,000	< 0.82	< 0.82	< 0.82	< 1.09	< 1.20
Cyclohexane	µg/m ³	6,100	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Tetrahydrofuran	µg/m ³	93,000	< 0.59	< 1.39	< 0.59	1.03	11.00
Naphthalene	µg/m ³	22.5	< 1.0	< 1.0	< 1.0	0.7	1.3
Total Xylenes	µg/m ³	730	< 0.87	< 0.88	< 1.12	0.92	2.90
Propene (Propylene)	µg/m ³	4,000	< 0.86	< 0.86	0.76	0.96	1.30

Note:
Bold values indicate an exceedance of the criteria.

**Table 40: Chemetron Lagoon Air Quality Monitoring – Volatile Organic Compounds –
Downwind**

Chemetron Lagoon Downwind Location			January 2024	
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average	Maximum
Acetone (2-Propanone)	µg/m ³	11,880	3.6	4.3
1,3-Butadiene	µg/m ³	2.0	< 0.44	< 0.44
Benzene	µg/m ³	2.3	0.7	1.0
Bromoform	µg/m ³	55	< 2.1	< 2.10
Chloroform	µg/m ³	1.0	< 0.98	< 0.98
Chloromethane	µg/m ³	5,600	1.0	1.1
Carbon Tetrachloride	µg/m ³	2.4	< 1.3	< 1.3
Cyclohexane	µg/m ³	6,100	< 0.7	< 0.7
1,1-Dichloroethane	µg/m ³	165	< 0.81	< 0.8
1,2-Dibromoethane (EDB)	µg/m ³	3.0	< 1.5	< 1.50
trans-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79
cis-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79
o-Dichlorobenzene	µg/m ³	30,500	< 1.2	< 1.2
p-Dichlorobenzene	µg/m ³	95	< 1.2	< 1.2
Ethylbenzene	µg/m ³	1,000	< 0.87	< 0.9
Freon 114	µg/m ³	700,000	< 1.4	< 1.4
Heptane	µg/m ³	11,000	< 0.82	< 0.82
Hexane	µg/m ³	7,500	0.78	1.10
Isopropyl Alcohol	µg/m ³	7,300	< 0.52	0.59
Methylene Chloride	µg/m ³	220	0.91	1.50
Methyl Ethyl Ketone	µg/m ³	1,000	< 0.59	< 0.59
Methyl Isobutyl Ketone	µg/m ³	1,200	< 0.82	< 0.82
Methyl Tert Butyl Ether	µg/m ³	7,000	< 0.72	< 0.72
Naphthalene	µg/m ³	22.5	< 1.0	< 1.0
Propylene	µg/m ³	4,000	< 0.9	< 0.9
Styrene	µg/m ³	400	< 1	< 1
1,1,1-Trichloroethane	µg/m ³	115,000	< 1.1	< 1.1
1,2,4-Trichlorobenzene	µg/m ³	400	< 1.5	< 1.5
1,2,4-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/m ³	220	< 0.98	< 0.98
Tetrahydrofuran	µg/m ³	93,000	< 0.59	< 0.59
Toluene	µg/m ³	2,000	< 0.79	0.94
Trichloroethylene	µg/m ³	12	< 0.21	< 0.21

Chemetron Lagoon Downwind Location

Parameter	Unit of Measure	Criteria (AAQC) [22]	January 2024	
			Average	Maximum
Trichlorofluoromethane	$\mu\text{g}/\text{m}^3$	6,000	1.24	1.50
Vinyl Chloride	$\mu\text{g}/\text{m}^3$	1.0	< 0.5	< 0.5
m,p-Xylene	$\mu\text{g}/\text{m}^3$	730	< 0.87	< 0.87
o-Xylene	$\mu\text{g}/\text{m}^3$	730	< 0.87	< 0.87
Xylenes (total)	$\mu\text{g}/\text{m}^3$	730	< 0.87	< 0.87

Note:

Bold values indicate an exceedance of the criteria.

Table 41: Chemetron Lagoon Air Quality Monitoring – Volatile Organic Compounds – Upwind

Chemetron Lagoon Upwind Location			January 2024	
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average	Maximum
Acetone (2-Propanone)	µg/m ³	11,880	4.2	5.2
1,3-Butadiene	µg/m ³	2.0	< 0.44	< 0.44
Benzene	µg/m ³	2.3	0.7	1.0
Bromoform	µg/m ³	55	< 2.1	< 2.1
Chloroform	µg/m ³	1.0	< 0.98	< 0.98
Chloromethane	µg/m ³	5,600	1.0	1.1
Carbon Tetrachloride	µg/m ³	2.4	< 1.3	< 1.3
Cyclohexane	µg/m ³	6,100	< 0.7	< 0.7
1,1-Dichloroethane	µg/m ³	165	< 0.81	< 0.8
1,2-Dibromoethane (EDB)	µg/m ³	3.0	< 1.5	< 1.5
trans-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79
cis-1,2-Dichloroethylene	µg/m ³	105	< 0.79	< 0.79
o-Dichlorobenzene	µg/m ³	30,500	< 1.2	< 1.2
p-Dichlorobenzene	µg/m ³	95	< 1.2	< 1.2
Ethylbenzene	µg/m ³	1,000	< 0.87	< 0.87
Freon 114	µg/m ³	700,000	< 1.4	< 1.4
Heptane	µg/m ³	11,000	< 0.82	< 0.82
Hexane	µg/m ³	7,500	< 0.70	< 0.70
Isopropyl Alcohol	µg/m ³	7,300	0.52	0.59
Methylene Chloride	µg/m ³	220	< 0.69	< 0.69
Methyl Ethyl Ketone	µg/m ³	1,000	< 0.60	< 0.62
Methyl Isobutyl Ketone	µg/m ³	1,200	< 0.82	< 0.82
Methyl Tert Butyl Ether	µg/m ³	7,000	< 0.72	< 0.72
Naphthalene	µg/m ³	22.5	< 1.0	< 1.0
Propylene	µg/m ³	4,000	< 0.9	< 0.9
Styrene	µg/m ³	400	< 1	< 1
1,1,1-Trichloroethane	µg/m ³	115,000	< 1.1	< 1.1
1,2,4-Trichlorobenzene	µg/m ³	400	< 1.5	< 1.5
1,2,4-Trimethylbenzene	µg/m ³	220	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/m ³	220	< 0.98	< 0.98
Tetrahydrofuran	µg/m ³	93,000	< 0.59	< 0.59
Toluene	µg/m ³	2,000	< 0.75	< 0.75
Trichloroethylene	µg/m ³	12	< 0.21	< 0.21

Chemetron Lagoon Upwind Location				
			January 2024	
Parameter	Unit of Measure	Criteria (AAQC) [22]	Average	Maximum
Trichlorofluoromethane	$\mu\text{g}/\text{m}^3$	6,000	1.22	1.40
Vinyl Chloride	$\mu\text{g}/\text{m}^3$	1.0	< 0.5	< 0.5
m,p-Xylene	$\mu\text{g}/\text{m}^3$	730	0.96	1.30
o-Xylene	$\mu\text{g}/\text{m}^3$	730	< 0.87	< 0.87
Xylenes (total)	$\mu\text{g}/\text{m}^3$	730	0.96	1.30
Note: Bold values indicate an exceedance of the criteria.				

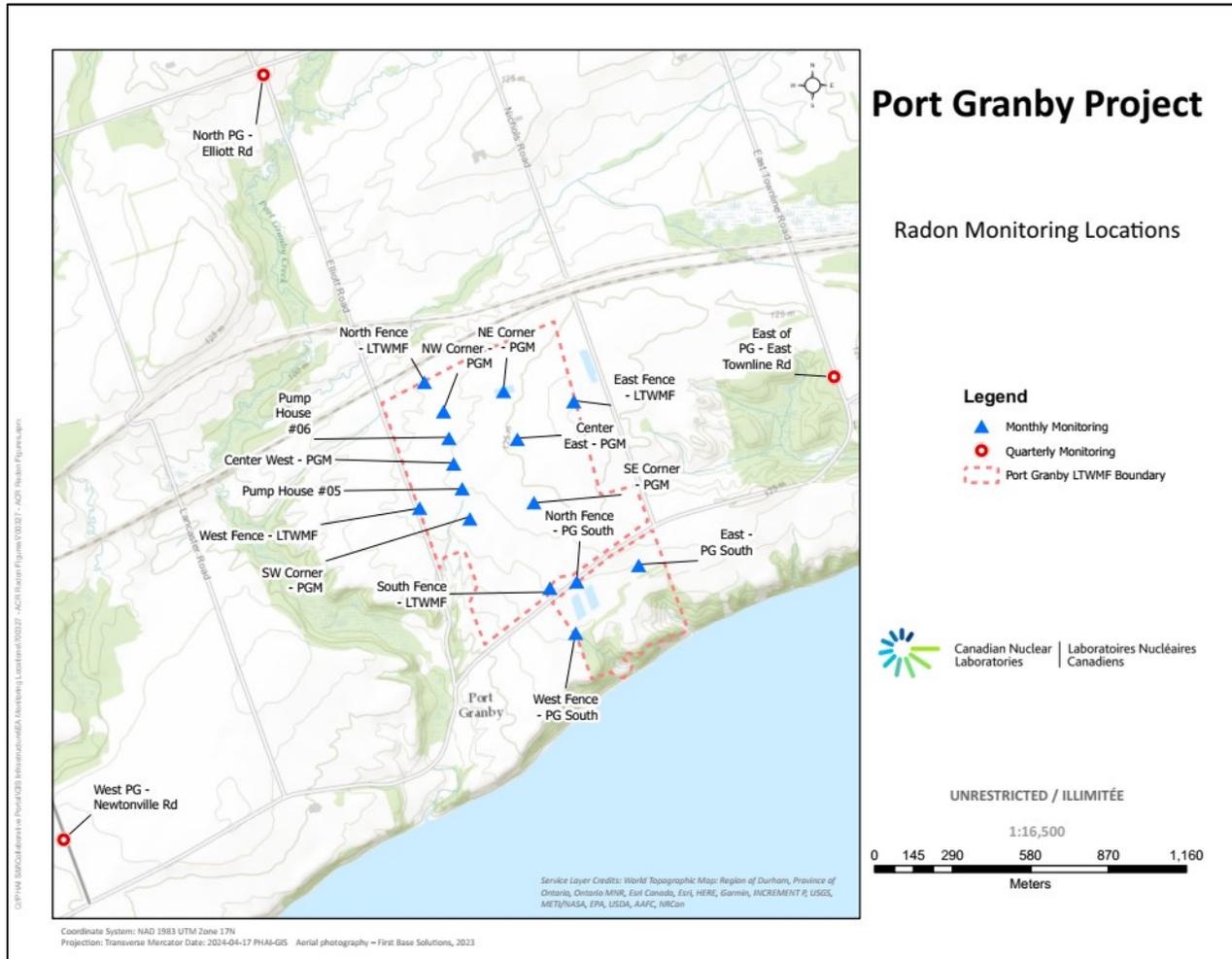


Figure 16: Port Granby Long-Term Waste Management Facility – Radon Monitoring Locations (Maintenance and Monitoring Phase)

Table 42: Port Granby Project- Summary Results of Radon Monitoring – 2024

	PG LTWMF (4 locations)	PG South (3 locations)	PG Community (3 locations)	PG Engineered Containment System (8 locations)
Total No. of Samples	48	36	12	96
Maximum (Bq/m³)	407	255	56	496
Average (Bq/m³)	126	114	35.75	137.11
% of Samples Exceeding Criteria	21%	17%	0%	27%

Notes:

The laboratory method detection limit is 7 Bq/m³

Bold font indicates value exceeds the investigative threshold (Administrative Control Level) of 150 Bq/m³

Dose assessment was performed to all readings that exceeded the Administrative Control Level and confirmed no exceedance to public dose limit.

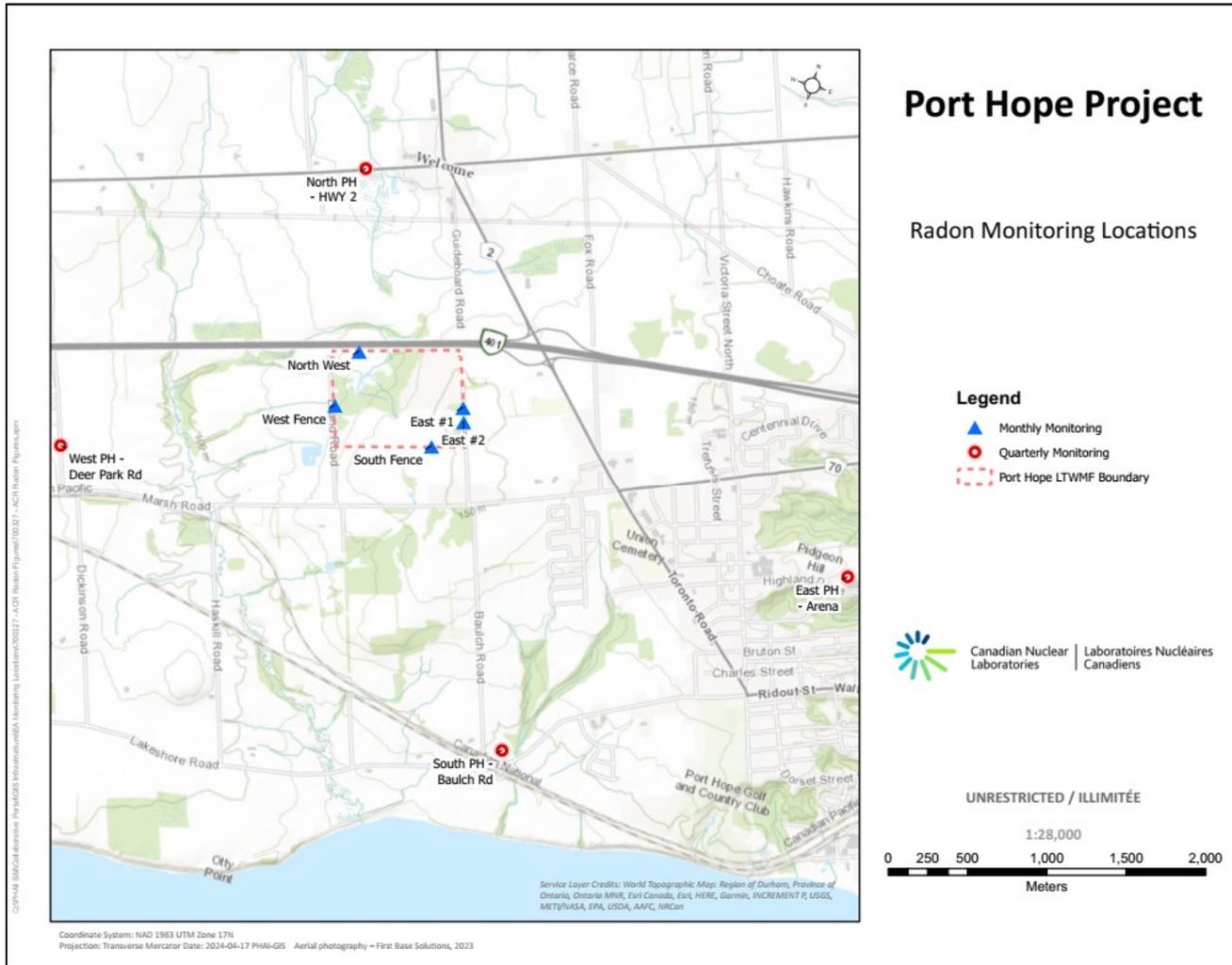


Figure 17: Port Hope Long-Term Waste Management Facility – Radon Monitoring Locations

Table 43: Port Hope Project – Summary Results of Radon Monitoring – 2024

	PH LTWMF (5 locations)	PH Community (2 km radius PH LTWMF) (4 locations)	PH Centre Pier/Harbor (5 locations)	Highland Drive Landfill (4 locations)	West Beach (4 locations)
Total No. of Samples	60	16	20	44	4
Maximum (Bq/m³)	525	78	54	109	15
Average (Bq/m³)	138.93	51.75	16.65	38.05	15
% of Samples Exceeding Criteria	32%	0%	0%	0%	0%

Notes:

The laboratory method detection limit is 7 Bq/m³.

Bold font indicates value exceeds the investigative threshold (Administrative Control Level) of 150 Bq/m³.

Dose assessment was performed to all readings that exceeded the Administrative Control Level and confirmed no exceedance to public dose limit.

Table 44: Summary Results of Radon Monitoring – Pine Street Extension Temporary Storage Site-2024

Pine Street Extension Temporary Storage Site				
	Pad-1 NW	Pad-1 SE	Pad-2 E	Pad-2 N
Unit of Measure	Bq/m³			
2024 Average	40			
First Quarter (January to March)	26	18	18	30
Second Quarter (April to June)	52	44	30	41
Third Quarter (July to September)	30	44	41	70
Fourth Quarter (October to December)	56	59	37	44
Notes:				
The laboratory method detection limit is 7 Bq/m ³				
Bold font indicates value exceeds the investigative threshold (Administrative Control Level) of 150 Bq/m ³ .				
The annual average from background locations was 34.2 Bq/m ³ .				

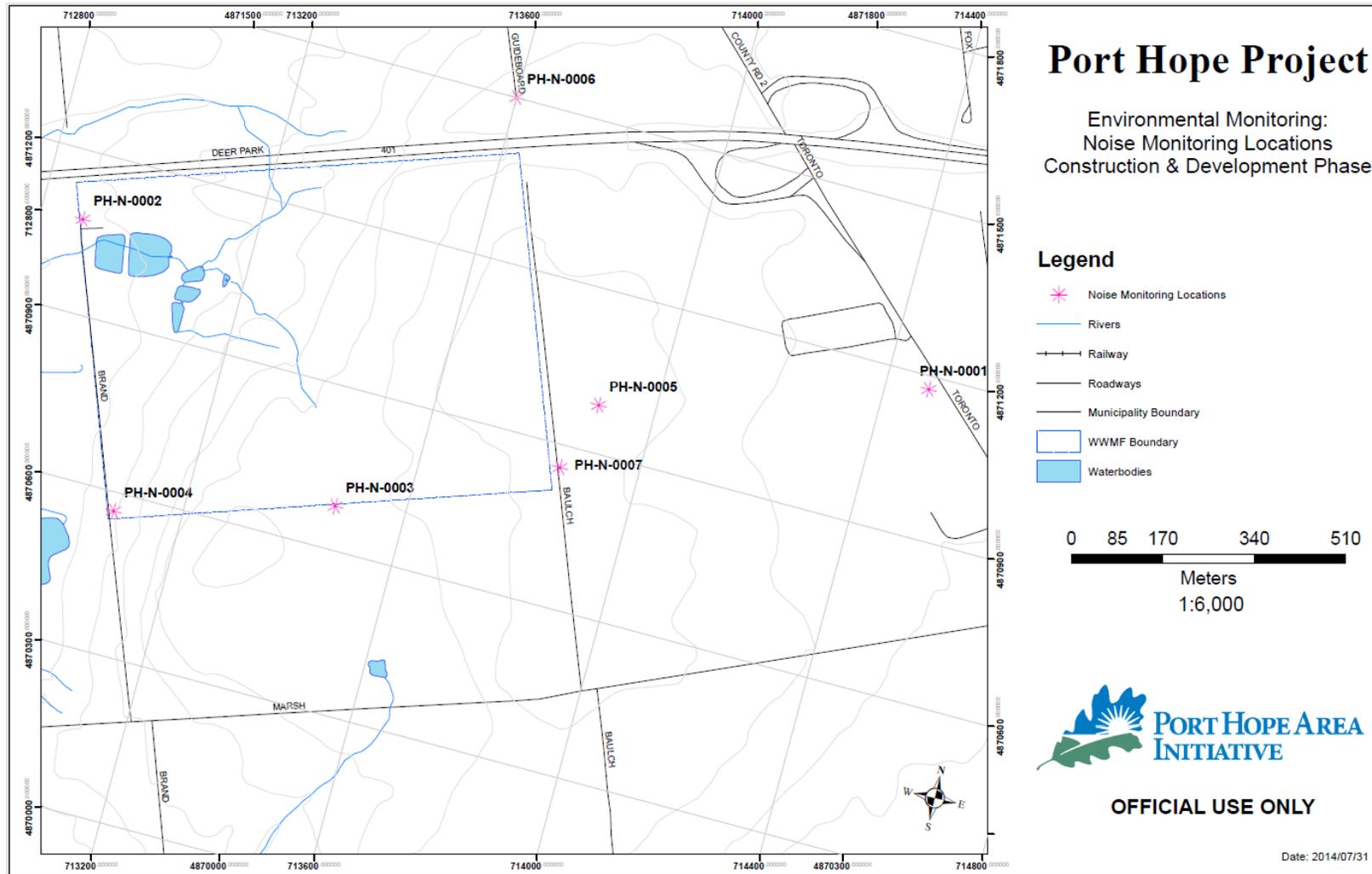


Figure 18: Port Hope Long-Term Waste Management Facility Noise Monitoring Locations

Table 45: Port Hope Long-Term Waste Management Facility Noise Monitoring

PH LTWMF								
Monitoring Location	Time of Measurement	Criteria Baseline (2015) ^a	L _{eq} (dBA)					
			2020	2021	2022	2023	2024	
			Average				Average	Maximum
PH-N-0001	Day (07:00-19:00)	63	65	66	65	67	68	69
	Evening (19:00-23:00)	61	62	61	61	62	63	65
	Night (23:00-07:00)	59	59	60	59	60	62	64
PH-N-0002	Day (07:00-19:00)	66	65	64	62	63	65	67
	Evening (19:00-23:00)	67	66	64	62	64	65	66
	Night (23:00-07:00)	64	63	63	61	62	63	64
PH-N-0003	Day (07:00-19:00)	52	53	54	55	54	58	64
	Evening (19:00-23:00)	53	52	52	56	53	53	56
	Night (23:00-07:00)	52	49	51	54	51	53	57
PH-N-0004	Day (07:00-19:00)	56	56	56	54	55	57	58
	Evening (19:00-23:00)	55	58	54	55	54	56	59
	Night (23:00-07:00)	53	55	54	54	53	56	60
PH-N-0005	Day (07:00-19:00)	54	57	58	57	60	66	83
	Evening (19:00-23:00)	54	52	53	53	53	56	67
	Night (23:00-07:00)	52	50	55	53	52	55	63
PH-N-0006	Day (07:00-19:00)	62	64	67	66	66	67	71
	Evening (19:00-23:00)	61	65	67	66	65	67	69
	Night (23:00-07:00)	58	63	65	64	63	65	67
PH-N-0007	Day (07:00-19:00)	-	56	55	55	56	57	59
	Evening (19:00-23:00)	-	52	55	55	52	53	57
	Night (23:00-07:00)	-	52	54	54	52	53	57

Notes:

Noise monitoring are results compared to:

The WHO [27] guideline recommends <70 dBA in a 24-hour period.

a. 12 dBA difference from Baseline (2015) monitoring results [20].

L_{eq} - ; - - indicates no data are available.

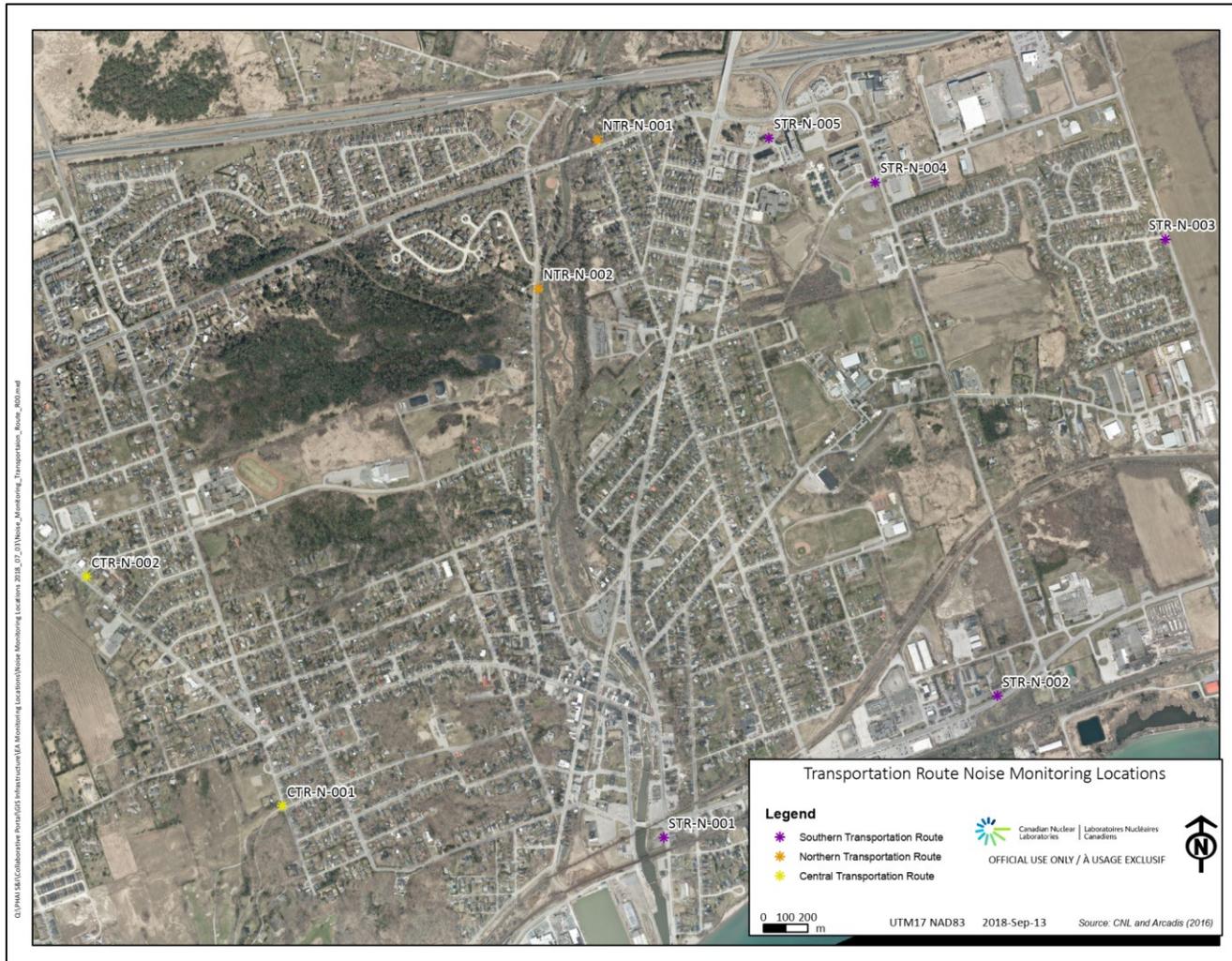


Figure 19: Port Hope Project Transportation Route Noise Monitoring Locations

Table 46: Port Hope Project Central, North and South Transportation Routes Noise Monitoring

Port Hope Transportation Routes							
		Leq (dBA)					
Time of Measurements		Day (07:00-19:00)					
Monitoring Location	Criteria	2020	2021	2022	2023	2024	
	Baseline (2018)	Average				Average	Maximum
Central - CTR-N-001	61 ^a	62	64	64	64	64	64
Central - CTR-N-002	69 ^a	69	69	69	69	68	69
North - NTR-N-001	63 ^b	62	62	64	62	62	63
North - NTR-N-002	62 ^b	65	68	65	64	65	67
South - STR-N-001	70 ^b	70	69	69	69	68	69
South - STR-N-002	69 ^b	70	70	69	69	68	70
South - STR-N-003	68 ^b	68	68	68	67	68	69
South - STR-N-004	63 ^b	65	65	64	64	64	66
South - STR-N-005	61 ^b	61	61	61	60	61	62

Notes:
Noise monitoring are results compared to:
The WHO [27] guideline recommends <70 dBA in a 24-hour period.
a. 12 dBA difference from Baseline (2018) monitoring results [20].
b. 1 to 2 dBA difference from Baseline (2018) monitoring results [20].



Figure 20: Port Hope Project Highland Drive and Vicinity Sites Noise Monitoring Locations

Table 47: Highland Drive and Vicinity Sites Noise Monitoring

Highland Drive and Vicinity Sites								
		L _{eq} (dBA)						
Monitoring Location	Time of Measurement	Criteria	2020	2021	2022	2023	2024	
		Baseline (2020) ^a	Average				Average	Maximum
HD-N-0001	Day (07:00-19:00)	48	48	45	48	43	48	49
	Evening (19:00-23:00)	48	48	47	50	45	47	47
	Night (23:00-07:00)	47	47	46	48	43	45	46
HD-N-0002	Day (07:00-19:00)	50	50	53	53	54	56	56
	Evening (19:00-23:00)	48	48	51	53	49	52	53
	Night (23:00-07:00)	48	48	52	52	49	52	53
HD-N-0003	Day (07:00-19:00)	61	61	61	62	59	61	61
	Evening (19:00-23:00)	55	55	56	59	55	55	56
	Night (23:00-07:00)	54	54	52	54	51	51	51
Notes: Noise monitoring are results compared to: The WHO [27] guideline recommends <70 dBA in a 24-hour period. a. 5 dBA difference from Baseline (2020) monitoring results [20].								

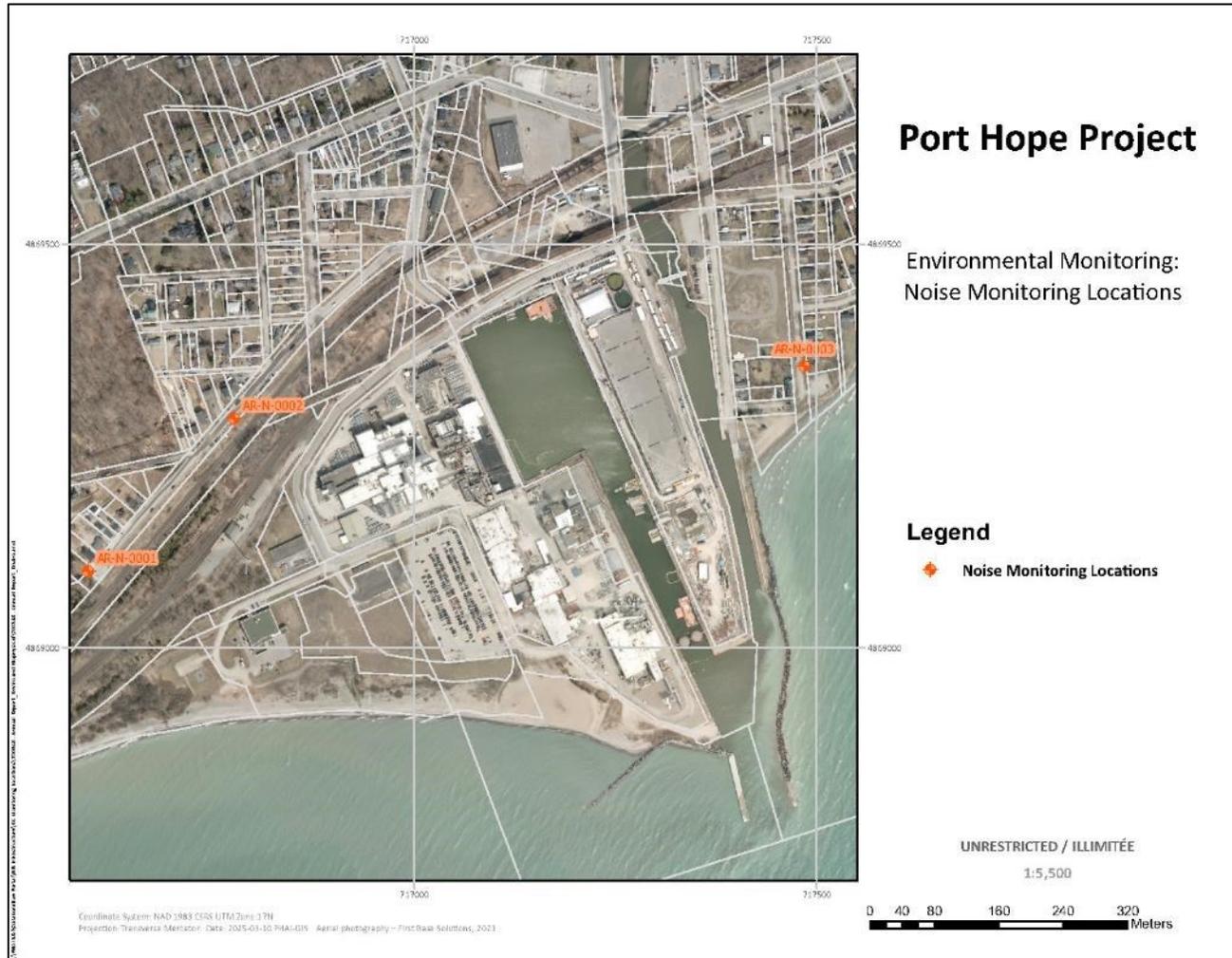


Figure 21: Port Hope Project Alexander Street Ravine Noise Monitoring Locations

Table 48: Alexander Street Ravine Noise Monitoring

Alexander Street Ravine				
		L_{eq} (dBA)		
Monitoring Location	Time of Measurement	Criteria	2024	
		Baseline (2023) ^a	Average	Maximum
AR-N-0001	Day (07:00-19:00)	59	59	60
	Evening (19:00-23:00)	60	59	60
	Night (23:00-07:00)	60	59	59
AR-N-0002	Day (07:00-19:00)	63	62	63
	Evening (19:00-23:00)	65	63	65
	Night (23:00-07:00)	64	62	63
AR-N-0003	Day (07:00-19:00)	60	59	60
	Evening (19:00-23:00)	58	55	56
	Night (23:00-07:00)	58	55	56

Notes:
Noise monitoring are results compared to:
The WHO [27] guideline recommends <70 dBA in a 24-hour period.
a. 13 dBA difference from Baseline (2023) monitoring results [20] (PHP Screening Report Table 12.1).

Table 49: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH1002A

PG-BH1002A									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.20	< 0.20	0.28	< 0.23	< 0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.04	0.04	0.05	0.05	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.93	1.10	1.08	0.78	1.23	2.0
Lead (dissolved)	µg/L	10	25	0.03	0.07	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.23	0.23	0.18	0.20	0.43	< 1.0
Uranium (dissolved)	µg/L	20	420	0.348	0.254	0.307	0.248	0.289	0.331
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	0.04
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	58.8	43.2	49.5	38.6	40.5	50.0
Beryllium (dissolved)	µg/L	-	67	0.007	< 0.007	< 0.007	0.012	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	6	7	6	7	6	12
Cadmium (dissolved)	µg/L	5	2.7	0.011	0.006	0.008	0.021	0.026	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.44	0.28	0.29	0.24	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	1.10	1.36	1.16	1.53	1.21	< 2.0
Silver (dissolved)	µg/L	-	1.5	0.05	< 0.05	< 0.05	< 0.05	< 0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.20	0.17	0.21	0.25	0.34	< 0.50

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Information Use

Zinc (dissolved)	µg/L	-	1,100	2.3	< 2.0	< 2.0	< 2.3	< 2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.67	7.63	7.60	7.68	7.71	7.81
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 50: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH1003A

		PG-BH1003A							
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	Well broken			< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900				3.38	1.70	2.4
Cobalt (dissolved)	µg/L	-	66				0.13	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87				< 0.20	0.98	< 1.0
Lead (dissolved)	µg/L	10	25				0.17	0.21	< 0.50
Nickel (dissolved)	µg/L	-	490				1.65	0.55	< 1.0
Uranium (dissolved)	µg/L	20	420				1.680	0.577	0.690
Radium-226	Bq/L	0.49	-				< 0.01	< 0.01	0.02
Thorium-230	Bq/L	0.65	-				< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-				< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000				92.2	76.8	79.0
Beryllium (dissolved)	µg/L	-	67				0.013	0.106	< 0.40
Boron (dissolved)	µg/L	5,000	45,000				17	14	15
Cadmium (dissolved)	µg/L	5	2.7				0.019	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29				< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200				10.74	2.93	3.30
Selenium (dissolved)	µg/L	10	63				0.29	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5				< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250				0.99	0.82	0.94

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Zinc (dissolved)	µg/L	-	1,100				< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-				8.05	8.12	8.20
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 51: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH1003B

PG-BH1003B									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.23	0.25	< 0.23	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.04	0.03	0.04	0.03	0.15	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.90	0.40	0.78	0.43	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.04	0.07	0.11	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.28	0.15	0.53	0.25	0.45	< 1.0
Uranium (dissolved)	µg/L	20	420	0.546	0.364	1.323	0.524	0.504	0.570
Radium-226	Bq/L	0.49	-	< 0.01	0.01	< 0.01	< 0.01	0.01	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	61.6	53.6	73.7	68.1	75.1	79.2
Beryllium (dissolved)	µg/L	-	67	< 0.008	< 0.007	0.009	0.013	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	7	10	12	8	9	14
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.006	0.006	0.017	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.34	0.24	0.41	0.35	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	0.99	1.38	0.84	1.26	1.11	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.47	0.21	0.31	0.32	0.37	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	2.5	< 2.0	2.5	4.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.78	7.69	7.71	7.65	7.75	7.88

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 52: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH1003C

PG-BH1003C									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.20	0.20	0.33	0.25	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.04	0.02	0.05	0.03	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.80	0.78	0.80	0.75	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.04	0.07	< 0.12	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.25	0.25	0.33	0.30	0.48	< 1.0
Uranium (dissolved)	µg/L	20	420	2.325	2.970	2.183	5.253	5.550	5.700
Radium-226	Bq/L	0.49	-	0.01	0.01	< 0.01	< 0.01	0.01	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	54.5	68.6	76.2	66.0	66.9	69.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.008	0.016	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	7	14	10	9	9	11
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.003	0.004	0.021	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.67	0.76	0.60	1.03	0.91	1.00
Selenium (dissolved)	µg/L	10	63	0.38	0.70	0.76	0.80	0.90	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.42	0.56	0.45	0.70	0.72	0.82

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.68	7.76	7.81	7.74	7.82	7.94
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 53: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH1003D

PG-BH1003D									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.28	0.20	0.28	0.23	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.29	0.03	0.03	0.03	0.15	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.45	0.88	0.73	0.55	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.38	0.07	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.78	0.38	0.30	0.23	0.45	< 1.0
Uranium (dissolved)	µg/L	20	420	1.538	0.640	0.689	0.710	0.682	0.700
Radium-226	Bq/L	0.49	-	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	69.9	60.7	67.9	64.7	68.8	70.0
Beryllium (dissolved)	µg/L	-	67	0.030	< 0.007	< 0.007	0.013	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	8	9	8	8	8	< 10
Cadmium (dissolved)	µg/L	5	2.7	0.018	0.005	0.004	0.020	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.45	0.24	0.24	0.35	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	0.72	0.87	0.66	0.93	0.96	< 2.0
Silver (dissolved)	µg/L	-	1.5	0.06	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.71	0.79	0.76	0.77	0.72	0.77

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Zinc (dissolved)	µg/L	-	1,100	5.0	3.8	< 3.8	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.68	7.67	7.71	7.77	7.73	7.89
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 54: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH204-22

PG-BH204-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.97	1.25	< 1.6
Cobalt (dissolved)	µg/L	-	66	0.03	0.16	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.27	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.20	0.40	< 1.0
Uranium (dissolved)	µg/L	20	420	0.663	0.358	0.650
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	173.3	159.3	170.0
Beryllium (dissolved)	µg/L	-	67	0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	9	7	< 10
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.08	2.48	6.80
Selenium (dissolved)	µg/L	10	63	0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.30	0.32	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.82	7.90	8.01
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 55: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH210-22

PG-BH210-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.81	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.77	1.55	2.2
Cobalt (dissolved)	µg/L	-	66	0.53	0.28	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.60	1.23	2.0
Lead (dissolved)	µg/L	10	25	1.29	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	1.37	0.93	1.4
Uranium (dissolved)	µg/L	20	420	1.176	0.470	0.513
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	126.7	125.8	140.0
Beryllium (dissolved)	µg/L	-	67	0.072	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	15	13	16
Cadmium (dissolved)	µg/L	5	2.7	0.013	0.029	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.40	1.73	3.20
Selenium (dissolved)	µg/L	10	63	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.62	0.49	0.64

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Zinc (dissolved)	µg/L	-	1,100	7.0	4.5	9.0
Additional Parameters						
pH	-	-	-	8.00	8.02	8.24

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 56: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH214-22

PG-BH214-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	299.8	110.8	337.0
Cobalt (dissolved)	µg/L	-	66	0.25	0.36	0.51
Copper (dissolved)	µg/L	1,000	87	0.73	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.36	0.20	0.51
Nickel (dissolved)	µg/L	-	490	2.13	2.33	2.9
Uranium (dissolved)	µg/L	20	420	3.923	1.406	2.720
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	44.8	40.7	44.5
Beryllium (dissolved)	µg/L	-	67	< 0.019	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	9	9	11
Cadmium (dissolved)	µg/L	5	2.7	< 0.005	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	< 0.48	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	< 0.07	0.54	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.65	0.43	0.94

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Zinc (dissolved)	µg/L	-	1,100	< 3.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.62	7.62	7.81

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 57: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-BH404-22

PG-BH404-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.45	1.05	2.8
Cobalt (dissolved)	µg/L	-	66	0.99	0.77	1.01
Copper (dissolved)	µg/L	1,000	87	1.68	1.73	3.0
Lead (dissolved)	µg/L	10	25	0.18	0.30	0.52
Nickel (dissolved)	µg/L	-	490	2.08	1.58	2.0
Uranium (dissolved)	µg/L	20	420	176.50	87.83	103.0
Radium-226	Bq/L	0.49	-	0.15	0.12	0.14
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	78.1	62.9	75.6
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.112	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	37	32	35
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.027	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	4.93	5.23	5.60
Selenium (dissolved)	µg/L	10	63	0.23	0.66	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.47	0.70	1.77

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	3.0	< 5.0
Additional Parameters						
pH	-	-	-	7.26	7.34	7.52
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 58: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-01A

PG-MW03-01A									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average			Average	Maximum	
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	No sample	No sample	1.05	1.15	1.90
Arsenic (dissolved)	µg/L	25	1,900	1.30			1.20	1.13	1.3
Cobalt (dissolved)	µg/L	-	66	0.13			0.22	0.25	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.35			0.50	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.08			0.22	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.55			0.70	0.65	< 1.0
Uranium (dissolved)	µg/L	20	420	0.205			0.274	0.341	0.510
Radium-226	Bq/L	0.49	-	< 0.01			< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02			< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02			< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	135.0			125.5	137.5	150.0
Beryllium (dissolved)	µg/L	-	67	< 0.007			< 0.012	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	22			15	16	17
Cadmium (dissolved)	µg/L	5	2.7	< 0.003			0.005	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01			< 0.01	0.04	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.54			1.16	1.30	1.50
Selenium (dissolved)	µg/L	10	63	< 0.04			< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05			< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.94			0.91	0.73	1.10

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Zinc (dissolved)	µg/L	-	1,100	2.0			3.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.95			7.93	7.93	8.14
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 59: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-01B

PG-MW03-01B									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.87	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.23	1.18	1.00	2.25	2.08	2.2
Cobalt (dissolved)	µg/L	-	66	0.06	0.17	0.17	0.14	0.30	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.68	4.80	< 0.20	0.85	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.03	0.11	< 0.09	0.18	0.32	0.58
Nickel (dissolved)	µg/L	-	490	0.28	1.60	0.45	0.60	0.78	< 1.0
Uranium (dissolved)	µg/L	20	420	0.285	0.323	0.480	0.669	1.067	1.440
Radium-226	Bq/L	0.49	-	0.01	0.02	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	67.0	54.0	57.4	68.5	60.1	70.4
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.009	< 0.007	0.109	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	12	14	25	115	129	151
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.007	0.012	< 0.003	0.026	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.02	< 0.01	< 0.01	0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.89	1.19	1.11	3.19	4.48	8.50
Selenium (dissolved)	µg/L	10	63	< 0.04	0.09	0.04	0.06	0.55	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.40	0.23	0.50	1.02	1.08	1.67

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Zinc (dissolved)	µg/L	-	1,100	2.3	4.3	< 3.5	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.83	7.79	7.86	7.98	8.06	8.31
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 60: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-01C

PG-MW03-01C									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.23	0.58	0.43	0.23	0.50	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.03	0.03	0.03	0.04	0.16	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.55	0.58	0.65	0.53	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.07	< 0.09	< 0.09	0.21	< 0.50
Nickel (dissolved)	µg/L	-	490	0.18	0.25	0.30	0.23	0.50	< 1.0
Uranium (dissolved)	µg/L	20	420	0.499	0.504	0.451	0.527	0.536	0.550
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	39.8	43.9	42.2	45.1	47.2	49.0
Beryllium (dissolved)	µg/L	-	67	0.009	< 0.007	0.008	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	20	19	24	25	25	27
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.004	0.005	0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.13	0.07	0.04	0.11	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	0.59	0.44	0.58	0.59	0.81	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.65	0.64	0.57	0.65	0.63	0.65

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	3.5	2.5	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.54	7.56	7.58	7.55	7.51	7.93
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 61: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-02A

PG-MW03-02A									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	No sample	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.90		1.70	1.70	2.03	2.8
Cobalt (dissolved)	µg/L	-	66	0.04		0.09	0.16	0.23	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.40		2.30	0.53	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.01		< 0.09	0.18	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.40		0.30	0.75	0.53	< 1.0
Uranium (dissolved)	µg/L	20	420	0.59 1		0.18 8	0.28 0	0.173	0.285
Radium-226	Bq/L	0.49	-	0.13		0.02	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.04		< 0.03	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.04		< 0.03	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	62.4		67.5	84.9	81.5	86.5
Beryllium (dissolved)	µg/L	-	67	< 0.00 7		< 0.00 7	0.00 9	0.110	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	15		58	17	14	16
Cadmium (dissolved)	µg/L	5	2.7	0.00 3		0.00 4	0.00 5	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	--		< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.03		1.01	0.99	1.25	1.70
Selenium (dissolved)	µg/L	10	63	< 0.04		0.06	< 0.04	0.54	< 2.0

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Silver (dissolved)	µg/L	-	1.5	< 0.05		< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.14		0.87	0.87	0.42	< 0.50
Zinc (dissolved)	µg/L	-	1,100	< 2.0		< 2.0	4.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	--		7.88	8.07	7.95	8.17
Notes: 2024 averages are based on quarterly (4) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit; -- .									

Table 62: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-02B

		PG-MW03-02B							
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90				Well damaged	
Arsenic (dissolved)	µg/L	25	1,900	0.47					
Cobalt (dissolved)	µg/L	-	66	0.02					
Copper (dissolved)	µg/L	1,000	87	< 0.20					
Lead (dissolved)	µg/L	10	25	0.03					
Nickel (dissolved)	µg/L	-	490	0.13					
Uranium (dissolved)	µg/L	20	420	0.053					
Radium-226	Bq/L	0.49	-	< 0.01					
Thorium-230	Bq/L	0.65	-	< 0.02					
Thorium-232	Bq/L	0.60	-	< 0.02					
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	233.3					
Beryllium (dissolved)	µg/L	-	67	< 0.007					
Boron (dissolved)	µg/L	5,000	45,000	11					
Cadmium (dissolved)	µg/L	5	2.7	< 0.003					
Mercury (dissolved)	µg/L	1	0.29	0.01					
Molybdenum (dissolved)	µg/L	-	9,200	0.83					
Selenium (dissolved)	µg/L	10	63	< 0.04					
Silver (dissolved)	µg/L	-	1.5	< 0.05					
Vanadium (dissolved)	µg/L	-	250	0.12					
Zinc (dissolved)	µg/L	-	1,100	< 2.0					
Additional Parameters									

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pH	-	-	-	7.91					
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 63: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-02C

PG-MW03-02C									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	No sample	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.28		0.20	0.33	0.65	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.04		0.06	0.05	0.20	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.25		0.20	0.33	1.23	2.0
Lead (dissolved)	µg/L	10	25	0.02		< 0.09	0.12	0.20	< 0.50
Nickel (dissolved)	µg/L	-	490	0.23		0.20	0.18	0.50	< 1.0
Uranium (dissolved)	µg/L	20	420	2.375		1.252	1.398	1.480	1.590
Radium-226	Bq/L	0.49	-	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02		< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02		< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	69.8		59.6	66.4	73.0	78.4
Beryllium (dissolved)	µg/L	-	67	< 0.007		< 0.007	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	11		22	9	13	19
Cadmium (dissolved)	µg/L	5	2.7	0.003		< 0.003	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.04		0.03	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.93		0.98	0.91	1.17	1.80
Selenium (dissolved)	µg/L	10	63	< 0.04		< 0.04	0.05	0.55	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05		< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.17		0.11	0.15	0.36	< 0.50
Zinc (dissolved)	µg/L	-	1,100	< 2.0		< 2.0	< 2.0	2.8	< 5.0

Additional Parameters									
pH	-	-	-	7.80		7.68	7.96	7.85	8.04
<p>Notes: 2024 averages are based on quarterly (4) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit; - – .</p>									

Table 64: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-03B

PG-MW03-03B									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	< 0.20	0.53	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.02	0.02	0.02	0.01	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	< 0.20	< 0.20	< 0.20	0.23	1.03	1.1
Lead (dissolved)	µg/L	10	25	0.05	< 0.01	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	< 0.10	< 0.10	0.10	0.33	< 1.0
Uranium (dissolved)	µg/L	20	420	0.052	0.031	0.094	0.028	0.046	< 0.100
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	197.0	175.0	185.0	170.0	173.8	193.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	8	8	9	9	8	< 10
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.003	< 0.003	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.14	1.06	1.06	1.21	1.28	2.00
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	0.06	< 0.04	0.56	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.18	0.07	1.49	0.06	0.20	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.3	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.90	7.92	7.78	7.81	7.82	8.10

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 65: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW03-03C

PG-MW03-03C									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	0.20	0.45	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.08	0.05	0.06	0.04	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.40	0.23	< 0.20	0.28	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.04	0.07	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	0.10	0.13	0.10	0.40	< 1.0
Uranium (dissolved)	µg/L	20	420	9.980	9.985	9.117	9.613	8.930	9.590
Radium-226	Bq/L	0.49	-	< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	61.2	55.8	53.0	53.7	55.9	58.3
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	10	12	11	12	14	22
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.003	0.003	< 0.003	0.026	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.37	1.60	1.38	1.40	1.55	1.80
Selenium (dissolved)	µg/L	10	63	0.40	1.00	0.67	0.48	0.74	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.39	0.41	0.43	0.47	0.53	0.56

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.87	7.87	7.90	7.95	7.91	8.10
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 66: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW1A-02

PG-MW1A-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	No sample	2.10	3.20	10.0
Arsenic (dissolved)	µg/L	25	1,900	1.20	1.40		1.50	1.73	2.0
Cobalt (dissolved)	µg/L	-	66	0.06	0.11		0.07	0.21	< 0.50
Copper (dissolved)	µg/L	1,000	87	< 0.20	1.20		0.30	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.31		< 0.09	0.37	1.20
Nickel (dissolved)	µg/L	-	490	0.20	0.30		0.50	0.58	< 1.0
Uranium (dissolved)	µg/L	20	420	0.931	0.967		1.110	2.057	4.990
Radium-226	Bq/L	0.49	-	< 0.01	0.01		< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02		< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02		< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	77.6	41.3		72.8	85.9	113.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.022		< 0.007	0.106	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	260	215		229	248	260
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003		0.003	0.026	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01		0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	11.80	10.76		8.98	10.68	13.90
Selenium (dissolved)	µg/L	10	63	0.04	< 0.04		0.05	0.62	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05		< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.45	0.27		1.02	2.42	5.66

Zinc (dissolved)	µg/L	-	1,100	< 2.0	3.0		< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	8.21	8.27		8.14	8.04	8.13
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit; - – .</p>									

Table 67: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW1B-02

PG-MW1B-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.43	0.53	0.35	0.33	0.45	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.09	0.37	0.05	0.08	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.30	0.80	0.28	0.30	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.08	0.69	< 0.09	0.10	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.25	0.80	0.28	0.28	0.43	< 1.0
Uranium (dissolved)	µg/L	20	420	0.153	0.314	0.096	0.135	0.146	0.190
Radium-226	Bq/L	0.49	-	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	63.2	79.9	62.3	69.4	70.2	77.8
Beryllium (dissolved)	µg/L	-	67	0.013	0.046	< 0.007	0.014	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	257	244	260	264	251	274
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.010	0.004	0.018	0.026	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	12.04	11.87	10.66	10.83	11.65	12.60
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	< 0.04	0.31	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.48	1.36	0.36	0.56	0.51	0.75

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	4.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	8.24	7.94	8.12	8.20	8.11	8.22
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 68: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW1C-02

PG-MW1C-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.28	0.30	0.25	0.23	0.43	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.06	0.06	0.03	0.04	0.15	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.53	< 0.20	< 0.20	< 0.20	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.07	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.20	0.18	0.13	0.13	0.38	< 1.0
Uranium (dissolved)	µg/L	20	420	0.199	0.149	0.159	0.171	0.147	0.208
Radium-226	Bq/L	0.49	-	0.01	0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	222.8	222.3	221.8	229.3	190.0	220.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	11	11	12	11	9	11
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.58	0.74	0.60	0.62	0.60	0.71
Selenium (dissolved)	µg/L	10	63	0.05	< 0.04	< 0.04	0.05	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.08	0.11	0.04	0.03	0.17	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.89	7.86	7.68	7.80	7.81	7.98
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 69: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW1D-02

PG-MW1D-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	0.23	< 0.20	< 0.2
Cobalt (dissolved)	µg/L	-	66	0.03	0.07	0.03	0.04	0.09	0.19
Copper (dissolved)	µg/L	1,000	87	0.97	0.65	0.63	0.63	1.33	2.0
Lead (dissolved)	µg/L	10	25	< 0.01	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.17	0.28	0.23	0.20	0.30	0.5
Uranium (dissolved)	µg/L	20	420	0.829	0.859	0.931	0.859	0.714	0.875
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	41.6	47.1	45.8	37.8	32.8	37.2
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.008	< 0.007	0.012	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	7	7	6	9	5	6
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.004	0.004	0.022	0.005	0.008
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.20	0.19	0.17	0.31	0.47	0.60
Selenium (dissolved)	µg/L	10	63	0.13	0.22	0.11	0.63	0.23	0.5
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.20	0.28	0.22	0.23	0.29	0.46

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	2.0	2.3	< 3.0
Additional Parameters									
pH	-	-	-	7.71	7.45	7.44	7.71	7.43	7.62

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit.

Table 70: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW2B-02

PG-MW2B-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	0.43	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.10	0.15	0.14	0.12	0.21	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.88	< 0.20	< 0.20	< 0.20	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.01	0.07	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	< 0.10	< 0.10	< 0.10	0.35	< 1.0
Uranium (dissolved)	µg/L	20	420	0.013	0.005	0.004	0.005	0.027	< 0.100
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	119.0	127.0	129.5	120.8	119.3	123.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	35	39	36	39	35	39
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.70	0.94	0.76	0.82	0.71	0.74
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	< 0.04	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	< 0.01	0.05	0.01	0.02	0.14	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	2.8	< 2.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	8.08	8.09	8.07	8.08	8.12	8.23
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 71: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW2C-02

		PG-MW2C-02							
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	No sample				
Arsenic (dissolved)	µg/L	25	1,900	< 0.20					
Cobalt (dissolved)	µg/L	-	66	0.03					
Copper (dissolved)	µg/L	1,000	87	0.83					
Lead (dissolved)	µg/L	10	25	0.02					
Nickel (dissolved)	µg/L	-	490	0.30					
Uranium (dissolved)	µg/L	20	420	0.435					
Radium-226	Bq/L	0.49	-	< 0.01					
Thorium-230	Bq/L	0.65	-	< 0.02					
Thorium-232	Bq/L	0.60	-	< 0.02					
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	23.3					
Beryllium (dissolved)	µg/L	-	67	< 0.007					
Boron (dissolved)	µg/L	5,000	45,000	11					
Cadmium (dissolved)	µg/L	5	2.7	< 0.003					
Mercury (dissolved)	µg/L	1	0.29	0.01					
Molybdenum (dissolved)	µg/L	-	9,200	0.20					
Selenium (dissolved)	µg/L	10	63	0.15					
Silver (dissolved)	µg/L	-	1.5	0.05					
Vanadium (dissolved)	µg/L	-	250	0.21					
Zinc (dissolved)	µg/L	-	1,100	4.7					
Additional Parameters									

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pH	-	-	-	7.49					
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 72: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW3A-02

PG-MW3A-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average			Average	Maximum	
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	Well damaged		1.50	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900			0.60	< 0.30	0.43	< 1.0
Cobalt (dissolved)	µg/L	-	66			0.04	0.02	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87			0.80	0.73	0.98	< 1.0
Lead (dissolved)	µg/L	10	25			< 0.09	0.07	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490			0.20	0.35	0.40	< 1.0
Uranium (dissolved)	µg/L	20	420			0.042	0.061	0.051	< 0.100
Radium-226	Bq/L	0.49	-			0.03	0.11	0.09	0.12
Thorium-230	Bq/L	0.65	-			< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-			< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000			4,160	2,980	2,593	2,870
Beryllium (dissolved)	µg/L	-	67			< 0.007	0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000			658	659	605	640
Cadmium (dissolved)	µg/L	5	2.7			0.006	0.005	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29			< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200			0.66	0.46	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63			0.08	0.06	0.54	< 2.0
Silver (dissolved)	µg/L	-	1.5			< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250			0.57	0.14	0.47	0.63

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Zinc (dissolved)	µg/L	-	1,100			4.0	5.8	3.8	< 5.0
Additional Parameters									
pH	-	-	-			7.35	7.53	7.48	7.52

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 73: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW3B-02

PG-MW3B-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	2.13	2.25	2.40	2.23	2.13	2.4
Cobalt (dissolved)	µg/L	-	66	0.01	0.01	0.04	0.01	0.13	< 0.50
Copper (dissolved)	µg/L	1,000	87	< 0.20	0.23	0.25	< 0.20	< 0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.07	0.16	0.10	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	< 0.10	0.13	< 0.10	0.33	< 1.0
Uranium (dissolved)	µg/L	20	420	0.110	0.082	0.234	0.079	0.076	< 0.100
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	54.3	52.3	55.4	53.8	54.3	60.3
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.011	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	63	57	63	70	65	70
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.003	0.003	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	0.02	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.41	1.47	1.41	1.43	1.40	1.50
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	< 0.04	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.06	0.09	0.14	0.06	0.18	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.3	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	8.31	8.19	8.28	8.20	8.25	8.29

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 74: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW3C-02

PG-MW3C-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.25	0.25	0.28	0.55	0.48	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.02	0.03	0.04	0.22	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.43	0.40	0.30	0.70	1.48	2.0
Lead (dissolved)	µg/L	10	25	0.02	0.10	< 0.09	0.98	0.30	0.51
Nickel (dissolved)	µg/L	-	490	0.15	0.10	0.18	0.43	0.45	< 1.0
Uranium (dissolved)	µg/L	20	420	0.936	0.792	1.113	1.480	1.034	1.130
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.03
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	84.7	85.7	76.8	67.1	74.6	83.5
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	0.054	0.111	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	12	11	13	20	11	13
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	0.012	0.026	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.32	0.42	0.38	0.63	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	0.32	0.34	0.30	0.32	0.76	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.77	0.91	0.76	1.28	0.86	1.10

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Zinc (dissolved)	µg/L	-	1,100	2.5	5.5	< 2.0	3.3	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.66	7.59	7.60	7.70	7.60	7.77
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 75: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW3D-02

PG-MW3D-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.25	< 0.20	0.20	0.25	0.3
Cobalt (dissolved)	µg/L	-	66	0.03	0.17	0.01	0.04	0.07	0.10
Copper (dissolved)	µg/L	1,000	87	1.45	0.70	0.40	0.57	1.00	1.0
Lead (dissolved)	µg/L	10	25	0.02	< 0.09	< 0.09	0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.25	1.25	< 0.10	0.17	0.25	0.3
Uranium (dissolved)	µg/L	20	420	0.203	0.213	0.209	0.238	0.207	0.218
Radium-226	Bq/L	0.49	-	0.02	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	0.02	0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	23.3	45.8	30.9	32.6	36.0	38.5
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	17	33	13	17	17	18
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.007	0.005	0.004	0.004	0.005
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.18	0.22	0.10	0.16	< 0.40	< 0.40
Selenium (dissolved)	µg/L	10	63	0.15	0.27	0.24	0.27	0.22	0.3
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.35	0.49	0.41	0.46	0.59	0.71

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Zinc (dissolved)	µg/L	-	1,100	3.0	2.5	2.0	3.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.61	7.34	7.38	7.53	7.36	7.36
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 76: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW4A-02

PG-MW4A-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.45	< 0.20	< 0.20	0.43	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.03	0.02	0.02	0.01	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.13	< 0.20	< 0.20	< 0.20	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.08	< 0.09	0.12	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	0.10	< 0.10	0.30	0.35	< 1.0
Uranium (dissolved)	µg/L	20	420	0.013	0.025	0.004	0.033	0.052	< 0.100
Radium-226	Bq/L	0.49	-	0.02	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	87.2	103.0	99.9	88.8	88.6	93.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	0.009	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	163	182	174	171	165	180
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	0.003	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.04	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	2.60	2.75	2.37	2.19	2.70	3.60
Selenium (dissolved)	µg/L	10	63	< 0.04	0.29	0.06	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.05	0.19	0.03	0.03	0.19	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	2.5	< 2.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	8.30	8.06	8.28	8.31	8.26	8.35
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 77: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW4B-02

PG-MW4B-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	2.15	2.25	2.23	2.17	2.10	2.2
Cobalt (dissolved)	µg/L	-	66	0.12	0.02	0.03	0.02	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.35	< 0.20	0.27	0.37	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.18	0.07	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.23	< 0.10	< 0.10	< 0.10	0.33	< 1.0
Uranium (dissolved)	µg/L	20	420	0.295	0.166	0.244	0.192	0.198	0.261
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	65.9	75.2	77.6	65.9	64.4	72.4
Beryllium (dissolved)	µg/L	-	67	0.014	< 0.007	0.008	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	30	32	35	31	27	29
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.004	0.003	0.004	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.02	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.91	1.01	0.96	0.89	1.00	1.20
Selenium (dissolved)	µg/L	10	63	< 0.04	0.29	0.07	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.33	0.04	0.12	0.08	0.17	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	2.5	< 2.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	8.16	8.04	8.12	8.08	8.14	8.19
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 78: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW4C-02

PG-MW4C-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.90	2.15	2.03	2.00	2.05	2.1
Cobalt (dissolved)	µg/L	-	66	0.58	0.67	0.29	0.28	0.31	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.53	0.25	0.33	< 0.20	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.11	< 0.09	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.10	0.18	< 0.10	< 0.10	0.33	< 1.0
Uranium (dissolved)	µg/L	20	420	0.175	0.143	0.143	0.102	0.098	0.106
Radium-226	Bq/L	0.49	-	0.01	0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	160.0	177.3	169.7	155.0	156.5	160.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.008	< 0.007	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	11	12	24	9	9	11
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.005	0.004	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.01	< 0.01	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.73	0.72	0.65	0.59	0.68	0.80
Selenium (dissolved)	µg/L	10	63	< 0.04	0.32	0.06	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.10	0.19	0.06	0.01	0.15	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	4.0	< 2.0	< 2.0	< 2.0	2.8	< 5.0
Additional Parameters									
pH	-	-	-	7.90	7.86	7.85	7.75	7.96	8.09
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 79: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW5A-22

PG-MW5A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	2.48	5.10
Arsenic (dissolved)	µg/L	25	1,900	2.10	1.75	2.8
Cobalt (dissolved)	µg/L	-	66	0.41	0.26	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.13	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	1.12	0.27	< 0.50
Nickel (dissolved)	µg/L	-	490	1.33	0.83	1.3
Uranium (dissolved)	µg/L	20	420	0.399	0.290	0.611
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	151.0	158.0	188.0
Beryllium (dissolved)	µg/L	-	67	0.041	0.109	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	157	154	167
Cadmium (dissolved)	µg/L	5	2.7	0.009	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.97	0.88	1.20
Selenium (dissolved)	µg/L	10	63	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.44	0.77	1.40

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Zinc (dissolved)	µg/L	-	1,100	4.7	2.8	< 5.0
Additional Parameters						
pH	-	-	-	8.07	8.02	8.10

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 80: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW5B-22

PG-MW5B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	1.39	2.10
Arsenic (dissolved)	µg/L	25	1,900	2.00	2.13	2.4
Cobalt (dissolved)	µg/L	-	66	0.05	0.34	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.40	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.37	1.15	1.5
Uranium (dissolved)	µg/L	20	420	0.800	1.705	2.280
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	267.3	318.5	441.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	10	10	11
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.03	1.15	1.20
Selenium (dissolved)	µg/L	10	63	< 0.04	0.55	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.32	1.31	2.68

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Zinc (dissolved)	µg/L	-	1,100	2.7	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.89	7.80	8.15

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 81: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW5C-22

PG-MW5C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.27	0.43	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.03	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.73	1.23	< 2.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.13	0.38	< 1.0
Uranium (dissolved)	µg/L	20	420	0.269	0.211	0.230
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	18.1	17.7	20.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	13	12	13
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.01	0.55	< 0.70
Selenium (dissolved)	µg/L	10	63	0.48	0.78	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.65	0.76	0.92

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Zinc (dissolved)	µg/L	-	1,100	2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.64	7.67	7.93

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 82: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW6A-22

PG-MW6A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	3.43	0.48	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.04	0.15	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.20	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.27	0.45	< 1.0
Uranium (dissolved)	µg/L	20	420	0.857	0.872	2.380
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	80.0	75.3	88.6
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	6	7	< 10
Cadmium (dissolved)	µg/L	5	2.7	0.008	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.90	0.88	1.20
Selenium (dissolved)	µg/L	10	63	0.05	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.72	0.64	1.00

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Zinc (dissolved)	µg/L	-	1,100	2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.72	7.81	7.95

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 83: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW6C-22

PG-MW6C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	2.13	1.75	2.5
Cobalt (dissolved)	µg/L	-	66	0.31	0.35	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.13	1.35	2.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.22	< 0.50
Nickel (dissolved)	µg/L	-	490	0.87	0.95	< 1.0
Uranium (dissolved)	µg/L	20	420	231.3	194.3	222.0
Radium-226	Bq/L	0.49	-	0.02	< 0.01	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	147.0	95.0	107.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	66	55	65
Cadmium (dissolved)	µg/L	5	2.7	0.008	0.027	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.02	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	14.33	10.75	12.00
Selenium (dissolved)	µg/L	10	63	0.07	0.55	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.50	0.50	0.58

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.19	7.39	7.74
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 84: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW7B-22

PG-MW7B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1134.3	827.8	1190.0
Cobalt (dissolved)	µg/L	-	66	1.93	1.82	1.95
Copper (dissolved)	µg/L	1,000	87	1.75	1.93	3.0
Lead (dissolved)	µg/L	10	25	0.29	0.20	< 0.50
Nickel (dissolved)	µg/L	-	490	16.05	10.40	13.4
Uranium (dissolved)	µg/L	20	420	128.8	96.4	137.0
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	16.3	11.6	12.7
Beryllium (dissolved)	µg/L	-	67	0.023	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	16	9	< 10
Cadmium (dissolved)	µg/L	5	2.7	2.60	2.62	3.95
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	6735	6043	6610
Selenium (dissolved)	µg/L	10	63	4.44	5.54	6.7
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.17	0.24	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	7.5	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.47	7.47	7.47
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 85: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW8A-22

PG-MW8A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.81	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.83	1.33	1.7
Cobalt (dissolved)	µg/L	-	66	0.11	0.20	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.57	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.20	< 0.50
Nickel (dissolved)	µg/L	-	490	0.60	0.63	< 1.0
Uranium (dissolved)	µg/L	20	420	5.913	6.100	6.700
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	64.8	62.2	73.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	12	12	13
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	4.03	4.58	4.70
Selenium (dissolved)	µg/L	10	63	0.18	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.35	0.31	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.89	7.87	7.96
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 86: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW8B-22

PG-MW8B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	No sample	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900		1,630	1,660
Cobalt (dissolved)	µg/L	-	66		1.31	1.31
Copper (dissolved)	µg/L	1,000	87		2.50	3.0
Lead (dissolved)	µg/L	10	25		< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490		36.60	36.8
Uranium (dissolved)	µg/L	20	420		11.150	11.300
Radium-226	Bq/L	0.49	-		< 0.01	0.01
Thorium-230	Bq/L	0.65	-		< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-		< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000		14.9	15.0
Beryllium (dissolved)	µg/L	-	67		< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000		9	9
Cadmium (dissolved)	µg/L	5	2.7		0.399	0.427
Mercury (dissolved)	µg/L	1	0.29		< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200		691.00	696.00
Selenium (dissolved)	µg/L	10	63		0.43	0.5
Silver (dissolved)	µg/L	-	1.5		< 0.05	< 0.05

Vanadium (dissolved)	µg/L	-	250		0.28	0.28
Zinc (dissolved)	µg/L	-	1,100		2.5	3.0
Additional Parameters						
pH	-	-	-		7.69	7.88
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 87: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW8C-22

PG-MW8C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	No sample	< 0.50	< 0.50
Arsenic (dissolved)	µg/L	25	1,900		740.0	740.0
Cobalt (dissolved)	µg/L	-	66		1.30	1.30
Copper (dissolved)	µg/L	1,000	87		1.10	1.1
Lead (dissolved)	µg/L	10	25		< 0.50	< 0.50
Nickel (dissolved)	µg/L	-	490		37.00	37.0
Uranium (dissolved)	µg/L	20	420		10.000	10.000
Radium-226	Bq/L	0.49	-		< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-		< 0.01	< 0.01
Thorium-232	Bq/L	0.60	-		< 0.01	< 0.01
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000		16.0	16.0
Beryllium (dissolved)	µg/L	-	67		< 0.400	< 0.40
Boron (dissolved)	µg/L	5,000	45,000		< 10	< 10
Cadmium (dissolved)	µg/L	5	2.7		< 0.090	< 0.090
Mercury (dissolved)	µg/L	1	0.29		< 0.10	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200		700.00	700.00
Selenium (dissolved)	µg/L	10	63		< 2.00	< 2.0
Silver (dissolved)	µg/L	-	1.5		< 0.09	< 0.09

Vanadium (dissolved)	µg/L	-	250		< 0.50	< 0.50
Zinc (dissolved)	µg/L	-	1,100		< 5.0	< 5.0
Additional Parameters						
pH	-	-	-		-	-
<p>Notes: 2024 averages are based on quarterly (4) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;</p>						

Table 88: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW9A-22

PG-MW9A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	34.6	14.3	54.0
Cobalt (dissolved)	µg/L	-	66	0.15	0.20	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.43	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.10	8.32	33.0
Nickel (dissolved)	µg/L	-	490	0.98	0.88	1.1
Uranium (dissolved)	µg/L	20	420	5.705	3.595	4.920
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	64.8	55.3	61.4
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	16	13	14
Cadmium (dissolved)	µg/L	5	2.7	0.007	0.030	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.04	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	17.03	16.03	19.00
Selenium (dissolved)	µg/L	10	63	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.26	0.33	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	2.3	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.76	7.84	8.04
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 89: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW10A-22

PG-MW10A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	3.65	2.88	3.40
Arsenic (dissolved)	µg/L	25	1,900	281.5	228.0	240.0
Cobalt (dissolved)	µg/L	-	66	0.38	0.34	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.10	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	2.85	1.38	1.5
Uranium (dissolved)	µg/L	20	420	71.73	43.88	51.90
Radium-226	Bq/L	0.49	-	0.02	0.01	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	96.1	74.8	100.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	33	33	53
Cadmium (dissolved)	µg/L	5	2.7	0.013	0.027	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	33.78	8.70	11.70
Selenium (dissolved)	µg/L	10	63	0.64	0.70	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	8.99	8.41	10.10

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Zinc (dissolved)	µg/L	-	1,100	2.3	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.75	7.92	8.11
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 90: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW11A-22

PG-MW11A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.15	0.75	1.3
Cobalt (dissolved)	µg/L	-	66	0.04	0.16	< 0.50
Copper (dissolved)	µg/L	1,000	87	2.30	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.53	0.80	1.5
Uranium (dissolved)	µg/L	20	420	0.457	0.401	0.580
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	34.1	43.2	51.1
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	11	12	16
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	2.79	2.15	2.70
Selenium (dissolved)	µg/L	10	63	0.08	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.05	0.17	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	3.3	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.77	7.86	8.01
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 91: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW11B-22

PG-MW11B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.97	0.90	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.05	0.43	1.04
Copper (dissolved)	µg/L	1,000	87	1.17	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.37	0.88	1.4
Uranium (dissolved)	µg/L	20	420	2.050	2.100	2.310
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	0.03	0.06
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.04
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	98.3	81.9	87.3
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	53	51	53
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	6.94	4.30	5.90
Selenium (dissolved)	µg/L	10	63	0.11	0.63	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	2.02	1.54	2.14

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	--	8.09	8.17
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 92: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW11C-22

PG-MW11C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.43	0.37	0.5
Cobalt (dissolved)	µg/L	-	66	0.04	0.10	0.16
Copper (dissolved)	µg/L	1,000	87	0.53	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.37	0.43	0.5
Uranium (dissolved)	µg/L	20	420	2.023	2.387	2.550
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	55.6	57.2	62.6
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	17	21	25
Cadmium (dissolved)	µg/L	5	2.7	0.009	0.008	0.010
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	25.03	27.60	31.90
Selenium (dissolved)	µg/L	10	63	0.71	0.28	0.4
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.95	0.81	0.91

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Zinc (dissolved)	µg/L	-	1,100	3.0	< 2.0	< 2.0
Additional Parameters						
pH	-	-	-	7.80	7.84	7.90
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 93: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW12A-22

PG-MW12A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.95	0.78	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.03	0.15	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.63	1.23	< 2.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.50	0.60	< 1.0
Uranium (dissolved)	µg/L	20	420	0.407	0.237	0.308
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	69.2	66.7	68.7
Beryllium (dissolved)	µg/L	-	67	0.010	0.170	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	40	36	39
Cadmium (dissolved)	µg/L	5	2.7	0.016	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	2.15	1.65	2.00
Selenium (dissolved)	µg/L	10	63	0.19	0.54	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.55	0.82	1.00

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	8.23	8.26	8.30
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 94: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW12B-22

PG-MW12B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.53	0.55	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.14	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.73	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.29	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.43	0.40	< 1.0
Uranium (dissolved)	µg/L	20	420	0.111	0.140	0.229
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	47.7	52.3	55.4
Beryllium (dissolved)	µg/L	-	67	0.015	0.255	0.61
Boron (dissolved)	µg/L	5,000	45,000	61	42	46
Cadmium (dissolved)	µg/L	5	2.7	0.012	0.027	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	21.33	12.05	17.60
Selenium (dissolved)	µg/L	10	63	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.51	0.40	0.51

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Zinc (dissolved)	µg/L	-	1,100	3.7	2.8	< 5.0
Additional Parameters						
pH	-	-	-	8.16	8.01	8.16
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 95: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW12C-22

PG-MW12C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.00	0.93	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.16	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.40	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.43	0.48	< 1.0
Uranium (dissolved)	µg/L	20	420	0.512	0.463	0.500
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	99.9	97.4	108.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	14	11	13
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.66	1.35	2.20
Selenium (dissolved)	µg/L	10	63	< 0.04	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.65	0.70	0.83

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.78	7.87	8.00
<p>Notes: 2024 averages are based on quarterly (4) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;</p>						

Table 96: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW13A-22

PG-MW13A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	3.25	3.03	3.2
Cobalt (dissolved)	µg/L	-	66	0.02	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	< 0.20	0.98	1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.28	0.85
Nickel (dissolved)	µg/L	-	490	0.28	0.35	< 1.0
Uranium (dissolved)	µg/L	20	420	0.130	0.137	0.300
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	152.0	159.3	170.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.104	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	10	10	11
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.98	1.22	2.40
Selenium (dissolved)	µg/L	10	63	0.05	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.07	0.29	0.85

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.90	7.89	7.92
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 97: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW13B-22

PG-MW13B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.20	< 0.20	0.2
Cobalt (dissolved)	µg/L	-	66	0.02	0.48	0.87
Copper (dissolved)	µg/L	1,000	87	0.33	< 1.50	2.0
Lead (dissolved)	µg/L	10	25	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.18	0.45	0.5
Uranium (dissolved)	µg/L	20	420	1.065	0.837	0.851
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.03	0.03
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	56.6	57.6	58.7
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	8	9	9
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.38	< 0.55	0.70
Selenium (dissolved)	µg/L	10	63	0.37	0.18	0.2
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	1.18	0.75	0.77

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0
Additional Parameters						
pH	-	-	-	7.68	7.64	7.64
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 98: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW13C-22

PG-MW13C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.20	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.73	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.50	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	0.16	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.73	0.40	< 1.0
Uranium (dissolved)	µg/L	20	420	0.704	0.868	0.910
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	59.3	53.7	56.2
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	11	8	< 10
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.29	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.16	0.74	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.71	1.22	1.27

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Zinc (dissolved)	µg/L	-	1,100	9.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.59	7.74	7.82
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 99: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW15A-22

PG-MW15A-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.60	1.55	1.8
Cobalt (dissolved)	µg/L	-	66	0.18	0.26	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.30	1.23	2.0
Lead (dissolved)	µg/L	10	25	0.10	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.50	0.55	< 1.0
Uranium (dissolved)	µg/L	20	420	1.662	0.768	1.055
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	88.3	99.2	105.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.148	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	12	10	< 10
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	6.41	4.78	5.40
Selenium (dissolved)	µg/L	10	63	0.07	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.94	1.26	1.90

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.86	8.09	8.36
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 100: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW15B-22

PG-MW15B-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.48	0.45	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.09	0.16	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.90	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	0.48	0.48	< 1.0
Uranium (dissolved)	µg/L	20	420	3.090	1.478	1.550
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	74.5	69.0	74.4
Beryllium (dissolved)	µg/L	-	67	0.008	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	9	9	12
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	2.02	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	0.38	0.86	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.52	0.61	0.65

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Zinc (dissolved)	µg/L	-	1,100	2.3	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.78	7.90	7.95
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 101: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW15C-22

PG-MW15C-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	3.85	2.58	2.7
Cobalt (dissolved)	µg/L	-	66	1.00	0.17	< 0.50
Copper (dissolved)	µg/L	1,000	87	2.90	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	1.26	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	2.23	0.60	< 1.0
Uranium (dissolved)	µg/L	20	420	0.867	0.658	0.715
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	174.3	128.3	132.0
Beryllium (dissolved)	µg/L	-	67	0.093	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	26	25	31
Cadmium (dissolved)	µg/L	5	2.7	0.016	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	2.50	1.68	2.40
Selenium (dissolved)	µg/L	10	63	0.05	0.53	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	5.18	0.32	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	7.8	2.8	< 5.0
Additional Parameters						
pH	-	-	-	8.04	8.05	8.11
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 102: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-MW15D-22

PG-MW15D-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	400.2	55.2	220.0
Cobalt (dissolved)	µg/L	-	66	4.41	2.97	5.93
Copper (dissolved)	µg/L	1,000	87	1.80	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	66.60	31.90	40.0
Uranium (dissolved)	µg/L	20	420	1.131	1.930	4.350
Radium-226	Bq/L	0.49	-	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.03
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	161.8	75.8	94.0
Beryllium (dissolved)	µg/L	-	67	0.016	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	16	14	17
Cadmium (dissolved)	µg/L	5	2.7	0.025	0.028	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.39	0.68	1.30
Selenium (dissolved)	µg/L	10	63	1.07	0.84	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.41	0.45	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	5.5	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.35	7.67	7.80
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 103: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-OW4-22

PG-OW4-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.06	0.21	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.75	2.20	3.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	1.15	0.55	< 1.0
Uranium (dissolved)	µg/L	20	420	3.393	3.018	3.700
Radium-226	Bq/L	0.49	-	0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.03
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	153.3	131.0	140.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.106	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	44	40	44
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.04	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.18	1.05	1.20
Selenium (dissolved)	µg/L	10	63	0.88	1.15	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.56	0.65	0.81

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.51	7.60	7.77
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 104: Port Granby Long-Term Waste Management Facility Groundwater Monitoring Well – PG-OW41-22

PG-OW41-22						
Parameter	Unit of Measure	Criteria		2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average	Average	Maximum
Primary COPC						
Antimony (dissolved)	µg/L	6	20,000	< 0.90	0.80	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.40	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.01	0.14	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.33	0.98	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.09	0.19	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.13	0.35	< 1.0
Uranium (dissolved)	µg/L	20	420	0.322	0.247	0.305
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02
Secondary COPC						
Barium (dissolved)	µg/L	1,000	29,000	20.4	22.7	25.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.105	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	13	16	21
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.025	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.03	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.30	0.43	< 0.50
Selenium (dissolved)	µg/L	10	63	0.38	0.85	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.06	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.55	0.48	0.51

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.8	< 5.0
Additional Parameters						
pH	-	-	-	7.87	7.73	7.88
<p>Notes:</p> <p>2024 averages are based on quarterly (4) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>						

Table 105: Port Granby Long-Term Waste Management Facility Groundwater Levels

Well ID	2020	2021	2022	2023	2024		
	Average				Average	Minimum	Maximum
	(mASL)				(mASL)		
PG-BH1002A	108.98	109.37	108.78	109.36	109.12	108.65	109.86
PG-BH1003A ^a	-	-	-	93.21	93.19	93.13	93.26
PG-BH1003B	111.69	111.92	111.66	111.29	110.89	110.57	111.27
PG-BH1003C	108.63	108.62	108.5	108.73	108.27	107.5	108.87
PG-BH1003D	106.54	106.55	106.01	106.37	106.24	106.07	106.61
PG-BH1003E	-	-	-	-	-	-	-
PG-BH1003F	94.69	94.5	94.45	94.57	94.45	94.43	94.47
PG-BH204-22 ^a	-	-	-	99.97	99.56	99.27	99.78
PG-BH210-22 ^a	-	-	-	80.65	80.22	80.1	80.46
PG-BH214-22 ^a	-	-	-	98.01	96.43	95.6	97.05
PG-BH404-22 ^a	-	-	-	106.14	106.32	105.75	106.8
PG-MW03-01A	80.88	77.21	78.24	79.31	81.08	80.64	81.34
PG-MW03-01B ^a	99.93	98.5	97.07	97.31	95.9	94.93	96.54
PG-MW03-01C	108.23	107.62	107.86	107.86	107.81	106.97	108.35
PG-MW03-02A	82.17	79.18	80.18	80.18	83.44	82.93	84.47
PG-MW03-02B	98.6	91.42	91.42	91.42	91.42	91.42	91.42
PG-MW03-02C	110.44	104.4	105.78	105.78	109.51	109.25	109.69
PG-MW03-03A	83.01	82.5	82.21	82.21	83.32	83.13	83.47
PG-MW03-03B	102.99	99.51	97.57	97.57	102.94	102.69	103.19
PG-MW03-03C	112.31	110.44	112.24	112.32	113.86	111.86	115.54
PG-MW1A-02	85.54	79.42	82.91	82.79	83.75	82.38	85.82
PG-MW1B-02	92.04	91.24	91.62	91.88	91.82	91.52	92.08
PG-MW1C-02	87.01	86.97	86.27	86.9	86.49	85.92	87.01
PG-MW1D-02	87.45	86.61	87.16	87.55	86.79	85.8	87.77
PG-MW2A-02	60.63	60.65	60.81	60.81	59.93	59.81	60.03
PG-MW2B-02	91.17	91.26	90.44	90.87	90.93	90.74	91.1
PG-MW2C-02	94.08	93.76	93.82	93.81	-	-	-
PG-MW3A-02	-	-	71.27	71.86	94.87	94.51	95.15
PG-MW3B-02	98.12	97.85	97.65	98.32	97.9	97.36	98.21
PG-MW3C-02	103.52	101.8	103.17	103.38	102.97	101.97	103.71
PG-MW3D-02	104.78	104.6	104.61	104.82	104.77	103.56	105.47

Well ID	2020	2021	2022	2023	2024		
	Average				Average	Minimum	Maximum
	(mASL)				(mASL)		
PG-MW4A-02	90.57	90.11	85.9	85.74	90.36	89.84	90.61
PG-MW4B-02	89.29	88.9	87.74	87.71	89.01	88.85	89.13
PG-MW4C-02	117.31	117.49	114.25	114.64	117.46	116.85	118.04
PG-MW5A-22 ^a	-	-	-	87.94	86.77	86.73	86.83
PG-MW5B-22 ^a	-	-	-	102.55	101.4	100.53	102.06
PG-MW5C-22 ^a	-	-	-	114.98	114.82	114.38	115.32
PG-MW6A-22 ^b	-	-	-	89.28	90.69	90.24	91.05
PG-MW6B-22 ^b	-	-	-	91.78	92.29	91.82	92.55
PG-MW6C-22 ^b	-	-	-	101.69	101.78	101.51	102.06
PG-MW7A-22 ^b	-	-	-	77.88	77.55	77.4	77.68
PG-MW7B-22 ^b	-	-	-	90.8	89.74	89.15	90.26
PG-MW7C-22 ^b	-	-	-	-	-	-	-
PG-MW8A-22 ^b	-	-	-	77.68	77.45	77.38	77.6
PG-MW8B-22 ^b	-	-	-	84.61	84.82	84.69	84.92
PG-MW8C-22 ^b	-	-	-	-	-	-	-
PG-MW9A-22 ^b	-	-	-	77.94	77.68	77.59	77.75
PG-MW9B-22 ^b	-	-	-	80.69	80.68	80.6	80.76
PG-MW9C-22 ^b	-	-	-	-	-	-	-
PG-MW10A-22 ^b	-	-	-	77.73	77.47	77.39	77.6
PG-MW10B-22 ^b	-	-	-	-	-	-	-
PG-MW11A-22 ^b	-	-	-	116.14	115.74	114.99	116.48
PG-MW11B-22 ^b	-	-	-	121.29	120.98	120.01	122.26
PG-MW11C-22 ^b	-	-	-	122.56	122.41	121.31	123.27
PG-MW12A-22 ^b	-	-	-	95.16	94.83	94.53	95.22
PG-MW12B-22 ^b	-	-	-	108	107.76	107.03	108.49
PG-MW12C-22 ^b	-	-	-	111.79	111.13	110.24	112.42
PG-MW13A-22 ^b	-	-	-	93.73	93.57	93.37	93.75
PG-MW13B-22 ^b	-	-	-	106.77	97.88	97.55	98.26
PG-MW13C-22 ^b	-	-	-	109.27	116.7	115.66	117.39

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Well ID	2020	2021	2022	2023	2024		
	Average				Average	Minimum	Maximum
	(mASL)				(mASL)		
PG-MW14A-22 ^b	-	-	-	102.04	102.12	101.04	102.7
PG-MW14B-22 ^b	-	-	-	104.06	104.09	103.99	104.19
PG-MW15A-22 ^b	-	-	-	88.36	88.12	87.99	88.21
PG-MW15B-22 ^b	-	-	-	99.53	98.9	98.3	99.56
PG-MW15C-22 ^b	-	-	-	105.88	105.61	105.41	105.76
PG-MW15D-22 ^b	-	-	-	112.65	112.5	112.5	110.73
PG-OW4-22 ^a	-	-	-	110.9	110.63	110.4	110.76
PG-OW41-22 ^a	-	-	-	111.7	111.52	111.04	111.91
<p>Note:</p> <p>Annual averages are based on quarterly (4) samples per year.</p> <p>a. Repaired in 2022</p> <p>b. New installation in 2022</p> <p>mASL – metres above sea level; -- indicates no data are available (e.g., well damaged, not located, or dry).</p>							

Table 106: Port Hope Long-Term Waste Management Facility Groundwater Well WC-IW93-22

WC-IW93-22									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.55	1.45	1.60	1.65	1.60	1.6
Cobalt (dissolved)	µg/L	-	66	0.01	0.02	0.01	0.01	0.01	0.01
Copper (dissolved)	µg/L	1,000	87	< 0.20	0.25	< 0.20	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.01	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	< 0.10	< 0.10	< 0.10	0.10	< 0.10	< 0.10
Uranium (dissolved)	µg/L	20	420	0.03	0.04	0.01	0.03	0.01	0.01
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	57.2	57.8	58.9	60.0	57.1	57.1
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	70	64	79	81	67	67
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	1.80	1.90	1.81	1.83	1.40	1.40
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.01	0.03	0.01	0.01	0.01	0.01

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	8.30	8.35	8.21	8.16	8.32	8.32
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 107: Port Hope Long-Term Waste Management Facility Groundwater Well WC-LTWMF-MW-06

WC-LTWMF-MW-06									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.25	1.50	1.80	1.65	1.10	1.10
Cobalt (dissolved)	µg/L	-	66	0.01	0.01	0.02	0.01	0.01	0.02
Copper (dissolved)	µg/L	1,000	87	0.50	0.30	0.35	0.45	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.03	< 0.09	< 0.09	0.15	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	12.40	< 0.10	0.45	0.10	< 0.10	< 0.10
Uranium (dissolved)	µg/L	20	420	0.33	0.94	0.86	1.06	1.15	1.25
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	35.4	72.7	78.7	75.4	84.3	88.3
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	94	138	164	155	158	158
Cadmium (dissolved)	µg/L	5	2.7	0.020	0.004	0.003	0.005	0.004	0.004
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	3.18	8.27	8.68	7.87	7.50	7.80
Selenium (dissolved)	µg/L	10	63	0.05	< 0.09	0.07	0.06	0.08	0.1
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.64	1.29	1.16	1.24	1.19	1.26

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Zinc (dissolved)	µg/L	-	1,100	22.5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.96	8.21	8.16	8.14	8.16	8.19
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 108: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW1-02

		WC-MW1-02							
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	No sample			4.95	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900				1.15	0.20	0.2
Cobalt (dissolved)	µg/L	-	66				0.11	0.07	0.08
Copper (dissolved)	µg/L	1,000	87				1.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25				0.50	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490				0.55	0.25	0.4
Uranium (dissolved)	µg/L	20	420				0.27	0.17	0.22
Radium-226	Bq/L	0.49	-				< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-				< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-				< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000				57.6	72.0	73.3
Beryllium (dissolved)	µg/L	-	67				0.039	0.008	0.01
Boron (dissolved)	µg/L	5,000	45,000				246	246	266
Cadmium (dissolved)	µg/L	5	2.7				0.017	< 0.003	0.003
Mercury (dissolved)	µg/L	1	0.29				< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200				1.89	1.55	1.60
Selenium (dissolved)	µg/L	10	63				0.22	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5				0.28	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250				0.21	0.14	0.14
Zinc (dissolved)	µg/L	-	1,100				11.0	< 2.0	< 2.0
Additional Parameters									

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pH	-	-	-					8.04	8.16	8.19
<p>Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;</p>										

Table 109: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW1-03

WC-MW1-03									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.85	1.00	1.10	2.35	0.80	0.80
Cobalt (dissolved)	µg/L	-	66	0.15	0.43	1.66	1.21	1.54	1.54
Copper (dissolved)	µg/L	1,000	87	0.40	0.35	0.20	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.60	1.10	5.00	2.00	2.20	2.2
Uranium (dissolved)	µg/L	20	420	5.58	5.06	5.81	5.08	7.97	7.97
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	140.0	166.0	182.0	186.0	187.0	187.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.01
Boron (dissolved)	µg/L	5,000	45,000	24	25	25	28	16	16
Cadmium (dissolved)	µg/L	5	2.7	0.005	< 0.003	0.005	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	9.99	3.22	4.02	3.15	2.70	2.70
Selenium (dissolved)	µg/L	10	63	0.05	0.07	< 0.04	0.10	0.19	< 0.2
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	1.20	0.16	0.18	0.23	0.08	0.08

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Zinc (dissolved)	µg/L	-	1,100	3.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.52	7.24	7.34	7.56	7.45	7.45
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 110: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW3A-11R

WC-MW3A-11R									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	4.95	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.40	< 0.20	1.45	< 0.20	< 0.20	0.2
Cobalt (dissolved)	µg/L	-	66	0.04	0.07	0.11	0.12	0.15	0.22
Copper (dissolved)	µg/L	1,000	87	1.10	< 0.20	0.30	< 0.20	1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.06	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.55	0.15	0.95	0.25	2.45	4.8
Uranium (dissolved)	µg/L	20	420	0.02	0.01	0.01	0.00	0.00	0.00
Radium-226	Bq/L	0.49	-	0.02	0.07	0.07	0.05	0.13	0.13
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	3060.0	3180.0	4415.0	3165.0	4650.0	6090.0
Beryllium (dissolved)	µg/L	-	67	0.039	< 0.007	< 0.007	< 0.007	< 0.007	0.01
Boron (dissolved)	µg/L	5,000	45,000	453	434	422	382	447	458
Cadmium (dissolved)	µg/L	5	2.7	0.017	< 0.003	0.006	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.50	0.23	0.22	0.11	< 0.40	0.40
Selenium (dissolved)	µg/L	10	63	0.22	0.06	0.05	0.08	0.05	< 0.1
Silver (dissolved)	µg/L	-	1.5	0.28	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.17	0.18	0.24	0.21	0.14	0.15
Zinc (dissolved)	µg/L	-	1,100	11.0	4.0	2.5	2.0	< 2.0	< 2.0

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Additional Parameters									
pH	-	-	-	7.64	7.45	7.48	7.48	7.48	7.57
Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;									

Table 111: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW3B-02

WC-MW3B-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	1.10	< 0.90	0.90	1.05	1.00	< 1.00
Arsenic (dissolved)	µg/L	25	1,900	1.35	1.20	2.25	1.35	1.35	1.8
Cobalt (dissolved)	µg/L	-	66	0.04	0.11	1.44	0.22	0.15	0.17
Copper (dissolved)	µg/L	1,000	87	0.35	0.20	3.35	2.35	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.13	1.67	0.19	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.20	0.20	2.40	0.40	0.30	0.3
Uranium (dissolved)	µg/L	20	420	0.31	0.32	1.47	0.59	0.66	0.77
Radium-226	Bq/L	0.49	-	< 0.01	0.01	0.01	0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	29.7	30.0	317.5	38.8	52.5	54.2
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.009	0.073	0.012	< 0.007	0.01
Boron (dissolved)	µg/L	5,000	45,000	100	91	129	95	110	110
Cadmium (dissolved)	µg/L	5	2.7	0.009	0.010	0.066	0.004	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	6.35	6.51	9.32	8.33	6.55	6.80
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	0.05	< 0.04	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.22	0.49	4.88	1.64	1.18	1.21

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Zinc (dissolved)	µg/L	-	1,100	2.5	< 2.0	64.5	2.5	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	8.36	8.33	8.46	8.36	8.30	8.37
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 112: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW3C-02

WC-MW3C-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	1.00	< 1.10
Arsenic (dissolved)	µg/L	25	1,900	4.25	2.90	5.15	6.85	3.15	4.5
Cobalt (dissolved)	µg/L	-	66	0.07	0.15	0.47	0.39	0.86	1.05
Copper (dissolved)	µg/L	1,000	87	0.25	0.85	1.60	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.01	< 0.09	0.76	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.15	0.70	1.75	1.30	3.05	4.0
Uranium (dissolved)	µg/L	20	420	2.16	2.55	2.86	1.62	2.34	3.65
Radium-226	Bq/L	0.49	-	0.03	0.01	0.02	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	115.7	179.0	357.5	178.0	293.5	319.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.022	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	44	40	58	46	57	67
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.005	0.031	< 0.003	0.014	< 0.024
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	6.71	3.86	2.50	1.97	5.25	6.40
Selenium (dissolved)	µg/L	10	63	0.06	0.05	0.07	0.06	0.11	0.1
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	1.03	1.35	1.92	0.17	0.72	1.26

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Zinc (dissolved)	µg/L	-	1,100	3.0	< 2.0	55.0	3.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.95	7.93	7.33	7.27	7.15	7.27
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 113: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW3D-02

WC-MW3D-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	1.35	1.05	< 1.65	2.30	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	4.55	1.75	1.90	3.30	1.50	1.9
Cobalt (dissolved)	µg/L	-	66	0.22	0.51	0.60	1.20	3.61	4.66
Copper (dissolved)	µg/L	1,000	87	0.20	0.50	0.65	0.90	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.95	1.85	2.05	4.15	3.45	4.6
Uranium (dissolved)	µg/L	20	420	3.18	3.28	3.85	7.53	3.78	4.92
Radium-226	Bq/L	0.49	-	0.02	< 0.01	0.01	0.03	0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	207.5	358.5	323.0	366.0	286.5	295.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.011	0.01
Boron (dissolved)	µg/L	5,000	45,000	53	54	61	54	42	43
Cadmium (dissolved)	µg/L	5	2.7	0.006	0.007	0.014	0.014	0.010	0.011
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.06	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	5.14	4.35	6.15	7.10	0.90	1.10
Selenium (dissolved)	µg/L	10	63	0.19	0.28	0.26	0.37	0.19	0.3
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	2.21	3.77	4.86	6.17	0.65	0.92

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Zinc (dissolved)	µg/L	-	1,100	2.0	< 2.0	< 2.0	2.5	5.5	9.0
Additional Parameters									
pH	-	-	-	7.71	7.56	7.27	7.26	6.82	6.95
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 114: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW4A-02

WC-MW4A-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	5.45	5.20	5.30	5.15	4.80	5.0
Cobalt (dissolved)	µg/L	-	66	0.03	0.03	0.06	0.02	0.03	0.03
Copper (dissolved)	µg/L	1,000	87	< 0.20	< 0.20	0.25	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.03	< 0.09	0.16	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.10	< 0.10	0.30	0.10	0.25	0.4
Uranium (dissolved)	µg/L	20	420	0.78	0.47	0.37	0.33	0.29	0.32
Radium-226	Bq/L	0.49	-	0.01	< 0.01	0.02	0.02	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	96.8	99.3	207.0	102.5	110.0	116.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	20	20	35	22	23	25
Cadmium (dissolved)	µg/L	5	2.7	0.005	< 0.003	0.033	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	1.49	1.91	1.65	1.59	1.45	1.50
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.06	0.04	0.17	0.03	0.02	0.03

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Zinc (dissolved)	µg/L	-	1,100	2.5	< 2.0	46.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.96	8.10	8.02	7.89	7.99	8.07
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 115: Port Hope Long-Term Waste Management Facility Groundwater Well WC-MW4B-02

WC-MW4B-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.95	1.10	1.35	1.20	1.05	1.5
Cobalt (dissolved)	µg/L	-	66	0.34	0.02	0.02	0.11	0.14	0.18
Copper (dissolved)	µg/L	1,000	87	0.35	0.35	0.30	0.60	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	< 0.09	< 0.09	0.13	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.80	0.25	0.25	0.45	0.45	0.5
Uranium (dissolved)	µg/L	20	420	3.14	1.19	1.22	0.98	1.11	1.25
Radium-226	Bq/L	0.49	-	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	140.5	129.5	139.0	155.5	187.5	199.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	30	22	23	25	27	27
Cadmium (dissolved)	µg/L	5	2.7	0.007	0.008	0.006	0.006	0.005	0.006
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	7.71	11.15	9.54	12.67	10.55	12.70
Selenium (dissolved)	µg/L	10	63	0.05	< 0.04	< 0.04	0.05	0.05	0.1
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.54	0.95	1.01	0.93	0.84	1.04

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Zinc (dissolved)	µg/L	-	1,100	2.5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	8.03	8.03	7.90	7.90	7.76	7.78
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 116: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW1-87

WC-OW1-87									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.80	0.90	1.15	4.20	13.35	25.5
Cobalt (dissolved)	µg/L	-	66	0.45	0.72	0.72	33.69	114.2	174.0
Copper (dissolved)	µg/L	1,000	87	0.30	0.35	0.30	12.65	47.00	54.0
Lead (dissolved)	µg/L	10	25	0.02	< 0.09	< 0.09	3.58	6.05	10.0
Nickel (dissolved)	µg/L	-	490	0.60	1.15	1.50	48.15	141.00	185.0
Uranium (dissolved)	µg/L	20	420	3.82	3.92	2.83	3.28	3.58	3.58
Radium-226	Bq/L	0.49	-	< 0.01	0.01	< 0.01	0.02	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	88.9	104.4	114.4	169.5	152.5	155.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.013	0.015	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	16	15	14	14	14	15
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.006	0.012	0.285	0.580	0.869
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.35	0.39	0.40	0.35	< 0.40	0.40
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.05	0.12	1.22	0.07	0.1
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.11	0.12	0.12	0.63	0.45	0.64
Zinc (dissolved)	µg/L	-	1,100	2.0	2.5	< 2.0	58.5	152.0	240.0

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Additional Parameters									
pH	-	-	-	7.58	7.43	7.43	7.44	7.21	7.28
Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;									

Table 117: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW2A-75 and WC-OW2A-19

WC-OW2A-19									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.55	0.70	0.40	1.50	0.55	0.8
Cobalt (dissolved)	µg/L	-	66	0.41	0.53	0.44	0.08	0.87	0.91
Copper (dissolved)	µg/L	1,000	87	0.45	0.35	0.25	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.03	0.08	< 0.09	< 0.09	0.38	0.66
Nickel (dissolved)	µg/L	-	490	0.70	0.85	0.85	0.15	1.40	1.4
Uranium (dissolved)	µg/L	20	420	2.67	5.58	5.53	0.09	6.49	7.02
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	146.0	116.5	99.5	29.4	116.5	120.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.016	0.02
Boron (dissolved)	µg/L	5,000	45,000	11	11	15	7	11	13
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.011	0.005	0.006	0.008	0.009
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.39	0.30	0.59	11.10	< 0.40	< 0.40
Selenium (dissolved)	µg/L	10	63	0.06	0.12	0.13	0.10	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.21	0.30	0.18	0.09	0.55	0.91

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Zinc (dissolved)	µg/L	-	1,100	2.0	4.5	4.0	< 2.0	3.0	3.0
Additional Parameters									
pH	-	-	-	7.50	7.42	7.37	7.56	7.41	7.50
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 118: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW2-87 and WC-OW2-19

WC-OW2-19									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.50	1.75	1.25	0.40	1.55	1.6
Cobalt (dissolved)	µg/L	-	66	0.06	0.07	0.07	0.67	0.09	0.12
Copper (dissolved)	µg/L	1,000	87	< 0.20	0.25	< 0.20	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.06	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.15	0.15	0.30	1.00	0.20	0.3
Uranium (dissolved)	µg/L	20	420	0.13	0.10	0.09	6.21	0.09	0.10
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	25.3	26.0	26.3	109.9	28.6	29.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	9	9	9	10	9	11
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.028	0.006	< 0.003	0.003	0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.01
Molybdenum (dissolved)	µg/L	-	9,200	9.46	11.63	13.40	0.29	11.00	11.10
Selenium (dissolved)	µg/L	10	63	0.06	0.08	0.10	0.06	0.05	0.1
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.08	0.07	0.08	0.22	0.07	0.08

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	5.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.66	7.42	7.58	7.45	7.70	7.76
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 119: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW3-79

WC-OW3-79									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	3.75	3.70	4.00	3.35	3.25	3.4
Cobalt (dissolved)	µg/L	-	66	0.01	0.01	0.01	0.01	0.08	0.15
Copper (dissolved)	µg/L	1,000	87	0.35	< 0.20	< 0.20	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.04	0.05	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	< 0.10	1.00	< 0.10	< 0.10	2.20	4.3
Uranium (dissolved)	µg/L	20	420	0.04	0.04	0.04	0.06	0.29	0.52
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	135.0	138.0	148.0	150.0	128.0	141.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	20	20	21	33	19	19
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.008	0.003	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	1.21	1.12	1.26	1.18	1.70	2.20
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.02	0.07	0.02	0.02	0.06	0.07

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Zinc (dissolved)	µg/L	-	1,100	3.5	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	8.17	7.97	8.01	7.93	7.99	8.00
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 120: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW3-87

WC-OW3-87									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	5.05	5.00	5.70	5.65	5.15	5.5
Cobalt (dissolved)	µg/L	-	66	0.02	0.03	0.03	0.03	0.06	0.08
Copper (dissolved)	µg/L	1,000	87	0.20	< 0.20	< 0.20	< 0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.01	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.15	0.20	0.20	0.10	0.85	1.6
Uranium (dissolved)	µg/L	20	420	0.15	0.68	0.09	0.08	0.12	0.12
Radium-226	Bq/L	0.49	-	0.01	0.01	< 0.01	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	160.0	160.0	173.5	174.0	178.0	187.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	12	14	13	11	12	13
Cadmium (dissolved)	µg/L	5	2.7	0.004	< 0.003	< 0.003	0.004	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.25	0.37	0.49	0.28	< 0.40	< 0.40
Selenium (dissolved)	µg/L	10	63	< 0.04	0.06	< 0.04	< 0.04	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.07	0.13	0.10	0.03	0.03	0.03

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Zinc (dissolved)	µg/L	-	1,100	2.5	2.5	2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.99	7.87	7.86	7.80	7.96	8.04
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 121: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW4-79

WC-OW4-79									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.65	0.80	0.60	0.45	0.60	1.0
Cobalt (dissolved)	µg/L	-	66	0.10	0.19	0.15	0.19	0.43	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.40	0.25	0.20	2.00	0.97	1.0
Lead (dissolved)	µg/L	10	25	0.02	0.20	< 0.09	0.52	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.30	0.60	1.05	2.05	1.30	1.4
Uranium (dissolved)	µg/L	20	420	0.09	0.08	0.09	0.21	0.11	0.11
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	74.0	112.0	109.5	108.5	93.0	94.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.021	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	42	31	34	25	22	22
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	0.014	< 0.003	0.048	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.05	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.15	1.13	1.20	1.06	1.35	1.40
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	0.09	< 0.04	1.02	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.90	0.02	0.01	< 0.01	0.26	0.50

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Zinc (dissolved)	µg/L	-	1,100	12.0	14.0	9.0	10.5	41.0	53.0
Additional Parameters									
pH	-	-	-	7.99	7.66	7.65	7.65	7.79	7.79
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 122: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW5-19

WC-OW5-19									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	3.35	3.35	2.70	4.45	4.30	4.4
Cobalt (dissolved)	µg/L	-	66	0.35	0.35	0.35	0.47	0.47	0.49
Copper (dissolved)	µg/L	1,000	87	< 0.20	< 0.20	< 0.20	< 0.20	< 1.00	1.0
Lead (dissolved)	µg/L	10	25	0.01	< 0.01	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.75	0.75	0.90	1.15	1.15	1.2
Uranium (dissolved)	µg/L	20	420	0.11	0.11	0.06	0.07	0.10	0.16
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	23.9	23.9	21.1	23.1	24.8	27.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.007	< 0.007	< 0.007	0.008	0.01
Boron (dissolved)	µg/L	5,000	45,000	18	18	18	16	17	17
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	0.003	0.017	0.031
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.60	0.60	1.33	0.90	1.00	1.30
Selenium (dissolved)	µg/L	10	63	0.25	0.25	0.22	0.21	0.21	0.2
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.20	0.20	0.16	0.22	0.22	0.23

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.20	7.20	7.32	7.08	7.20	7.29
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 123: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW10-75

WC-OW10-75									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	2.80	2.80	3.05	3.15	2.95	3.0
Cobalt (dissolved)	µg/L	-	66	0.01	0.03	0.03	0.03	0.03	0.03
Copper (dissolved)	µg/L	1,000	87	< 0.20	0.20	< 0.20	0.20	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.07	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	< 0.10	1.45	< 0.10	0.10	0.15	0.2
Uranium (dissolved)	µg/L	20	420	0.03	0.03	0.03	0.03	0.03	0.03
Radium-226	Bq/L	0.49	-	0.02	0.01	< 0.02	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	153.5	154.0	162.5	168.0	159.5	160.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.015	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	12	13	14	15	13	13
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.018	0.013	0.011	0.010	< 0.017
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.75	0.98	0.90	0.86	0.75	< 0.80
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	0.15	0.10	< 0.04	< 0.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	< 0.01	0.07	0.04	0.05	0.04	0.06

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.5	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	8.01	8.00	7.94	8.02	7.96	8.11
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 124: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW25-76

WC-OW25-76									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.75	0.70	0.80	0.70	0.80	1.0
Cobalt (dissolved)	µg/L	-	66	0.10	0.04	0.04	0.03	0.27	0.50
Copper (dissolved)	µg/L	1,000	87	0.25	< 0.20	0.60	0.50	< 1.00	1.0
Lead (dissolved)	µg/L	10	25	0.07	0.01	< 0.09	0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.25	< 0.10	0.10	0.20	0.65	< 1.0
Uranium (dissolved)	µg/L	20	420	0.14	0.13	0.12	0.14	0.15	0.16
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	0.04	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	0.04	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	69.5	35.3	31.3	37.7	44.4	48.8
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.009	0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	41	61	54	56	57	58
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.005	0.012	< 0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	--	--	--	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.35	1.23	1.22	1.00	0.90	0.99
Selenium (dissolved)	µg/L	10	63	< 0.04	0.05	0.05	< 0.04	1.03	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.88	1.47	1.44	1.35	1.52	1.64

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Zinc (dissolved)	µg/L	-	1,100	9.5	2.0	5.0	< 2.0	5.5	6.0
Additional Parameters									
pH	-	-	-	7.75	--	--	--	7.97	7.97
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 125: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW27-76

WC-OW27-76									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.35	0.35	0.35	0.35	0.65	1.0
Cobalt (dissolved)	µg/L	-	66	0.05	0.07	0.07	0.13	0.28	0.50
Copper (dissolved)	µg/L	1,000	87	0.30	0.25	0.25	< 0.20	0.95	1.0
Lead (dissolved)	µg/L	10	25	0.02	0.09	0.20	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.45	0.50	0.35	0.35	0.65	1.0
Uranium (dissolved)	µg/L	20	420	0.14	0.13	0.13	0.13	0.11	0.13
Radium-226	Bq/L	0.49	-	0.01	< 0.01	0.01	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	158.0	156.0	171.5	205.0	212.0	214.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	39	45	40	28	42	47
Cadmium (dissolved)	µg/L	5	2.7	0.008	0.005	0.016	< 0.003	0.048	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.52	0.48	0.60	0.27	0.52	0.63
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	0.08	< 0.04	1.02	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.56	0.42	0.49	0.57	0.46	0.50

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Zinc (dissolved)	µg/L	-	1,100	2.0	5.5	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.81	7.62	7.57	7.63	7.80	7.86
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;.</p>									

Table 126: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW28-76

WC-OW28-76									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.60	0.50	0.50	0.35	0.85	1.0
Cobalt (dissolved)	µg/L	-	66	0.03	0.03	0.06	0.06	0.30	0.50
Copper (dissolved)	µg/L	1,000	87	0.45	1.20	0.60	0.20	0.95	< 1.0
Lead (dissolved)	µg/L	10	25	0.05	0.04	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.35	1.00	5.50	0.20	1.65	1.8
Uranium (dissolved)	µg/L	20	420	0.17	0.19	0.18	0.16	0.19	0.21
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.04
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	0.04	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	80.7	101.0	92.8	183.5	82.4	83.8
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.013	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	93	80	70	28	80	81
Cadmium (dissolved)	µg/L	5	2.7	0.005	< 0.003	0.007	< 0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	--	--	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	1.16	1.21	1.33	0.30	1.20	1.30
Selenium (dissolved)	µg/L	10	63	< 0.04	< 0.04	0.09	< 0.04	1.02	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.84	0.64	0.80	0.37	0.59	0.65

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Zinc (dissolved)	µg/L	-	1,100	3.5	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	8.10	--	--	7.83	--	--
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 127: Port Hope Long-Term Waste Management Facility Groundwater Well WC-OW33-76

WC-OW33-76									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	1.20	0.60	1.20	3.30	2.75	2.9
Cobalt (dissolved)	µg/L	-	66	0.12	0.24	0.18	0.14	0.14	0.20
Copper (dissolved)	µg/L	1,000	87	0.50	0.40	0.30	0.30	< 1.00	< 1.0
Lead (dissolved)	µg/L	10	25	0.16	< 0.09	< 0.09	0.17	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.30	0.60	7.70	0.20	0.20	0.3
Uranium (dissolved)	µg/L	20	420	1.51	3.35	2.86	1.87	1.86	1.91
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	0.05	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	76.1	87.0	89.6	94.4	99.5	110.0
Beryllium (dissolved)	µg/L	-	67	0.008	< 0.007	< 0.007	0.014	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	92	38	38	46	46	51
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.003	< 0.003	0.004	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	4.92	3.37	3.28	3.68	3.00	3.60
Selenium (dissolved)	µg/L	10	63	0.06	< 0.04	0.06	0.07	0.07	0.1
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.88	0.02	0.10	0.37	0.14	0.16

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.36	7.60	7.50	7.78	7.76	7.77
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 128: Port Hope Long-Term Waste Management Facility Groundwater Levels

Well ID	2020	2021	2022	2023	2024		
	Average				Average	Minimum	Maximum
	(mASL)				(mASL)		
WC-IW93-22	123.47	123.48	123.18	123.19	123.74	123.71	123.76
WC-MW1-02				128.98	127.81	127.14	128.44
WC-MW1-03	148.16	148.25	148.39	147.9	148.09	146.87	148.54
WC-MW2-02				115.09	116.23	115.86	116.47
WC-MW3A-11R ^a	-	-	-	-	-	-	-
WC-MW3B-02	130.72	130.11	129.67	127.31	129.14	128.73	129.6
WC-MW3C-02	135.81	135.56	135.58	135.03	134.38	133.52	135.47
WC-MW3D-02	136.86	136.46	136.45	136.3	137.83	136.51	138.75
WC-MW4A-02	126.87	126.62	126.66	126.52	127.51	126.19	130.87
WC-MW4B-02	126.92	126.94	126.74	126.7	126.67	126.45	126.88
WC-OW1-87	116.42	116.43	115.57	115.86	115.93	115.49	116.43
WC-OW2A-19 ^b	119.76	120.04	119.45	119.75	119.87	119.19	120.62
WC-OW2-19 ^c	120.38	120.54	120.06	120.36	120.4	119.86	121.12
WC-OW3-79	116.73	116.71	115.41	115.8	116.01	115.42	116.6
WC-OW3-87	118.76	118.79	118.02	118.59	118.68	118.35	119.04
WC-OW4-79	120.23	120.34	119.91	120.2	120.31	119.69	121.05
WC-OW5-19 ^d	120.23	120.34	119.91	120.2	120.31	119.69	121.05
LTWMMF-MW-06 ^e	138.09	138.42	137.86	137.98	138.33	138.13	138.61
WC-OW10-75	140.14	140.33	139.85	140.1	140.12	139.12	141.22
WC-OW25-76	118.66	118.71	118.52	118.51	118.68	118.51	118.85
WC-OW-27-76	120.71	120.93	120.6	120.19	120.69	120.09	121.07
WC-OW28-76	120.36	120.48	120.45	120.91	120.64	120.17	121.53
WC-OW33-76	123.54	123.43	123.94	123.21	123.1	122.36	123.63

Note:

Annual averages are based on quarterly (4) samples per year.

a. WC-MW3A-11R was installed in 2011 to replace WC-MW3A-02.

b. WC-OW2A-19 was installed in 2019 to replace WC-OW2A-75.

c. WC-OW2-19 was installed in 2019 to replace WC-OW2-87.

d. WC-OW5-19 was installed in 2019 to replace WC-OW5-79.

e. LTWMF-MW-06 was installed in 2017 to replace WC-OW9-75
mASL – metres above sea level; – indicates no data are available.

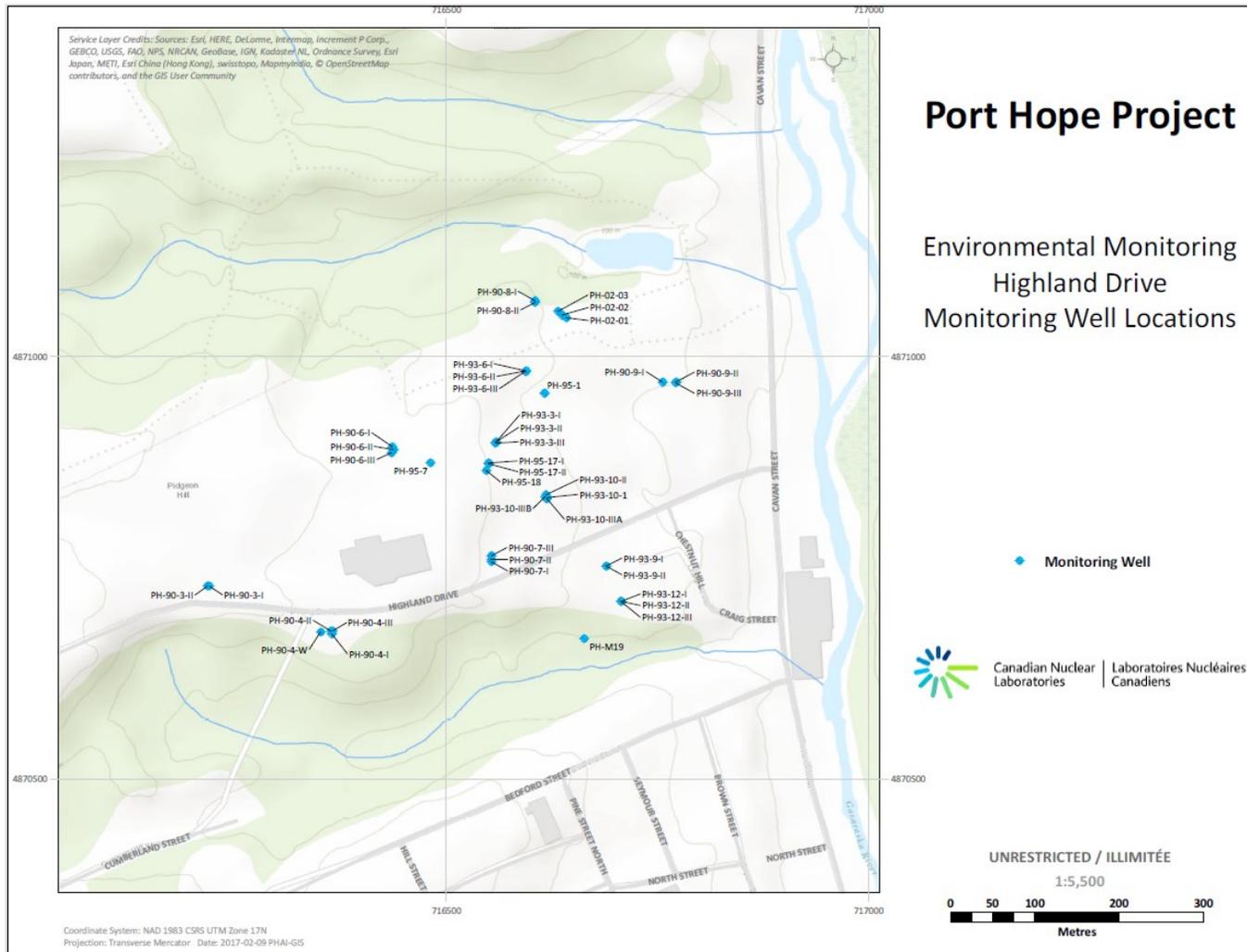


Figure 23: Port Hope Project Highland Drive Groundwater Monitoring Well Locations

Table 129: Highland Drive Groundwater Well PH-02-01

PH-02-01									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.20	< 0.20	< 0.20	< 0.20	0.60	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.05	0.06	0.08	0.05	0.28	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.55	1.05	1.35	1.15	1.60	2.2
Lead (dissolved)	µg/L	10	25	0.02	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.25	0.20	0.30	0.25	1.30	2.1
Uranium (dissolved)	µg/L	20	420	2.91	3.03	3.13	3.22	3.49	4.40
Radium-226	Bq/L	0.49	-	0.02	0.01	0.01	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	22.5	32.7	34.7	23.6	47.2	55.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	25	25	21	18	98	170
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.44	0.40	0.43	0.49	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.57	0.42	0.47	0.75	2.08	2.2
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.31	0.35	0.44	0.29	0.39	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	2.5	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.43	7.46	7.43	7.32	7.38	7.64

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 130: Highland Drive Groundwater Well PH-02-02

PH-02-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.25	< 0.20	0.60	< 0.20	0.60	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.13	0.10	0.16	0.09	0.30	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.80	1.35	2.75	1.50	1.95	2.0
Lead (dissolved)	µg/L	10	25	< 0.05	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.75	0.25	0.90	0.50	0.90	< 1.0
Uranium (dissolved)	µg/L	20	420	2.08	2.94	3.00	2.60	5.88	6.25
Radium-226	Bq/L	0.49	-	< 0.01	0.01	0.02	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	33.3	47.6	49.3	59.6	66.6	77.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.028	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	32	30	35	28	36	49
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.004	0.077	0.003	0.048	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.28	0.46	0.78	0.40	0.55	0.70
Selenium (dissolved)	µg/L	10	63	0.27	0.32	1.22	0.57	1.11	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.43	0.37	0.38	0.34	0.46	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.37	7.50	7.32	7.19	7.39	7.69

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

Table 131: Highland Drive Groundwater Well PH-02-03

PH-02-03									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	< 0.20	0.60	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.13	0.21	0.22	0.23	0.35	< 0.50
Copper (dissolved)	µg/L	1,000	87	1.50	1.60	2.55	1.75	2.20	2.4
Lead (dissolved)	µg/L	10	25	< 0.01	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.65	0.45	0.70	0.55	0.85	< 1.0
Uranium (dissolved)	µg/L	20	420	10.48	14.05	13.85	17.90	27.15	35.30
Radium-226	Bq/L	0.49	-	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	20.2	28.3	29.3	37.7	37.9	43.8
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	22	23	20	31	37	52
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	0.003	0.006	0.005	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.23	0.30	0.41	0.42	0.75	1.10
Selenium (dissolved)	µg/L	10	63	0.08	0.10	0.09	0.21	1.04	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.16	0.21	0.24	0.21	0.37	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.43	7.53	7.47	7.28	7.57	7.83

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

Table 132: Highland Drive Groundwater Well PH-90-3-I

PH-90-3-I									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	0.30	0.60	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.17	0.09	0.12	0.13	0.30	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.35	< 0.20	0.35	< 0.20	0.95	< 1.0
Lead (dissolved)	µg/L	10	25	0.04	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	0.10	0.10	< 0.10	0.55	< 1.0
Uranium (dissolved)	µg/L	20	420	2.02	1.88	1.74	1.83	1.99	2.10
Radium-226	Bq/L	0.49	-	< 0.01	0.01	0.02	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	287.0	308.5	271.5	256.5	274.0	290.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	13	13	23	20	13	14
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	0.006	< 0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.41	0.35	0.38	0.42	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.34	0.29	0.38	0.42	1.15	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.21	0.22	0.22	0.32	0.35	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	4.0	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.88	7.80	7.80	7.71	7.65	7.94

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

Table 133: Highland Drive Groundwater Well PH-90-4-III

PH-90-4-III									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	8.10	11.95	8.80	6.50	6.40	6.80
Cobalt (dissolved)	µg/L	-	66	16.73	28.60	23.10	12.12	13.85	16.00
Copper (dissolved)	µg/L	1,000	87	1.70	0.30	0.35	7.20	0.95	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.01	< 0.06	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	5.80	9.20	6.25	5.65	4.90	5.8
Uranium (dissolved)	µg/L	20	420	39.54	67.10	51.00	35.65	43.90	47.00
Radium-226	Bq/L	0.49	-	0.03	0.05	0.04	0.04	0.02	0.03
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	352.0	530.0	710.0	466.0	527.0	544.0
Beryllium (dissolved)	µg/L	-	67	0.012	0.008	0.008	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	501	2085	949	144	274	470
Cadmium (dissolved)	µg/L	5	2.7	0.007	0.009	0.005	< 0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.36	0.35	0.28	0.30	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.21	0.13	0.10	0.27	1.24	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.39	0.42	0.36	0.35	0.42	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	2.5	2.0	< 2.0	2.5	3.5	< 5.0
Additional Parameters									
pH	-	-	-	6.76	6.61	6.68	6.82	7.29	7.57

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 134: Highland Drive Groundwater Well PH-90-7-III

PH-90-7-III									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	0.95	< 0.90	< 0.90	1.00	2.50	4.10
Arsenic (dissolved)	µg/L	25	1,900	50.90	27.60	24.55	26.95	21.80	27.00
Cobalt (dissolved)	µg/L	-	66	1.57	3.22	4.42	1.63	2.81	3.70
Copper (dissolved)	µg/L	1,000	87	0.45	0.65	0.55	1.35	0.95	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	< 0.09	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.85	1.25	1.05	0.85	0.75	< 1.0
Uranium (dissolved)	µg/L	20	420	23.69	14.85	20.75	26.05	22.05	29.00
Radium-226	Bq/L	0.49	-	0.05	0.04	0.06	0.04	0.03	0.04
Thorium-230	Bq/L	0.65	-	0.05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	109.0	108.5	112.3	68.6	86.5	120.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.030	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	17	36	65	16	15	20
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.015	0.010	0.016	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.19	0.15	0.29	0.37	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.07	0.07	0.05	0.08	1.03	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.90	0.32	0.43	0.62	0.31	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	3.0	2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.17	7.20	7.57	7.26	7.35	7.48

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

Table 135: Highland Drive Groundwater Well PH-90-8-I

PH-90-8-I									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	2.70	0.45	0.35	0.40	0.65	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.20	0.28	0.34	0.31	0.39	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.35	< 0.20	0.45	0.40	0.95	< 1.0
Lead (dissolved)	µg/L	10	25	< 0.01	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.40	0.40	0.90	1.00	1.10	< 1.2
Uranium (dissolved)	µg/L	20	420	35.65	37.50	34.31	36.35	18.70	33.30
Radium-226	Bq/L	0.49	-	0.02	0.02	0.02	0.02	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	450.5	457.5	435.5	365.5	269.5	389.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	29	40	42	39	39	41
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	0.005	< 0.003	0.048	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.51	0.89	0.60	0.53	0.50	< 0.50
Selenium (dissolved)	µg/L	10	63	< 0.04	0.05	< 0.04	0.08	1.02	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.12	0.27	0.11	0.09	0.34	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	3.0	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.50	7.57	7.55	7.46	7.53	7.57

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

Table 136: Highland Drive Groundwater Well PH-90-8-II

PH-90-8-II									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.20	< 0.20	< 0.20	0.60	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.16	0.11	0.12	0.08	0.28	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.75	0.35	0.65	0.55	1.45	< 2.0
Lead (dissolved)	µg/L	10	25	< 0.01	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.30	0.20	0.40	0.30	0.85	< 1.0
Uranium (dissolved)	µg/L	20	420	4.58	17.35	15.50	3.04	19.85	32.00
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	70.2	73.9	76.1	81.2	279.0	410.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	44	38	40	33	38	45
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	< 0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.07	0.30	0.09	0.05	0.48	0.55
Selenium (dissolved)	µg/L	10	63	0.47	0.53	0.42	0.41	1.19	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.18	0.39	0.37	0.33	0.42	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	3.0	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.25	7.40	7.46	7.12	7.56	7.78

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 137: Highland Drive Groundwater Well PH-90-9-III

PH-90-9-III									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	0.35	0.30	< 0.20	0.60	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.04	0.17	0.18	0.05	0.26	< 0.50
Copper (dissolved)	µg/L	1,000	87	0.50	0.50	0.25	0.40	0.95	< 1.0
Lead (dissolved)	µg/L	10	25	0.05	0.06	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	< 0.10	0.25	0.30	0.15	0.60	< 1.0
Uranium (dissolved)	µg/L	20	420	2.91	3.03	3.29	3.20	3.30	3.80
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	58.3	61.9	63.7	57.0	56.3	57.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	18	23	66	19	20	20
Cadmium (dissolved)	µg/L	5	2.7	0.003	0.003	< 0.003	< 0.003	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.14	0.21	0.18	0.18	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.20	0.19	0.22	0.17	1.11	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.36	0.41	0.29	0.32	0.41	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	4.0	2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.70	7.47	7.43	7.39	7.64	7.80
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 138: Highland Drive Groundwater Well PH-93-3-III

PH-93-3-III									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	< 0.20	< 0.20	< 0.20	0.20	< 0.20	< 0.20
Cobalt (dissolved)	µg/L	-	66	0.18	0.10	0.13	0.11	0.14	0.14
Copper (dissolved)	µg/L	1,000	87	0.50	0.60	0.70	1.45	2.00	2.0
Lead (dissolved)	µg/L	10	25	< 0.01	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Nickel (dissolved)	µg/L	-	490	0.10	0.30	0.30	0.30	0.40	0.4
Uranium (dissolved)	µg/L	20	420	9.03	36.97	29.50	41.45	16.70	16.70
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	--	< 0.02	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	--	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	--	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	51.6	48.6	50.6	60.0	58.3	58.3
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (dissolved)	µg/L	5,000	45,000	243	71	201	102	195	195
Cadmium (dissolved)	µg/L	5	2.7	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (dissolved)	µg/L	-	9,200	0.06	0.14	0.10	0.11	< 0.40	< 0.40
Selenium (dissolved)	µg/L	10	63	0.41	0.33	0.54	0.54	0.22	0.2
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (dissolved)	µg/L	-	250	0.53	0.73	0.72	0.89	0.59	0.59

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
pH	-	-	-	7.35	--	--	7.61	7.47	7.47

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit;

Table 139: Highland Drive Groundwater Well PH-93-6-I

PH-93-6-I									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.65	0.45	1.05	1.20	0.70	< 1.0
Cobalt (dissolved)	µg/L	-	66	1.10	0.87	1.12	1.70	1.19	1.28
Copper (dissolved)	µg/L	1,000	87	0.75	0.75	1.30	0.55	< 0.95	< 1.0
Lead (dissolved)	µg/L	10	25	0.02	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	2.05	1.70	1.30	2.25	1.90	1.9
Uranium (dissolved)	µg/L	20	420	2.06	2.08	2.35	3.60	4.60	6.20
Radium-226	Bq/L	0.49	-	0.02	< 0.01	0.02	0.02	< 0.02	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	334.0	380.5	176.8	339.5	368.5	370.0
Beryllium (dissolved)	µg/L	-	67	0.008	< 0.007	0.008	0.011	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	87	71	74	100	67	72
Cadmium (dissolved)	µg/L	5	2.7	0.048	0.075	0.005	0.022	0.059	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.45	0.50	0.62	0.39	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.37	0.39	0.35	0.52	1.22	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.53	0.58	1.41	1.61	0.63	< 0.76

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Zinc (dissolved)	µg/L	-	1,100	42.5	18.5	< 2.0	6.5	5.0	< 5.0
Additional Parameters									
pH	-	-	-	7.61	7.64	7.62	7.20	7.52	7.60

Notes:
 2024 averages are based on semi-annual (2) sampling results.
Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit.

Table 140: Highland Drive Groundwater Well PH-93-6-II

PH-93-6-II									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.35	0.20	0.40	0.40	0.65	< 1.0
Cobalt (dissolved)	µg/L	-	66	0.38	0.60	0.54	0.68	0.78	0.83
Copper (dissolved)	µg/L	1,000	87	1.00	1.00	1.55	1.75	1.50	2.0
Lead (dissolved)	µg/L	10	25	0.02	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	0.80	1.15	0.90	1.05	1.15	1.2
Uranium (dissolved)	µg/L	20	420	35.80	59.35	21.27	31.55	27.35	27.70
Radium-226	Bq/L	0.49	-	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	49.7	82.3	44.9	49.3	74.6	79.0
Beryllium (dissolved)	µg/L	-	67	0.008	< 0.007	< 0.007	0.009	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	45	49	46	43	41	55
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.004	0.007	0.007	0.049	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.02	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.13	0.14	0.14	0.21	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.16	0.13	0.17	0.37	1.07	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.27	0.38	0.50	0.89	0.75	0.86

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Zinc (dissolved)	µg/L	-	1,100	2.5	3.5	4.0	13.5	4.5	< 5.0
Additional Parameters									
pH	-	-	-	7.30	7.37	7.43	7.16	7.56	7.90
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 141: Highland Drive Groundwater Well PH-93-9-I

PH-93-9-I									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	Decommissioned	
Arsenic (dissolved)	µg/L	25	1,900	0.55	0.55	0.40	0.60		
Cobalt (dissolved)	µg/L	-	66	2.66	2.94	2.86	2.78		
Copper (dissolved)	µg/L	1,000	87	4.30	3.60	5.25	7.10		
Lead (dissolved)	µg/L	10	25	0.03	0.25	< 0.09	< 0.09		
Nickel (dissolved)	µg/L	-	490	8.85	8.50	7.20	7.40		
Uranium (dissolved)	µg/L	20	420	2,075.0	7,150.0	9,915.0	7,390.0		
Radium-226	Bq/L	0.49	-	0.02	0.02	0.02	0.03		
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02		
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02		
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	166.0	222.0	249.0	235.5		
Beryllium (dissolved)	µg/L	-	67	< 0.007	0.008	< 0.007	0.019		
Boron (dissolved)	µg/L	5,000	45,000	949	1285	1665	1335		
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.005	0.004	0.034		
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.01	< 0.01	< 0.01		
Molybdenum (dissolved)	µg/L	-	9,200	0.24	0.25	0.20	0.21		
Selenium (dissolved)	µg/L	10	63	0.17	0.26	1.96	2.28		
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05		
Vanadium (dissolved)	µg/L	-	250	0.33	0.48	0.81	0.73		

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Zinc (dissolved)	µg/L	-	1,100	5.0	2.5	< 2.0	< 2.0		
Additional Parameters									
pH	-	-	-	7.08	7.09	7.21	6.97		

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 142: Highland Drive Groundwater Well PH-93-9-II

PH-93-9-II									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	Decommissioned	
Arsenic (dissolved)	µg/L	25	1,900	0.20	< 0.20	0.25	< 0.20		
Cobalt (dissolved)	µg/L	-	66	0.15	0.12	0.13	0.20		
Copper (dissolved)	µg/L	1,000	87	0.60	0.50	0.45	0.35		
Lead (dissolved)	µg/L	10	25	0.02	0.05	< 0.09	< 0.09		
Nickel (dissolved)	µg/L	-	490	< 0.10	0.30	0.35	0.25		
Uranium (dissolved)	µg/L	20	420	7.73	8.11	18.30	11.18		
Radium-226	Bq/L	0.49	-	< 0.01	0.02	< 0.01	< 0.01		
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02		
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02		
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	46.5	52.9	50.5	49.8		
Beryllium (dissolved)	µg/L	-	67	0.008	< 0.007	< 0.007	< 0.007		
Boron (dissolved)	µg/L	5,000	45,000	35	747	99	23		
Cadmium (dissolved)	µg/L	5	2.7	0.011	0.011	0.005	0.014		
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.02	< 0.01	< 0.01		
Molybdenum (dissolved)	µg/L	-	9,200	0.76	0.61	0.44	0.32		
Selenium (dissolved)	µg/L	10	63	0.80	0.73	0.76	0.79		
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05		
Vanadium (dissolved)	µg/L	-	250	0.35	0.27	0.48	0.35		

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Zinc (dissolved)	µg/L	-	1,100	3.5	3.0	5.0	4.0		
Additional Parameters									
pH	-	-	-	7.33	7.48	7.57	7.41		

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 143: Highland Drive Groundwater Well PH-93-10-I

PH-93-10-I									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	24.30	20.50	30.90	29.35	18.60	30.20
Cobalt (dissolved)	µg/L	-	66	8.25	6.37	6.69	8.00	7.49	7.67
Copper (dissolved)	µg/L	1,000	87	2.15	0.50	0.25	0.35	1.00	1.0
Lead (dissolved)	µg/L	10	25	0.31	0.06	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	11.35	9.10	8.10	11.15	9.85	11.0
Uranium (dissolved)	µg/L	20	420	4.795	3.055	3.050	4.150	2.185	2.270
Radium-226	Bq/L	0.49	-	0.03	0.02	0.03	0.02	< 0.02	0.02
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	622.5	494.0	564.0	570.5	566.5	593.0
Beryllium (dissolved)	µg/L	-	67	0.019	< 0.007	0.010	0.014	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	683	378	560	575	514	530
Cadmium (dissolved)	µg/L	5	2.7	0.008	< 0.003	0.004	0.035	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.73	0.70	0.70	0.62	0.62	0.63
Selenium (dissolved)	µg/L	10	63	0.13	0.10	0.14	0.29	1.04	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.49	0.43	0.41	0.56	0.45	< 0.50

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Zinc (dissolved)	µg/L	-	1,100	4.5	2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.11	6.98	7.11	7.06	7.18	7.44
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 144: Highland Drive Groundwater Well PH-93-10-II

PH-93-10-II									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.55	0.55	0.60	0.60	0.75	< 1.0
Cobalt (dissolved)	µg/L	-	66	2.71	3.13	3.17	2.83	3.24	3.70
Copper (dissolved)	µg/L	1,000	87	7.45	7.65	6.75	5.75	5.35	6.7
Lead (dissolved)	µg/L	10	25	0.02	0.06	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	6.95	8.70	8.20	7.35	7.95	8.8
Uranium (dissolved)	µg/L	20	420	4,970	6,650	5,635	6,955	7,705	7,800
Radium-226	Bq/L	0.49	-	0.02	< 0.02	0.02	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	0.03	0.04
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	167.5	207.0	183.0	180.0	180.5	190.0
Beryllium (dissolved)	µg/L	-	67	< 0.007	< 0.007	0.008	0.019	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	3290	3980	3265	2840	2850	3000
Cadmium (dissolved)	µg/L	5	2.7	0.005	0.004	0.005	0.032	0.047	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.17	0.21	0.16	0.19	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.52	0.29	0.29	0.44	1.10	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.87	0.74	0.71	0.78	0.68	0.72

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	6.99	6.88	6.98	7.06	7.07	7.27

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 145: Highland Drive Groundwater Well PH-93-12-II

PH-93-12-II									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	Decommissioned	
Arsenic (dissolved)	µg/L	25	1,900	0.30	1.10	0.30	0.30		
Cobalt (dissolved)	µg/L	-	66	0.77	0.80	0.65	0.79		
Copper (dissolved)	µg/L	1,000	87	3.35	1.70	1.70	2.05		
Lead (dissolved)	µg/L	10	25	0.09	0.46	< 0.09	< 0.09		
Nickel (dissolved)	µg/L	-	490	2.35	2.60	2.10	2.45		
Uranium (dissolved)	µg/L	20	420	3,330.0	3,680.0	2,970.0	3,975.0		
Radium-226	Bq/L	0.49	-	0.01	0.02	< 0.02	0.02		
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02		
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02		
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	192.5	214.0	178.5	191.5		
Beryllium (dissolved)	µg/L	-	67	0.008	< 0.007	< 0.007	< 0.007		
Boron (dissolved)	µg/L	5,000	45,000	779	729	840	1020		
Cadmium (dissolved)	µg/L	5	2.7	0.012	0.017	< 0.003	0.003		
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01		
Molybdenum (dissolved)	µg/L	-	9,200	0.15	0.27	0.14	0.07		
Selenium (dissolved)	µg/L	10	63	0.18	0.33	0.27	0.26		
Silver (dissolved)	µg/L	-	1.5	< 0.05	0.28	< 0.05	< 0.05		
Vanadium (dissolved)	µg/L	-	250	0.61	0.47	0.44	0.43		
Zinc (dissolved)	µg/L	-	1,100	7.5	13.0	< 2.0	< 2.0		

Additional Parameters									
pH	-	-	-	7.07	7.05	7.13	6.95		
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit; - – .</p>									

Table 146: Highland Drive Groundwater Well PH-95-17-I

PH-95-17-I									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	0.40	0.55	0.60	1.30	0.70	< 1.0
Cobalt (dissolved)	µg/L	-	66	3.95	4.48	5.86	5.35	3.98	4.20
Copper (dissolved)	µg/L	1,000	87	2.50	2.75	2.60	3.65	2.35	2.7
Lead (dissolved)	µg/L	10	25	< 0.01	< 0.06	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	4.65	5.35	6.30	6.45	4.75	4.9
Uranium (dissolved)	µg/L	20	420	9,735	12,500	12,950	11,450	6,770	7,940
Radium-226	Bq/L	0.49	-	0.03	0.03	0.03	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	191.0	233.0	265.5	257.0	229.5	230.0
Beryllium (dissolved)	µg/L	-	67	0.011	0.020	0.019	0.009	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	1340	1630	2765	2890	1075	1170
Cadmium (dissolved)	µg/L	5	2.7	0.009	0.035	0.029	0.005	0.052	< 0.090
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.51	0.64	0.94	0.82	0.80	1.10
Selenium (dissolved)	µg/L	10	63	0.25	0.38	2.32	3.30	1.10	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	0.50	0.62	0.61	0.80	0.68	0.76

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Zinc (dissolved)	µg/L	-	1,100	5.0	6.0	2.0	2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.15	7.04	6.85	7.01	7.10	7.36

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 147: Highland Drive Groundwater Well PH-95-17-II

PH-95-17-II									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum
Primary COPC									
Antimony (dissolved)	µg/L	6	20,000	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (dissolved)	µg/L	25	1,900	2.35	1.55	1.00	2.05	1.10	1.20
Cobalt (dissolved)	µg/L	-	66	4.90	3.37	1.65	2.92	2.01	2.50
Copper (dissolved)	µg/L	1,000	87	1.30	1.05	1.85	2.45	1.50	2.0
Lead (dissolved)	µg/L	10	25	< 0.01	0.05	< 0.09	< 0.09	0.30	< 0.50
Nickel (dissolved)	µg/L	-	490	4.85	1.85	1.10	2.85	2.25	2.8
Uranium (dissolved)	µg/L	20	420	98.90	4.61	3.88	4.37	3.31	4.30
Radium-226	Bq/L	0.49	-	0.02	0.02	< 0.01	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (dissolved)	µg/L	1,000	29,000	192.0	137.0	86.0	118.8	123.1	150.0
Beryllium (dissolved)	µg/L	-	67	0.009	< 0.007	0.010	< 0.007	0.204	< 0.40
Boron (dissolved)	µg/L	5,000	45,000	1150	648	414	1193	781	1,000
Cadmium (dissolved)	µg/L	5	2.7	0.008	0.007	0.026	0.008	0.049	< 0.090
Mercury (dissolved)	µg/L	1	0.29	0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (dissolved)	µg/L	-	9,200	0.18	0.58	0.11	0.11	0.45	< 0.50
Selenium (dissolved)	µg/L	10	63	0.19	0.21	0.55	0.44	1.14	< 2.0
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (dissolved)	µg/L	-	250	1.09	1.00	0.75	0.82	0.61	0.72

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	< 2.0	3.5	< 5.0
Additional Parameters									
pH	-	-	-	7.19	7.37	7.35	7.22	7.39	7.63
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 148: Highland Drive Groundwater Well PH-M-19

		PH-M-19								
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024		
		Table A2.5 [20]	Table 3 [16]	Average				Average	Maximum	
Primary COPC										
Antimony (dissolved)	µg/L	6	20,000	2.70	3.70	3.50	3.80	Decommissioned		
Arsenic (dissolved)	µg/L	25	1,900	379.0	354.5	331.5	335.0			
Cobalt (dissolved)	µg/L	-	66	0.11	0.12	0.11	0.24			
Copper (dissolved)	µg/L	1,000	87	0.55	0.45	0.45	0.50			
Lead (dissolved)	µg/L	10	25	0.03	0.05	0.09	< 0.09			
Nickel (dissolved)	µg/L	-	490	0.30	0.15	0.20	0.30			
Uranium (dissolved)	µg/L	20	420	187.0	203.5	158.0	220.0			
Radium-226	Bq/L	0.49	-	< 0.01	< 0.01	< 0.01	0.01			
Thorium-230	Bq/L	0.65	-	< 0.02	< 0.02	< 0.02	< 0.02			
Thorium-232	Bq/L	0.60	-	< 0.02	< 0.02	< 0.02	< 0.02			
Secondary COPC										
Barium (dissolved)	µg/L	1,000	29,000	48.2	56.5	45.6	40.3			
Beryllium (dissolved)	µg/L	-	67	0.017	< 0.007	< 0.007	< 0.007			
Boron (dissolved)	µg/L	5,000	45,000	33	27	68	25			
Cadmium (dissolved)	µg/L	5	2.7	0.004	0.007	0.005	0.005			
Mercury (dissolved)	µg/L	1	0.29	< 0.01	< 0.01	0.01	< 0.01			
Molybdenum (dissolved)	µg/L	-	9,200	0.91	0.86	0.88	1.03			
Selenium (dissolved)	µg/L	10	63	1.48	1.40	1.09	1.87			
Silver (dissolved)	µg/L	-	1.5	< 0.05	< 0.05	< 0.05	< 0.05			
Vanadium (dissolved)	µg/L	-	250	5.19	5.38	4.23	3.18			

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Zinc (dissolved)	µg/L	-	1,100	< 2.0	< 2.0	< 2.0	2.5		
Additional Parameters									
pH	-	-	-	7.57	7.48	7.61	7.63		

Notes:

2024 averages are based on semi-annual (2) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 149: Highland Drive Groundwater Levels

Well ID	2020	2021	2022	2023	2024		
	Average				Average	Minimum	Maximum
	(mASL)				(mASL)		
PH-02-01	104.13	103.89	103.96	103.77	103.97	103.82	104.16
PH-02-02	104.11	103.88	103.99	104	103.97	103.81	104.16
PH-02-03	104.11	103.9	103.96	104	103.98	103.82	104.13
PH-90-3-I	110.19	109.89	109.82	109.85	109.77	109.62	109.83
PH-90-3-II	120.19	119.45	118.79	119.28	119.04	118.92	119.19
PH-90-4-W	107.77	107.57	107.43	107.01	107.3	107.09	107.5
PH-90-4-I	106.43	106.16	128.18	-	-	-	-
PH-90-4-II	-	-	-	-	-	-	-
PH-90-4-III	115.47	115.16	115.08	115.32	115.28	115.25	115.34
PH-90-6-I	107.3	107.06	106.71	-	-	-	-
PH-90-6-II	109.94	112.54	107.53	-	-	-	-
PH-90-6-III	115.88	116.44	115.59	-	-	-	-
PH-90-7-I	105.01	104.54	104.59	104.77	105.05	104.51	106.08
PH-90-7-II	105.36	105.12	105.07	105.04	105.16	105.03	105.32
PH-90-7-III	112.57	112.17	111.97	112.45	112.22	111.85	112.58
PH-90-8-I	103.99	103.88	103.87	103.91	104.43	103.8	105.92
PH-90-8-II	104.09	103.93	103.92	103.97	103.96	103.83	104.13
PH-90-9-I	-	-	-	-	-	-	-
PH-90-9-II	94.77	90.4	90.25	-	-	-	-
PH-90-9-III	96.85	96.18	95.92	95.73	95.71	94.85	96.93
PH-93-3-I	106.09	106.21	105.74	105.89	105.56	106.74	105.99
PH-93-3-II	106.09	106.06	105.7	105.83	105.74	105.56	105.96
PH-93-3-III	112.58	112.5	112.1	112.5	112.28	112.07	112.53
PH-93-6-I	-	-	-	-	-	-	-
PH-93-6-II	-	-	-	-	-	-	-
PH-93-6-III	-	-	-	-	-	-	-
PH-93-9-I	-	-	-	-	-	-	-
PH-93-9-II	-	-	-	-	-	-	-
PH-93-10-I	105.5	105.48	105.15	105.31	105.16	104.9	105.44
PH-93-10-II	105.5	105.49	105.14	105.32	105.19	104.94	105.44
PH-93-10-III A	-	-	-	-	-	-	-
PH-93-10-III B	110.15	110.19	110	110.21	110.07	109.98	110.17

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Well ID	2020	2021	2022	2023	2024		
	Average				Average	Minimum	Maximum
	(mASL)				(mASL)		
PH-93-12-I	-	-	-	-	-	-	-
PH-93-12-II	-	-	-	-	-	-	-
PH-93-12-III	-	-	-	-	-	-	-
PH-95-I	105.53	105.49	106.33	-	-	-	-
PH-95-7	-	-	-	-	-	-	-
PH-95-17-I	106.13	106.09	105.77	105.98	105.76	105.6	105.97
PH-95-17-II	113	113	112.61	112.96	112.73	112.55	112.93
PH-95-18	106.16	106.22	-	-	-	-	-
PH-M19	100.17	100.16	100.12	100.43	-	-	-

Notes:
Annual averages are based on quarterly (4) samples per year.
The following wells have been decommissioned, PH-90-6-I, PH-90-6-II, PH-90-6-III, PH-95-I, PH-M-19.
mASL – metres above sea level; - – indicates no data are available (e.g., well damaged, not located, or dry or decommissioned).

**Table 150: Port Granby Long-Term Waste Management Facility Soil Monitoring –
Location 1 (PG-LTWMF-SS-01)**

PG-LTWMF-SS-01						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	1.40	1.70	1.60	1.60	1.80
Cobalt	µg/g	2.3	2.1	2.3	2.1	2.1
Copper	µg/g	4.6	4.4	4.5	4.4	4.4
Lead	µg/g	7.4	7.0	7.6	7.3	7.7
Nickel	µg/g	4.90	4.30	4.70	4.00	4.50
Uranium	µg/g	0.70	0.78	0.66	0.65	1.20
Radium-226	Bq/g	0.05	< 0.05	< 0.04	< 0.05	0.07
Thorium-230	Bq/g	0.05	< 0.30	< 0.30	< 0.20	< 0.20
Thorium-232	Bq/g	0.01	0.01	0.01	0.01	0.02
Secondary COPC						
Barium	µg/g	24.0	26.0	25.0	23.0	25.0
Beryllium	µg/g	0.230	0.230	0.240	0.230	0.300
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	1.00
Cadmium	µg/g	0.23	0.19	0.22	0.20	0.22
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	µg/g	0.20	0.20	0.20	1.30	1.00
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.20	0.30
Silver	µg/g	0.06	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium	µg/g	18	16	19	17	17
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 151: Port Granby Long-Term Waste Management Facility Soil Monitoring – Location 2
(PG-LTWmf-SS-02)**

PG-LTWmf-SS-02						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	2.30	2.90	2.90	2.50	3.00
Cobalt	µg/g	4.3	3.8	4.6	4.0	3.7
Copper	µg/g	9.2	8.3	9.1	8.1	7.6
Lead	µg/g	11.0	12.0	13.0	10.0	9.2
Nickel	µg/g	8.60	7.30	8.90	7.10	7.60
Uranium	µg/g	0.44	0.53	0.48	0.60	0.48
Radium-226	Bq/g	0.06	0.06	< 0.05	0.06	0.08
Thorium-230	Bq/g	0.08	0.20	< 0.10	< 0.20	< 0.20
Thorium-232	Bq/g	0.01	0.01	0.01	0.01	0.02
Secondary COPC						
Barium	µg/g	54.0	55.0	62.0	52.0	53.0
Beryllium	µg/g	0.320	0.310	0.340	0.310	0.380
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	µg/g	0.24	0.22	0.23	0.18	0.17
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	µg/g	0.20	0.20	0.20	0.20	0.20
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.20	0.30
Silver	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium	µg/g	20	19	22	19	20
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 152: Port Granby Long-Term Waste Management Facility Soil Monitoring – Location 3
(PG-LTWmf-SS-03)**

PG-LTWmf-SS-03						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	1.70	2.10	2.30	2.30	2.70
Cobalt	µg/g	3.2	2.8	3.8	3.6	3.5
Copper	µg/g	9.2	8.6	11.0	10.0	10.0
Lead	µg/g	17.0	20.0	23.0	26.0	25.0
Nickel	µg/g	6.10	5.30	7.30	6.20	6.70
Uranium	µg/g	0.60	0.59	0.67	0.69	0.82
Radium-226	Bq/g	0.05	< 0.03	0.07	< 0.05	0.08
Thorium-230	Bq/g	0.06	< 0.20	< 0.30	< 0.30	< 0.20
Thorium-232	Bq/g	0.01	0.01	0.01	0.01	0.02
Secondary COPC						
Barium	µg/g	42.0	44.0	53.0	50.0	52.0
Beryllium	µg/g	0.260	0.250	0.320	0.290	0.370
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	µg/g	0.28	0.25	0.30	0.25	0.30
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Molybdenum	µg/g	0.30	0.30	0.40	0.80	0.70
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.20	0.40
Silver	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium	µg/g	17	16	20	18	19
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 153: Port Granby Long-Term Waste Management Facility Soil Monitoring – Location 4
(PG-LTWmf-SS-04)**

PG-LTWmf-SS-04						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	1.70	2.10	2.10	2.30	2.00
Cobalt	µg/g	2.5	2.4	3.0	2.6	2.4
Copper	µg/g	5.1	5.5	5.8	6.0	5.1
Lead	µg/g	10.0	11.0	12.0	11.0	10.0
Nickel	µg/g	4.60	4.30	5.20	4.40	4.20
Uranium	µg/g	0.61	0.66	0.62	0.88	0.64
Radium-226	Bq/g	0.06	0.06	< 0.06	< 0.06	0.08
Thorium-230	Bq/g	0.08	< 0.10	< 0.40	< 0.30	< 0.20
Thorium-232	Bq/g	0.01	0.01	0.01	0.01	0.02
Secondary COPC						
Barium	µg/g	28.0	32.0	34.0	32.0	29.0
Beryllium	µg/g	0.210	0.230	0.260	0.240	0.270
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	µg/g	0.19	0.19	0.20	0.18	0.18
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Molybdenum	µg/g	0.20	0.20	0.30	0.20	0.30
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.20	0.20
Silver	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium	µg/g	14	13	17	13	13
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 154: Port Granby Long-Term Waste Management Facility Soil Monitoring – Location 5
(PG-LTWmf-SS-05)**

PG-LTWmf-SS-05						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	4.70	4.90	5.10	4.80	4.60
Cobalt	µg/g	3.7	3.0	3.6	2.9	3.0
Copper	µg/g	5.8	4.7	5.6	4.6	5.8
Lead	µg/g	12.0	10.0	12.0	9.9	10.0
Nickel	µg/g	5.70	4.70	5.70	4.20	4.90
Uranium	µg/g	0.80	0.80	0.79	0.81	0.74
Radium-226	Bq/g	0.06	0.06	0.14	< 0.07	0.13
Thorium-230	Bq/g	0.08	0.40	< 0.40	< 0.40	< 0.60
Thorium-232	Bq/g	0.02	0.02	0.02	0.01	0.02
Secondary COPC						
Barium	µg/g	27.0	23.0	28.0	19.0	25.0
Beryllium	µg/g	0.200	0.180	0.210	0.170	0.230
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	µg/g	0.17	0.15	0.18	0.12	0.20
Mercury	µg/g	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Molybdenum	µg/g	0.20	0.10	0.20	0.20	0.20
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.10	0.20
Silver	µg/g	0.08	0.06	0.07	< 0.05	0.06
Vanadium	µg/g	14	13	16	13	13
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

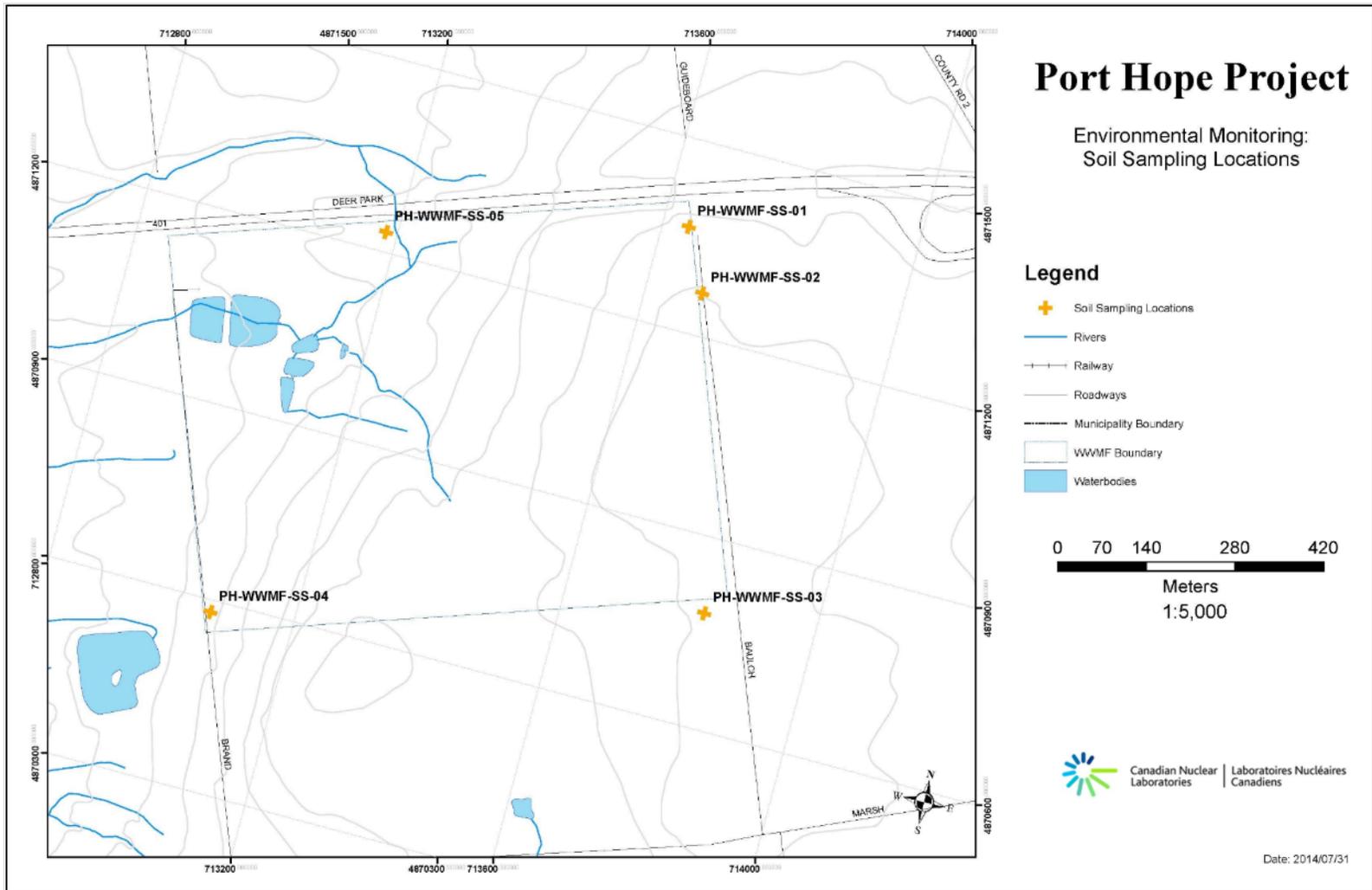


Figure 24: Port Hope Long-Term Waste Management Facility Soil Sampling Locations

**Table 155: Port Hope Long-Term Waste Management Facility Soil Monitoring
– Location 1 (PH-WWMF-SS-01)**

PH-WWMF-SS-01						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				Average
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	4.80	5.30	4.60	6.50	7.40
Cobalt	µg/g	8.2	6.6	7.4	6.6	7.8
Copper	µg/g	18.0	12.0	13.0	13.0	13.0
Lead	µg/g	23.0	21.0	22.0	25.0	34.0
Nickel	µg/g	12.00	9.00	10.00	8.80	0.50
Uranium	µg/g	4.10	4.00	4.10	4.30	3.80
Radium-226	Bq/g	0.10	0.19	< 0.09	0.20	0.22
Thorium-230	Bq/g	< 0.40	< 0.40	< 0.40	< 0.30	< 0.30
Thorium-232	Bq/g	0.02	0.02	0.02	0.02	0.10
Secondary COPC						
Barium	µg/g	66.0	55.0	62.0	51.0	57.0
Beryllium	µg/g	0.400	0.370	0.410	0.380	0.450
Boron (water soluble)	µg/g	< 0.50	< 0.50	1.40	< 0.50	0.06
Cadmium	µg/g	0.49	0.42	0.99	0.77	0.73
Mercury	µg/g	0.06	0.05	0.06	0.05	< 0.50
Molybdenum	µg/g	0.60	0.40	0.50	0.40	10.00
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.40	0.40
Silver	µg/g	0.47	0.48	0.52	0.64	0.55
Vanadium	µg/g	23	19	23	18	16
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 156: Port Hope Long-Term Waste Management Facility Soil Monitoring
– Location 2 (PH-WWMF-SS-02)**

PH-WWMF-SS-02						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	3.50	3.70	3.20	4.00	3.50
Cobalt	µg/g	4.9	4.1	4.9	4.2	3.5
Copper	µg/g	7.9	7.0	7.9	10.0	4.7
Lead	µg/g	17.0	16.0	16.0	18.0	13.0
Nickel	µg/g	7.00	5.70	6.50	6.20	0.20
Uranium	µg/g	1.40	1.20	1.20	3.40	0.87
Radium-226	Bq/g	0.13	0.12	< 0.07	< 0.06	< 0.02
Thorium-230	Bq/g	< 0.08	< 0.30	< 0.30	< 0.30	< 0.20
Thorium-232	Bq/g	0.01	0.01	0.01	0.02	0.02
Secondary COPC						
Barium	µg/g	40.0	38.0	42.0	44.0	31.0
Beryllium	µg/g	0.260	0.250	0.280	0.300	0.260
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05
Cadmium	µg/g	0.26	0.23	0.24	0.26	0.19
Mercury	µg/g	0.05	< 0.05	< 0.05	0.06	< 0.50
Molybdenum	µg/g	0.30	0.30	0.30	0.30	5.00
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.30	0.30
Silver	µg/g	0.15	0.15	0.15	0.41	0.05
Vanadium	µg/g	19	14	20	15	13
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 157: Port Hope Long-Term Waste Management Facility Soil Monitoring
– Location 3 (PH-WWMF-SS-03)**

PH-WWMF-SS-03						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	3.40	3.70	2.90	4.10	3.50
Cobalt	µg/g	7.5	6.2	5.8	5.7	5.2
Copper	µg/g	14.0	12.0	11.0	11.0	9.8
Lead	µg/g	12.0	11.0	10.0	11.0	11.0
Nickel	µg/g	14.00	11.00	9.90	10.00	0.30
Uranium	µg/g	1.40	1.20	1.10	1.40	1.30
Radium-226	Bq/g	0.08	< 0.05	0.20	< 0.05	0.06
Thorium-230	Bq/g	< 0.20	< 0.20	< 0.30	< 0.40	< 0.20
Thorium-232	Bq/g	0.02	0.02	0.02	0.02	0.03
Secondary COPC						
Barium	µg/g	100.0	94.0	77.0	85.0	83.0
Beryllium	µg/g	0.500	0.440	0.390	0.450	0.470
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05
Cadmium	µg/g	0.28	0.21	0.19	0.23	0.22
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50
Molybdenum	µg/g	0.40	0.30	0.30	0.30	9.70
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.40	0.40
Silver	µg/g	0.08	0.06	0.05	0.07	< 0.05
Vanadium	µg/g	35	28	27	24	24
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 158: Port Hope Long-Term Waste Management Facility Soil Monitoring
– Location 4 (PH-WWMF-SS-04)**

PH-WWMF-SS-04						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	2.50	2.90	2.40	2.70	3.60
Cobalt	µg/g	3.0	2.8	2.7	2.2	2.0
Copper	µg/g	6.7	5.8	5.5	4.3	4.0
Lead	µg/g	11.0	19.0	12.0	11.0	7.6
Nickel	µg/g	5.10	4.50	4.40	3.70	0.20
Uranium	µg/g	0.67	0.64	0.54	0.61	0.52
Radium-226	Bq/g	< 0.04	0.09	< 0.05	< 0.04	0.04
Thorium-230	Bq/g	< 0.30	< 0.30	< 0.20	< 0.30	< 0.20
Thorium-232	Bq/g	0.01	0.01	0.01	0.01	0.04
Secondary COPC						
Barium	µg/g	28.0	36.0	22.0	22.0	25.0
Beryllium	µg/g	0.220	0.230	0.210	0.200	0.190
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05
Cadmium	µg/g	0.21	0.26	0.22	0.15	0.20
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50
Molybdenum	µg/g	0.30	0.20	0.30	0.20	3.50
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.30	0.20
Silver	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium	µg/g	15	11	13	11	9
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

**Table 159: Port Hope Long-Term Waste Management Facility Soil Monitoring
– Location 5 (PH-WWMF-SS-05)**

PH-WWMF-SS-05						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				Average
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	No sample
Arsenic	µg/g	2.00	19.00	20.00	27.00	
Cobalt	µg/g	6.3	4.4	4.3	4.3	
Copper	µg/g	14.0	9.7	9.6	10.0	
Lead	µg/g	34.0	21.0	20.0	19.0	
Nickel	µg/g	12.00	8.60	8.30	8.10	
Uranium	µg/g	0.60	7.50	6.20	8.50	
Radium-226	Bq/g	0.09	0.13	< 0.06	< 0.04	
Thorium-230	Bq/g	< 0.20	< 0.20	< 0.30	< 0.30	
Thorium-232	Bq/g	0.02	0.02	0.01	0.02	
Secondary COPC						
Barium	µg/g	81.0	78.0	62.0	69.0	
Beryllium	µg/g	0.410	0.320	0.280	0.330	
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	
Cadmium	µg/g	0.26	0.17	0.18	0.17	
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	
Molybdenum	µg/g	0.40	0.30	0.40	0.30	
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.40	
Silver	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	
Vanadium	µg/g	29	21	21	20	
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

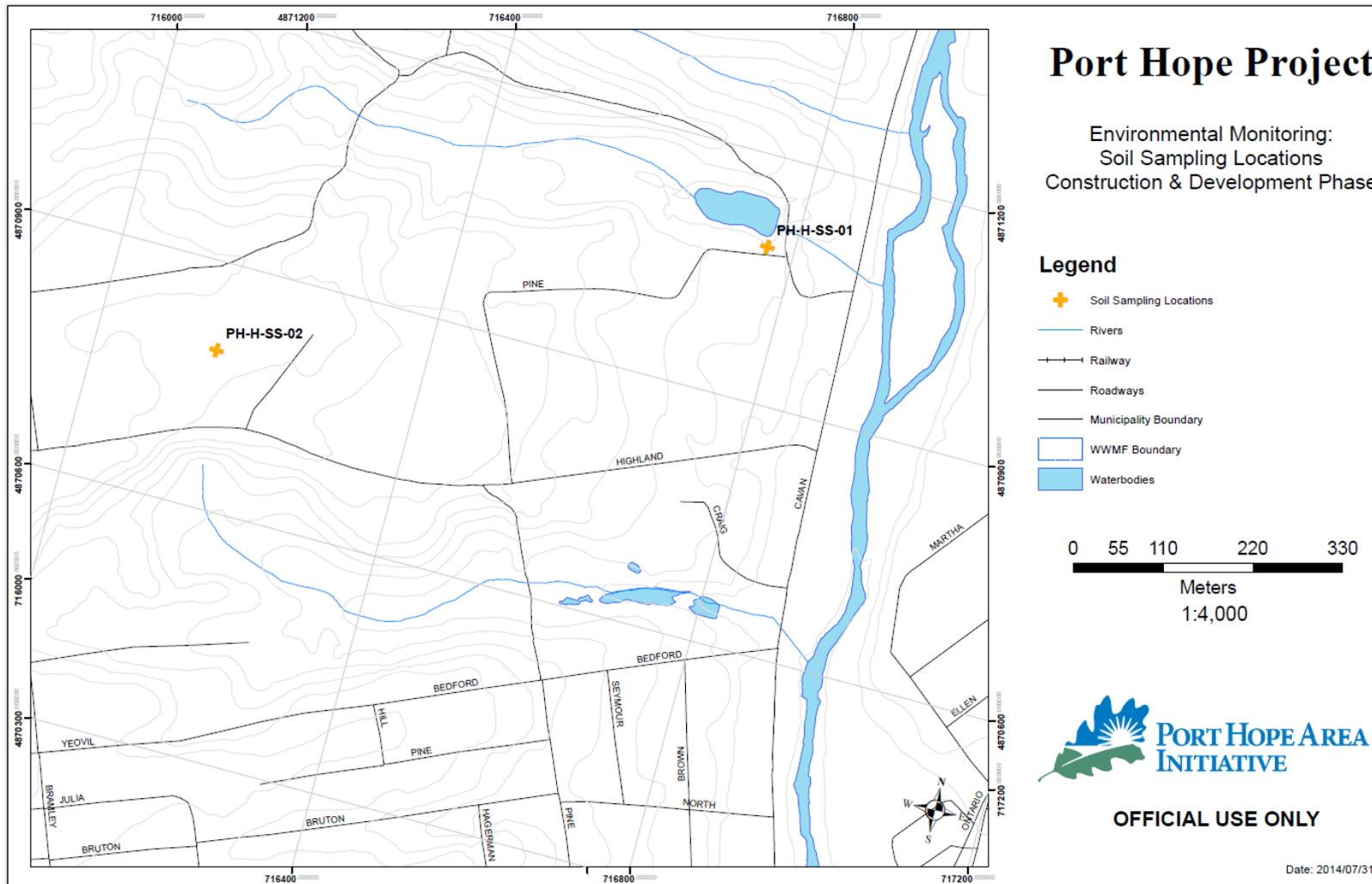


Figure 25: Port Hope Project Highland Drive Landfill Soil Sampling Locations

Table 160: Highland Drive Soil Monitoring – Location 1 (PH-H-SS-01)

PH-H-SS-01						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	2.4	2.2	1.9	3.5	2.9
Cobalt	µg/g	8.9	6.0	6.5	6.5	5.4
Copper	µg/g	19.0	13.0	13.0	16.0	11.0
Lead	µg/g	14.0	8.9	9.3	14.0	13.0
Nickel	µg/g	18.0	12.0	12.0	13.0	11.0
Uranium	µg/g	0.89	0.60	0.57	0.73	0.69
Radium-226	Bq/g	0.08	< 0.04	0.09	< 0.04	< 0.02
Thorium-230	Bq/g	0.07	< 0.30	< 0.30	< 0.20	< 0.20
Thorium-232	Bq/g	0.02	0.02	0.02	0.02	0.04
Secondary COPC						
Barium	µg/g	140.0	95.0	95.0	110.0	87.0
Beryllium	µg/g	0.500	0.380	0.410	0.510	0.430
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	µg/g	0.22	0.15	0.18	0.19	0.17
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	µg/g	0.40	0.30	0.40	0.40	0.30
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.50	0.40
Silver	µg/g	0.07	0.06	0.07	0.05	0.05
Vanadium	µg/g	44	29	33	30	26
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

Table 161: Highland Drive Soil Monitoring – Location 2 (PH-H-SS-02)

PH-H-SS-02						
Parameter	Unit of Measure	2020	2021	2022	2023	2024
		Average				
Primary COPC						
Antimony	µg/g	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Arsenic	µg/g	4.2	4.0	2.9	4.4	4.0
Cobalt	µg/g	6.5	6.4	6.6	5.9	5.5
Copper	µg/g	15.0	15.0	16.0	14.0	14.0
Lead	µg/g	19.0	16.0	15.0	15.0	15.0
Nickel	µg/g	13.0	12.0	12.0	11.0	11.0
Uranium	µg/g	1.70	2.30	2.30	2.50	3.30
Radium-226	Bq/g	< 0.03	< 0.04	0.20	0.10	0.07
Thorium-230	Bq/g	0.10	< 0.30	< 0.40	< 0.30	< 0.30
Thorium-232	Bq/g	0.01	0.02	0.02	0.02	0.04
Secondary COPC						
Barium	µg/g	95.0	108.0	100.0	100.0	95.0
Beryllium	µg/g	0.380	0.420	0.380	0.450	0.430
Boron (water soluble)	µg/g	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	µg/g	0.19	0.19	0.17	0.19	0.19
Mercury	µg/g	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	µg/g	0.40	0.30	0.40	0.40	0.30
Selenium	µg/g	< 0.70	< 0.70	< 0.70	0.40	0.30
Silver	µg/g	0.10	0.12	0.15	0.11	0.14
Vanadium	µg/g	31	30	32	27	26
Notes:						
2024 averages are based on annual (1) sampling results.						
< – indicates the result was less than the laboratory method detection limit.						

C.3 Aquatic Environmental Monitoring

Table 162: Port Granby Project Surface Water Quality – Port Granby Creek (PGC-D)

PGC-D									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.80	< 0.90
Arsenic (total)	µg/L	100	5	0.50	1.65	0.60	0.55	0.70	< 1.0
Cobalt (total)	µg/L	0.90	-	0.08	0.17	0.09	0.12	0.20	< 0.50
Copper (total)	µg/L	5	-	0.60	0.68	0.68	0.70	0.98	< 1.0
Lead (total)	µg/L	5	7	0.08	0.12	0.11	0.23	0.24	< 0.50
Nickel (total)	µg/L	25	25	0.25	3.63	0.38	0.38	0.53	< 1.0
Uranium (total)	µg/L	5	15	0.789	0.884	0.862	0.812	0.891	0.937
Radium-226	Bq/L	1	-	0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	55.1	57.5	59.5	54.4	61.9	71.0
Beryllium (total)	µg/L	1,100	-	0.008	0.021	0.011	0.011	0.106	< 0.40
Boron (total)	µg/L	200	1,500	12	13	15	14	13	16
Cadmium (total)	µg/L	0.20	0.09	0.005	0.014	0.007	0.007	0.027	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.03	< 0.10
Molybdenum (total)	µg/L	40	73	0.46	0.84	0.52	0.50	0.53	< 0.60
Selenium (total)	µg/L	100	1	0.13	0.25	0.21	0.14	0.62	< 2.0

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Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.76	0.93	0.77	1.00	1.10	1.41
Zinc (total)	µg/L	30	30	< 2.0	2.0	< 2.0	< 2.0	2.8	< 5.0

Notes:

2024 averages are based on quarterly (4) sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit.

Table 163: Port Granby Project Surface Water Quality – Port Granby Creek (PGC-U)

PGC-U									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.50	0.80	< 0.90
Arsenic (total)	µg/L	100	5	0.30	0.70	0.80	< 1.00	0.70	< 1.0
Cobalt (total)	µg/L	0.90	-	0.10	0.11	0.12	< 0.50	0.21	< 0.50
Copper (total)	µg/L	5	-	< 1.0	< 1.0	< 1.0	< 0.90	0.98	< 1.0
Lead (total)	µg/L	5	7	0.29	0.11	0.19	< 0.50	0.27	< 0.50
Nickel (total)	µg/L	25	25	0.30	0.40	0.40	< 1.00	0.53	< 1.0
Uranium (total)	µg/L	5	15	0.884	0.885	0.929	0.770	0.867	0.929
Radium-226	Bq/L	1	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.01	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	56.0	60.5	61.8	58.4	60.6	69.0
Beryllium (total)	µg/L	1,100	-	0.010	0.021	0.009	0.014	0.108	< 0.40
Boron (total)	µg/L	200	1,500	13	12	15	13	13	17
Cadmium (total)	µg/L	0.20	0.09	0.012	0.010	0.013	0.012	0.029	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.03	< 0.10
Molybdenum (total)	µg/L	40	73	0.45	0.61	0.53	0.54	0.55	< 0.7
Selenium (total)	µg/L	100	1	0.14	0.31	0.20	0.15	0.63	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.92	1.07	1.01	1.28	1.11	1.71

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Zinc (total)	µg/L	30	30	3.8	2.5	< 2.0	2.8	2.8	< 5
<p>Notes: 2024 averages are based on quarterly (4) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit.</p>									

Table 164: Port Granby Project Storm Event Sampling – Port Granby Creek (PGC-D)

PGC-D									
Parameter	Unit of Measure	Criteria		2024/04/03 10:30AM	2024/04/03 11:30AM	2024/04/03 12:30PM	2024/04/03 1:30PM	2024/04/03 2:30PM	2024/04/03 3:30PM
		PWQO [13]	CWQG [15]						
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	0.50	0.40	0.40	0.50	0.70	1.30
Cobalt (total)	µg/L	0.90	-	0.08	0.08	0.08	0.11	0.34	0.98
Copper (total)	µg/L	5	-	< 1.00	< 1.00	< 1.00	< 1.00	1.00	2.0
Lead (total)	µg/L	5	7	0.14	0.16	0.19	0.25	0.81	2.46
Nickel (total)	µg/L	25	25	0.30	0.30	0.30	0.40	0.80	2.1
Uranium (total)	µg/L	5	15	0.951	0.939	0.911	0.933	0.976	1.160
Radium-226	Bq/L	1	-	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	47.9	46.6	47.5	48.3	54.7	68.7
Beryllium (total)	µg/L	1,100	-	< 0.007	0.011	< 0.007	< 0.007	0.020	0.09

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Boron (total)	µg/L	200	1,500	7	7	7	7	7	8
Cadmium (total)	µg/L	0.20	0.09	0.008	0.004	0.006	0.011	0.030	0.095
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	< 0.40	0.50	0.50	0.40	< 0.40	0.50
Selenium (total)	µg/L	100	1	0.12	0.12	0.13	0.13	0.17	0.3
Silver (total)	µg/L	0.10	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.60	0.57	0.60	0.76	1.83	4.95
Zinc (total)	µg/L	30	30	< 2.0	< 2.0	< 2.0	< 2.0	5.0	11.0
Additional Parameters									
Staff Gauge	cm	-	-	4	5	6	7	7	9
Total Suspended Solids	mg/L	-	-	9	7	15	25	58	208

Notes:

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit.

Table 165: Port Granby Project Surface Water Quality –Lake Ontario Diffuser (PG-LO-D)

PG-LO-D									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.85	0.83	0.93	0.77	0.87	< 1.0
Cobalt (total)	µg/L	0.90	-	0.02	0.02	0.02	0.02	0.18	< 0.50
Copper (total)	µg/L	5	-	0.85	0.73	0.83	0.77	0.97	< 1.0
Lead (total)	µg/L	5	7	0.03	< 0.09	< 0.09	< 0.09	0.23	< 0.50
Nickel (total)	µg/L	25	25	0.40	0.63	0.50	0.60	0.70	< 1.0
Uranium (total)	µg/L	5	15	0.332	0.369	0.414	1.475	0.394	0.478
Radium-226	Bq/L	1	-	0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	23.1	20.7	22.6	22.5	21.8	22.0
Beryllium (total)	µg/L	1,100	-	0.013	< 0.007	0.007	< 0.007	0.138	< 0.40
Boron (total)	µg/L	200	1,500	21	24	23	33	21	21
Cadmium (total)	µg/L	0.20	0.09	< 0.003	0.004	0.005	0.004	0.033	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	0.02	< 0.01	0.04	< 0.10
Molybdenum (total)	µg/L	40	73	1.22	1.22	1.17	1.25	1.17	1.30
Selenium (total)	µg/L	100	1	0.14	0.14	0.11	0.16	0.75	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.21	0.23	0.21	0.21	0.29	< 0.50

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Zinc (total)	µg/L	30	30	2.5	< 2.0	< 2.0	3.0	3.0	< 5.0
<p>Notes: 2024 averages are based on 3 sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit.</p>									

Table 166: Port Granby Project Surface Water Quality – Lake Ontario Diffuser (PG-LO-E)

PG-LO-E									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.90	0.80	0.90	0.83	0.87	< 1.0
Cobalt (total)	µg/L	0.90	-	0.03	0.02	0.01	0.02	0.17	< 0.50
Copper (total)	µg/L	5	-	0.85	0.80	1.07	0.90	0.97	< 1.0
Lead (total)	µg/L	5	7	< 0.01	< 0.09	< 0.09	< 0.09	0.23	< 0.50
Nickel (total)	µg/L	25	25	0.40	0.53	0.57	0.53	0.63	< 1.0
Uranium (total)	µg/L	5	15	0.335	0.345	0.412	0.815	0.460	0.706
Radium-226	Bq/L	1	-	< 0.01	0.01	< 0.01	< 0.01	0.01	0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	24.3	22.5	22.2	22.3	21.2	22.0
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007	< 0.007	< 0.007	0.138	< 0.40
Boron (total)	µg/L	200	1,500	20	17	22	27	21	21
Cadmium (total)	µg/L	0.20	0.09	0.013	0.005	0.009	0.003	0.033	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.10
Molybdenum (total)	µg/L	40	73	1.23	1.14	1.21	1.23	1.23	1.60
Selenium (total)	µg/L	100	1	0.13	0.16	0.15	0.14	0.76	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.23	0.25	0.19	0.21	0.29	< 0.50

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Zinc (total)	µg/L	30	30	2.0	2.7	2.3	< 2.0	3.0	< 5.0
<p>Notes:</p> <p>2024 averages are based on 3 sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 167: Port Granby Project Surface Water Quality – Lake Ontario Diffuser (PG-LO-W)

PG-LO-W									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.85	0.87	0.80	0.77	0.90	< 1.0
Cobalt (total)	µg/L	0.90	-	0.02	0.03	0.02	0.01	0.18	< 0.50
Copper (total)	µg/L	5	-	0.85	0.93	1.20	0.80	0.97	< 1.0
Lead (total)	µg/L	5	7	0.01	0.09	< 0.09	< 0.09	0.23	< 0.50
Nickel (total)	µg/L	25	25	0.40	0.67	0.53	0.57	0.67	< 1.0
Uranium (total)	µg/L	5	15	0.325	0.350	0.396	0.992	0.504	0.723
Radium-226	Bq/L	1	-	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	24.4	22.2	22.7	22.3	21.5	22.0
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007	< 0.007	< 0.007	0.138	< 0.40
Boron (total)	µg/L	200	1,500	21	20	25	29	20	21
Cadmium (total)	µg/L	0.20	0.09	0.006	0.005	0.006	< 0.003	0.032	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.10
Molybdenum (total)	µg/L	40	73	1.26	1.41	1.12	1.25	1.17	1.40
Selenium (total)	µg/L	100	1	0.15	0.15	0.14	0.17	0.74	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.23	0.25	0.20	0.21	0.28	< 0.50

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Zinc (total)	µg/L	30	30	2.0	2.0	< 2.0	< 2.0	3.0	< 5.0
<p>Notes:</p> <p>2024 averages are based on 3 sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 168: Port Granby Long-Term Waste Management Facility Drainage Water Quality – (PG-SW-1/DP1-02)

PG-SW1/DP1-02									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.70	< 0.90
Arsenic (total)	µg/L	100	5	1.20	1.20	0.55	0.80	0.90	< 1.0
Cobalt (total)	µg/L	0.90	-	0.10	0.09	0.04	0.05	0.30	< 0.50
Copper (total)	µg/L	5	-	0.30	0.30	0.45	< 0.20	0.95	< 1.0
Lead (total)	µg/L	5	7	0.08	0.17	< 0.09	0.10	0.32	0.50
Nickel (total)	µg/L	25	25	0.15	< 0.10	0.10	0.15	0.70	< 1.0
Uranium (total)	µg/L	5	15	0.56	0.46	0.37	0.40	1.34	1.60
Radium-226	Bq/L	1	-	< 0.01	0.02	< 0.01	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	15.2	13.7	14.9	29.6	36.7	59.0
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007	< 0.007	< 0.007	0.204	< 0.40
Boron (total)	µg/L	200	1,500	10	7	9	11	18	22
Cadmium (total)	µg/L	0.20	0.09	0.004	0.003	0.004	0.004	0.050	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	0.02	< 0.01	< 0.01	< 0.06	< 0.10
Molybdenum (total)	µg/L	40	73	0.10	0.11	0.10	0.21	0.83	0.90
Selenium (total)	µg/L	100	1	0.05	0.05	0.06	0.08	< 1.0	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (total)	µg/L	6	-	0.17	0.14	0.06	0.15	0.78	0.93

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Zinc (total)	µg/L	30	30	2.5	< 2.0	2.5	< 2.0	5.0	< 5.0
<p>Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;</p>									

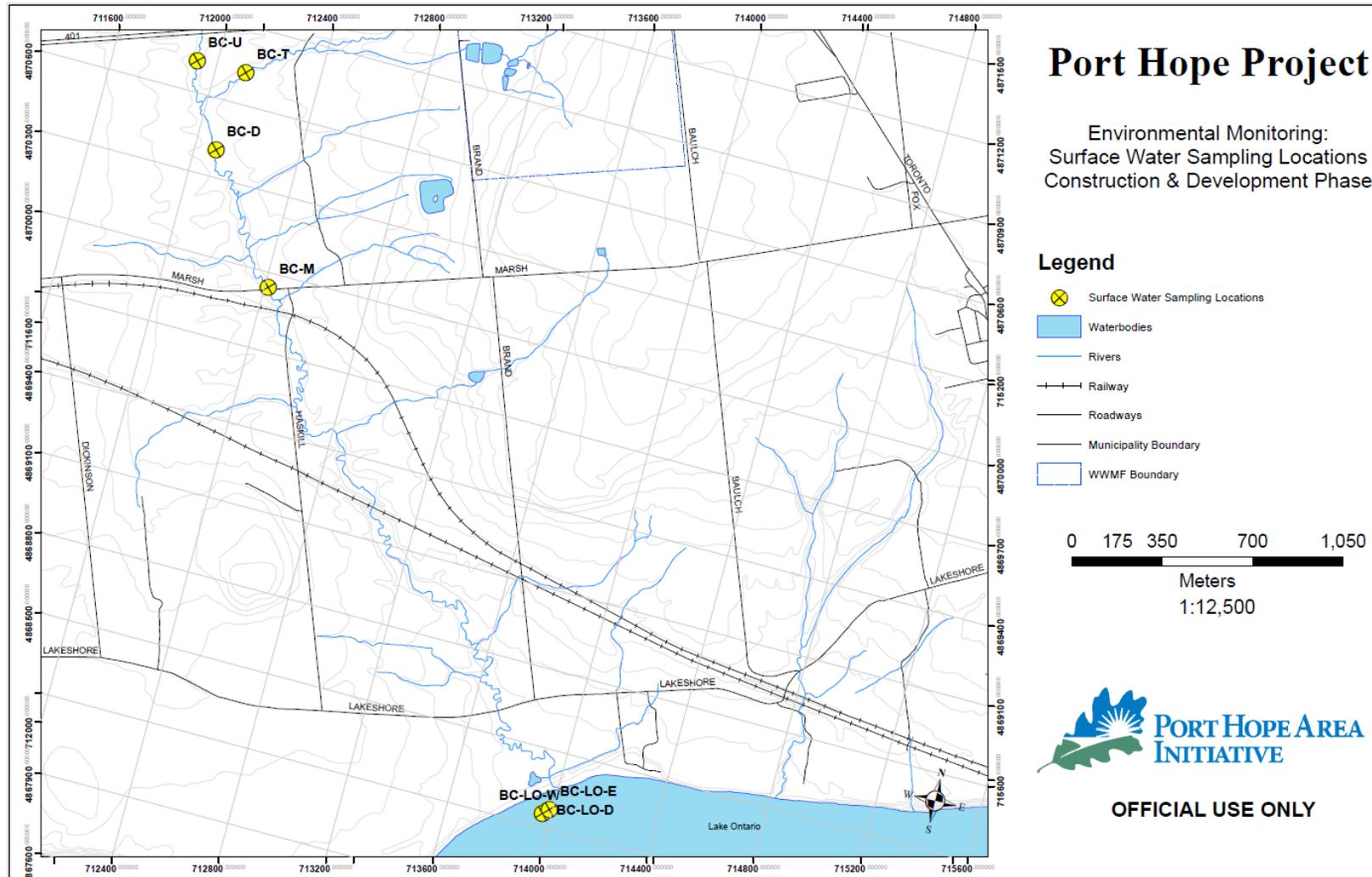


Figure 26: Port Hope Project Brand Creek and Lake Ontario Surface Water Sampling Locations

**Table 169: Port Hope Long-Term Waste Management Facility Surface Water Quality
– Brand Creek – Marsh Road (BC-M)**

BC-M									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	1.53	1.45	1.75	1.05	2.05	2.3
Cobalt (total)	µg/L	0.90	-	0.43	0.35	0.71	0.36	0.23	0.25
Copper (total)	µg/L	5	-	1.88	0.88	1.63	0.93	< 1.0	< 1.0
Lead (total)	µg/L	5	7	0.58	0.22	0.91	0.22	0.24	0.26
Nickel (total)	µg/L	25	25	0.80	0.78	1.15	0.85	0.55	0.6
Uranium (total)	µg/L	5	15	2.22 0	3.22 3	1.92 0	1.95 4	1.53 5	1.720
Radium-226	Bq/L	1	-	0.01	0.01	< 0.01	< 0.01	0.02	0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	78.2	64.6	88.8	74.2	92.8	93.9
Beryllium (total)	µg/L	1,100	-	0.02 8	0.01 2	0.04 3	0.01 1	0.01 7	0.017
Boron (total)	µg/L	200	1,500	14	30	22	12	17	22
Cadmium (total)	µg/L	0.20	0.09	0.02 6	0.01 6	0.03 4	0.01 5	0.01 4	0.014
Mercury (dissolved)	µg/L	0.20	0.026	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

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Molybdenum (total)	µg/L	40	73	0.40	0.36	0.42	0.50	0.50	0.50
Selenium (total)	µg/L	100	1	0.17	0.22	0.17	0.15	0.13	0.1
Silver (total)	µg/L	0.1	0.25	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	2.00	1.13	2.62	1.10	1.86	2.07
Zinc (total)	µg/L	30	30	6.3	2.5	5.8	2.3	< 2.0	2.0

Notes:

2024 averages are based on 2 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

**Table 170: Port Hope Long-Term Waste Management Facility Storm Event Sampling
– Brand Creek Watershed (BC-M)**

BC-M									
Parameter	Unit of Measure	Criteria		2024/07/10 8:00AM	2024/07/10 9:00AM	2024/07/10 10:00AM	2024/07/10 11:00AM	2024/07/10 12:00PM	2024/07/10 1:00PM
		PWQO [13]	CWQG [15]						
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	1.6	3.1	1.7	2.4	3.2	3.9
Cobalt (total)	µg/L	0.90	-	0.17	1.47	0.26	1.06	0.84	1.27
Copper (total)	µg/L	5	-	< 1.0	3.0	1.0	3.0	5.0	5.0
Lead (total)	µg/L	5	7	0.23	2.24	0.33	2.40	2.09	2.98
Nickel (total)	µg/L	25	25	0.5	2.9	0.7	1.9	1.7	2.9
Uranium (total)	µg/L	5	15	1.28	1.27	1.16	1.10	0.59	0.78
Radium-226	Bq/L	1	-	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	79.6	113	75.7	82.7	54.3	61.2
Beryllium (total)	µg/L	1,100	-	< 0.007	0.101	0.020	0.077	0.059	0.10
Boron (total)	µg/L	200	1,500	13	14	14	16	13	15
Cadmium (total)	µg/L	0.20	0.09	0.012	0.068	0.020	0.058	0.049	0.069
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	0.40	0.50	< 0.40	< 0.40	0.80	0.70

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Selenium (total)	µg/L	100	1	0.14	0.26	0.15	0.15	0.13	0.2
Silver (total)	µg/L	0.10	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08
Vanadium (total)	µg/L	6	-	1.52	6.25	1.67	4.66	3.78	5.77
Zinc (total)	µg/L	30	30	2	16	3	15	18	24
Additional Parameters									
Staff Gauge	cm	-	-	6	8	17	35	38	34
Total Suspended Solids	mg/L	-	-	6	132	12	153	110	126

Notes:

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

**Table 171: Port Hope Long-Term Waste Management Facility Surface Water
– Lake Ontario Diffuser (BC-LO-D)**

BC-LO-D									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.80	1.03	0.93	1.17	0.87	< 1.0
Cobalt (total)	µg/L	0.90	-	0.06	0.08	0.02	0.04	0.18	< 0.50
Copper (total)	µg/L	5	-	0.85	0.83	1.23	0.97	0.97	1.0
Lead (total)	µg/L	5	7	0.09	0.11	< 0.09	0.20	0.23	< 0.50
Nickel (total)	µg/L	25	25	0.75	0.63	0.53	0.63	0.67	< 1.0
Uranium (total)	µg/L	5	15	0.35 1	0.45 1	0.41 2	1.58 1	0.51 0	0.630
Radium-226	Bq/L	1	-	0.01	0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	23.2	22.1	22.1	23.7	22.3	23.0
Beryllium (total)	µg/L	1,100	-	< 0.00 7	< 0.00 7	0.00 9	< 0.00 7	0.13 8	< 0.40
Boron (total)	µg/L	200	1,500	20	38	24	24	21	23
Cadmium (total)	µg/L	0.20	0.09	0.00 6	0.00 6	0.01 1	0.00 4	0.03 2	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	0.01	< 0.01	< 0.01	0.04	< 0.10

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Molybdenum (total)	µg/L	40	73	1.18	1.18	1.14	1.24	1.13	1.20
Selenium (total)	µg/L	100	1	0.11	0.15	0.16	0.14	0.76	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.25	0.32	0.20	0.23	0.29	< 0.50
Zinc (total)	µg/L	30	30	3.0	< 2.0	2.7	< 2.0	3.0	< 5.0

Notes:

2024 averages are based on 3 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

**Table 172: Port Hope Long-Term Waste Management Facility Surface Water
– Lake Ontario Diffuser – Outside Eastern Edge of Mixing Zone (BC-LO-E)**

BC-LO-E									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.90	0.87	0.83	1.13	0.90	1.1
Cobalt (total)	µg/L	0.90	-	0.06	0.04	0.01	0.05	0.18	< 0.50
Copper (total)	µg/L	5	-	0.95	0.83	0.93	1.23	1.57	2.7
Lead (total)	µg/L	5	7	0.02	0.10	0.10	0.23	0.36	0.91
Nickel (total)	µg/L	25	25	0.60	0.57	0.50	0.63	0.87	1.7
Uranium (total)	µg/L	5	15	0.38 1	0.37 4	0.40 7	1.65 7	0.54 3	0.760
Radium-226	Bq/L	1	-	< 0.01	0.01	0.01	0.02	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	24.6	23.0	22.5	24.1	24.7	32.0
Beryllium (total)	µg/L	1,100	-	< 0.00 7	< 0.00 7	0.00 9	< 0.00 7	0.13 8	< 0.40
Boron (total)	µg/L	200	1,500	22	33	23	23	20	22
Cadmium (total)	µg/L	0.20	0.09	0.00 4	0.00 5	0.00 7	0.00 7	0.03 3	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	0.01	< 0.01	0.04	< 0.10

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Molybdenum (total)	µg/L	40	73	1.96	1.22	1.17	1.18	1.07	1.10
Selenium (total)	µg/L	100	1	0.14	0.18	0.20	0.11	0.75	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.45	0.26	0.18	0.23	0.66	1.60
Zinc (total)	µg/L	30	30	< 2.0	2.3	< 2.0	3.7	3.6	6.8

Notes:

2024 averages are based on 3 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

**Table 173: Port Hope Long-Term Waste Management Facility Surface Water
– Lake Ontario Diffuser – Outside Western Edge of Mixing Zone (BC-LO-W)**

BC-LO-W									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.85	0.83	0.73	1.03	0.87	1.1
Cobalt (total)	µg/L	0.90	-	0.05	0.06	0.04	0.03	0.18	< 0.50
Copper (total)	µg/L	5	-	1.05	0.87	0.70	1.00	1.40	2.2
Lead (total)	µg/L	5	7	0.09	0.16	0.23	0.21	0.31	0.74
Nickel (total)	µg/L	25	25	0.75	0.67	0.47	0.57	0.83	1.5
Uranium (total)	µg/L	5	15	0.35 3	0.35 9	0.51 7	1.57 6	0.51 6	0.630
Radium-226	Bq/L	1	-	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	23.3	23.6	35.0	23.6	24.1	29.0
Beryllium (total)	µg/L	1,100	-	< 0.00 7	0.00 7	0.00 7	< 0.00 7	0.13 8	< 0.40
Boron (total)	µg/L	200	1,500	20	35	27	23	21	22
Cadmium (total)	µg/L	0.20	0.09	0.00 7	0.00 8	0.00 9	0.00 6	0.03 3	< 0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.10

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Molybdenum (total)	µg/L	40	73	1.24	1.39	0.96	1.28	1.10	1.10
Selenium (total)	µg/L	100	1	0.13	0.16	0.12	0.15	0.73	< 2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.31	0.39	0.44	0.21	0.60	1.40
Zinc (total)	µg/L	30	30	2.5	2.3	< 2.0	2.0	3.4	6.1

Notes:

2024 averages are based on 3 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

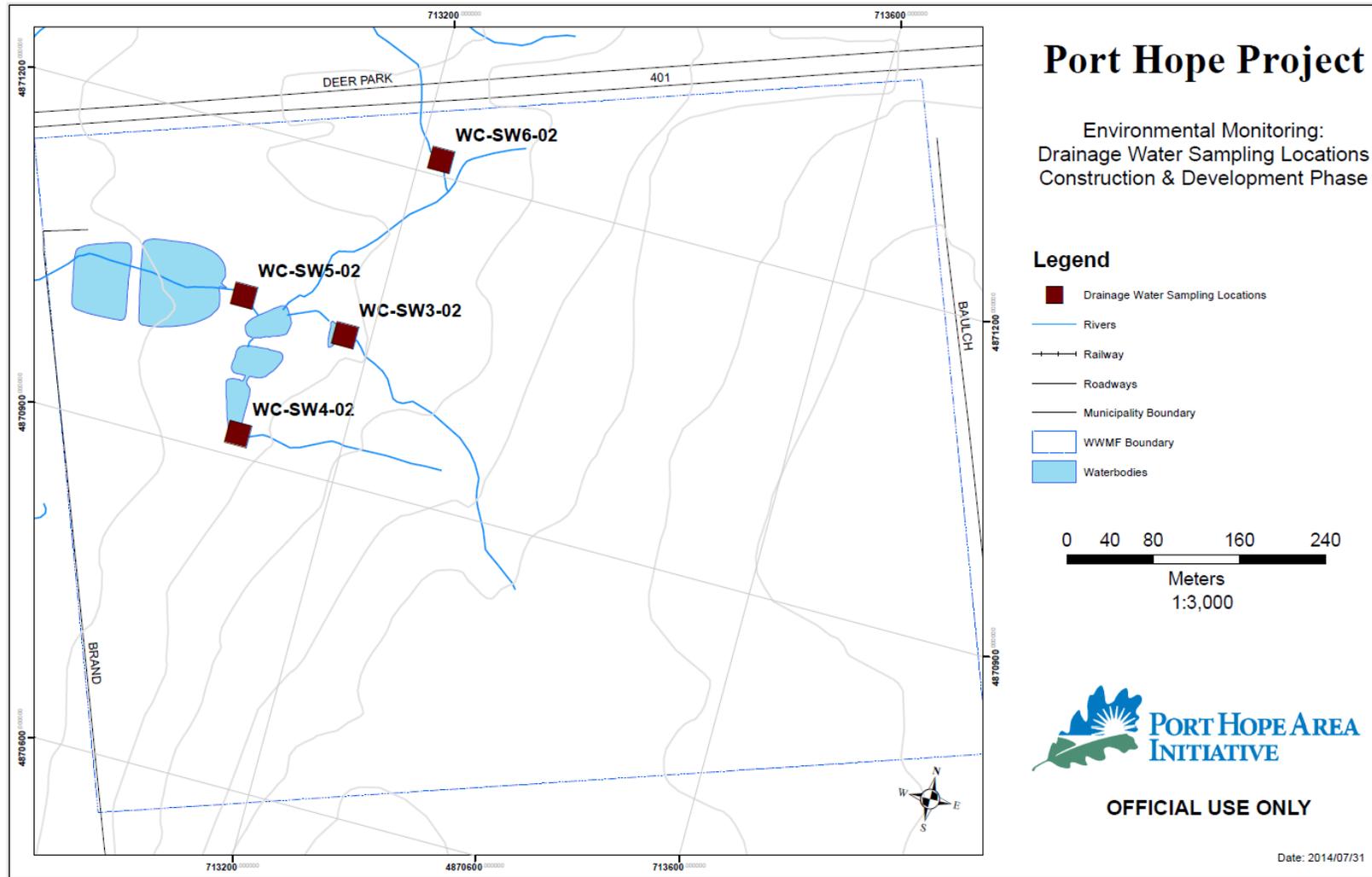


Figure 27: Port Hope Long-Term Waste Management Facility Drainage Water Sampling Locations

Table 174: Port Hope Long-Term Waste Management Facility Drainage Water Quality – Location 1 (WC-SW3-02)

		WC-SW3-02					
Parameter	Unit of Measure	2020	2021	2022	2023	2024	
		Average				Average	Maximum
Primary COPC							
Antimony (total)	µg/L	2.5	6.1	3.2	2.1	1.9	3.1
Arsenic (total)	µg/L	430.0	1,126.0	117.4	176.5	194.5	295.0
Cobalt (total)	µg/L	39.0	2,230.2	476.5	268.1	235.5	424.0
Copper (total)	µg/L	22.8	2,224.1	184.0	106.1	73.0	143.0
Lead (total)	µg/L	4.62	641.80	113.50	56.56	38.50	67.50
Nickel (total)	µg/L	26.0	1,552.8	406.5	394.9	256.5	436.0
Uranium (total)	µg/L	528.0	1,975.5	589.5	808.0	780.0	1,280.0
Radium-226	Bq/L	0.08	0.19	0.33	0.08	0.16	0.26
Thorium-230	Bq/L	< 0.02	0.05	0.02	0.02	0.04	0.06
Thorium-232	Bq/L	< 0.02	0.06	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC							
Barium (total)	µg/L	89.8	217.0	200.0	150.0	159.5	179.0
Beryllium (total)	µg/L	< 0.007	0.018	< 0.007	0.033	0.224	< 0.40
Boron (total)	µg/L	63	123	158	238	279	407
Cadmium (total)	µg/L	0.090	2.496	0.333	0.151	0.165	0.240
Mercury (dissolved)	µg/L	< 0.01	< 0.01	0.01	< 0.01	0.06	< 0.10
Molybdenum (total)	µg/L	2.83	6.91	7.32	4.05	3.95	5.60
Selenium (total)	µg/L	1.88	0.48	0.41	1.18	1.24	< 2.0
Silver (total)	µg/L	< 0.05	0.07	< 0.05	0.06	0.09	< 0.09
Vanadium (total)	µg/L	1.62	2.91	1.98	2.74	3.83	3.85

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Zinc (total)	µg/L	15.0	362.0	93.0	71.0	60.5	108.0
<p>Notes:</p> <p>2024 averages are based on semi-annual (2) sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit.</p>							

Table 175: Port Hope Long-Term Waste Management Facility Drainage Water Quality – Location 3 (WC-SW5-02)

		WC-SW5-02					
Parameter	Unit of Measure	2020	2021	2022	2023	2024	
		Average				Average	Maximum
Primary COPC							
Antimony (total)	µg/L	1.7	5.5	2.3	1.2	1.8	2.9
Arsenic (total)	µg/L	205.0	1,020.0	168.9	111.0	119.0	168.0
Cobalt (total)	µg/L	104.8	2,041.5	373.5	132.2	208.5	388.0
Copper (total)	µg/L	61.5	1,900.0	214.1	51.8	68.8	132.0
Lead (total)	µg/L	12.94	568.95	145.80	86.67	40.05	67.10
Nickel (total)	µg/L	78.2	1,421.0	269.5	206.1	226.5	405.0
Uranium (total)	µg/L	388.0	1,845.5	706.0	409.0	695.0	1,140.0
Radium-226	Bq/L	0.12	0.17	0.23	0.07	0.15	0.18
Thorium-230	Bq/L	< 0.02	0.06	< 0.02	0.04	0.03	0.03
Thorium-232	Bq/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC							
Barium (total)	µg/L	87.3	198.0	175.5	114.9	141.5	153.0
Beryllium (total)	µg/L	0.014	0.013	< 0.007	0.020	0.204	< 0.40
Boron (total)	µg/L	58	120	149	132	261	392
Cadmium (total)	µg/L	0.182	2.301	0.322	0.152	0.157	0.223
Mercury (dissolved)	µg/L	< 0.01	< 0.01	0.01	< 0.01	0.06	< 0.10
Molybdenum (total)	µg/L	5.69	18.08	4.70	2.55	4.35	5.80
Selenium (total)	µg/L	2.12	0.66	0.56	0.46	1.21	< 2.0
Silver (total)	µg/L	< 0.05	0.06	< 0.05	< 0.05	0.08	< 0.09
Vanadium (total)	µg/L	1.94	2.67	2.04	2.14	2.50	2.80

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Zinc (total)	µg/L	28.5	328.5	86.5	117.0	62.5	110.0
<p>Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit.</p>							

Table 176: Port Hope Long-Term Waste Management Facility Drainage Water Quality – Location 4 (WC-SW6-02)

		WC-SW6-02					
Parameter	Unit of Measure	2020	2021	2022	2023	2024	
		Average				Average	Maximum
Primary COPC							
Antimony (total)	µg/L	< 0.9	0.9	< 0.9	< 0.9	0.7	0.9
Arsenic (total)	µg/L	43.0	63.1	14.3	7.6	10.2	15.7
Cobalt (total)	µg/L	2.7	1.4	0.3	0.1	1.5	2.8
Copper (total)	µg/L	7.9	2.2	1.1	0.8	3.2	5.3
Lead (total)	µg/L	2.11	0.74	0.22	0.12	1.72	3.30
Nickel (total)	µg/L	4.4	2.2	0.8	0.6	2.8	4.8
Uranium (total)	µg/L	65.8	325.0	48.8	27.5	22.6	35.8
Radium-226	Bq/L	0.01	0.02	0.02	< 0.01	0.01	0.01
Thorium-230	Bq/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC							
Barium (total)	µg/L	136.9	115.4	94.3	99.6	138.2	180.0
Beryllium (total)	µg/L	0.171	0.027	< 0.007	0.008	0.204	< 0.40
Boron (total)	µg/L	34	48	56	44	48	56
Cadmium (total)	µg/L	0.022	0.011	0.005	0.007	0.048	< 0.090
Mercury (dissolved)	µg/L	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.10
Molybdenum (total)	µg/L	1.32	1.60	1.26	0.74	1.30	1.60
Selenium (total)	µg/L	1.18	2.00	0.13	0.17	1.11	< 2.0
Silver (total)	µg/L	< 0.05	0.05	< 0.05	< 0.05	0.07	< 0.09
Vanadium (total)	µg/L	10.79	2.34	1.52	0.72	7.13	13.00

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Zinc (total)	µg/L	13.5	39.5	2.5	2.0	10.0	18.0
Notes: 2024 averages are based on semi-annual (2) sampling results. Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit.							

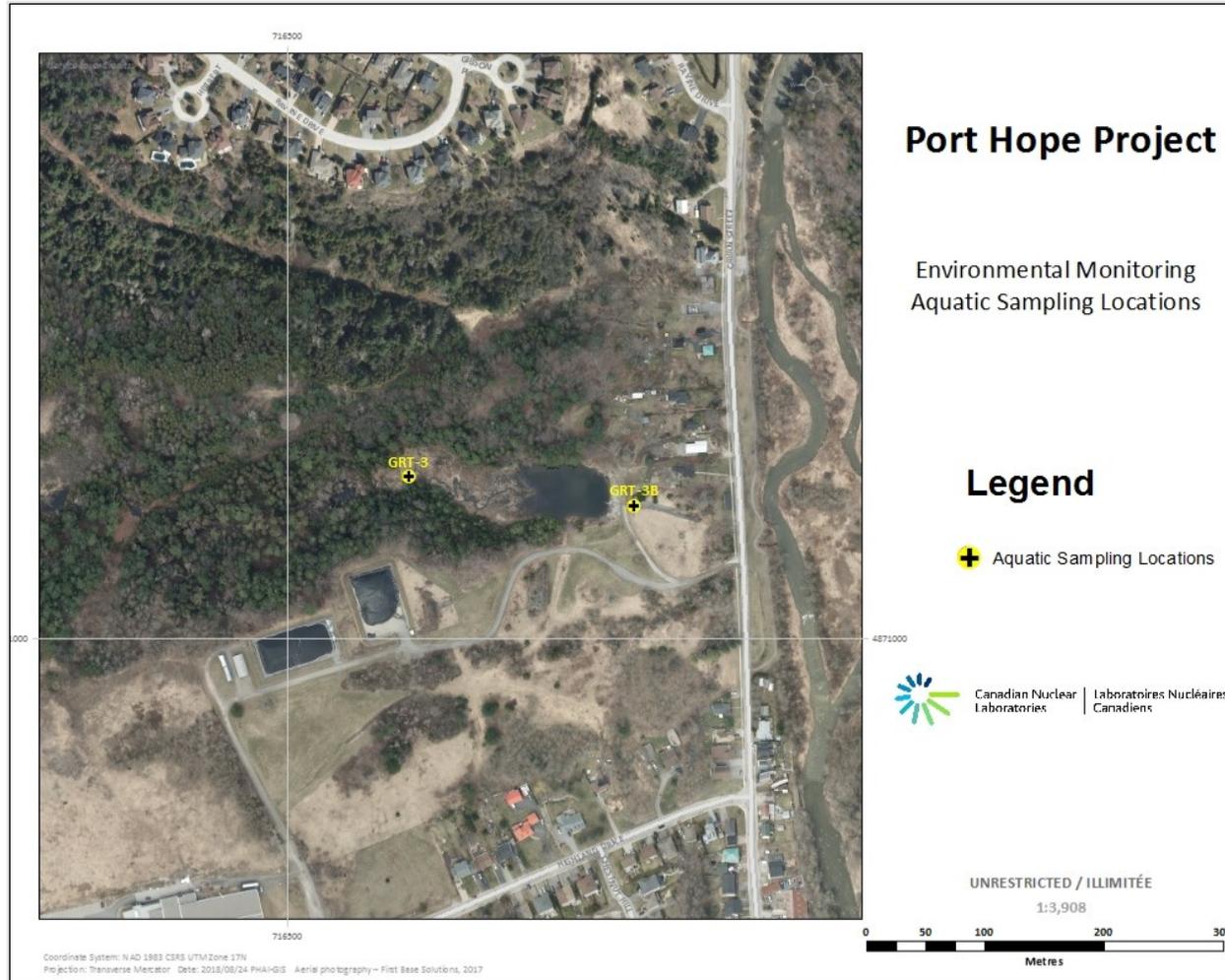


Figure 28: Port Hope Project Brewery Creek Aquatic Sampling Locations

**Table 177: Port Hope Project Highland Drive Landfill Surface Water Quality
– Brewery Creek – Upstream (GRT-3)**

GRT-3									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	0.43	0.38	0.33	0.28	0.55	1.3
Cobalt (total)	µg/L	0.90	-	0.10	0.06	0.05	0.06	0.16	0.44
Copper (total)	µg/L	5	-	1.13	0.45	0.30	0.75	0.85	< 1.0
Lead (total)	µg/L	5	7	0.34	0.21	0.16	0.41	0.40	0.91
Nickel (total)	µg/L	25	25	0.35	0.83	0.30	0.35	0.40	0.5
Uranium (total)	µg/L	5	15	0.98 9	1.06 7	1.03 3	1.01 4	1.02 3	1.130
Radium-226	Bq/L	1	-	< 0.01	0.02	< 0.01	0.01	0.01	0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	123. 0	133. 8	127. 5	134. 5	135. 8	143.0
Beryllium (total)	µg/L	1,100	-	0.00 9	< 0.00 7	< 0.00 7	0.00 7	0.00 7	0.01
Boron (total)	µg/L	200	1,500	30	34	30	33	27	30
Cadmium (total)	µg/L	0.20	0.09	0.01 2	0.00 6	0.00 6	0.00 7	0.01 3	0.023
Mercury (dissolved)	µg/L	0.20	0.026	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

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Molybdenum (total)	µg/L	40	73	0.24	0.20	0.19	0.19	0.34	< 0.40
Selenium (total)	µg/L	100	1	0.34	0.29	0.32	0.28	0.30	0.3
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.89	0.69	0.63	0.65	0.85	1.21
Zinc (total)	µg/L	30	30	3.5	2.5	< 2.0	2.3	< 2.0	< 2.0

Notes:

2024 averages are based on 4 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

**Table 178: Port Hope Project Highland Drive Landfill Surface Water Quality
– Brewery Creek – Downstream (GRT-3B)**

GRT-3B									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	0.35	0.38	0.30	0.30	0.30	0.3
Cobalt (total)	µg/L	0.90	-	0.05	0.05	0.05	0.05	0.05	0.07
Copper (total)	µg/L	5	-	0.85	0.30	0.30	0.28	0.80	1.0
Lead (total)	µg/L	5	7	0.05	0.11	0.14	< 0.09	0.11	0.15
Nickel (total)	µg/L	25	25	0.23	0.50	0.33	0.25	0.30	0.3
Uranium (total)	µg/L	5	15	1.55 5	1.49 5	1.51 0	1.54 3	1.44	1.91
Radium-226	Bq/L	1	-	0.01	0.01	< 0.01	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	117. 8	127. 3	120. 1	127. 5	121. 3	126.0
Beryllium (total)	µg/L	1,100	-	< 0.00 7	0.01				
Boron (total)	µg/L	200	1,500	35	35	32	36	27	28
Cadmium (total)	µg/L	0.20	0.09	0.00 5	0.00 5	0.00 6	0.00 3	0.00 3	0.003
Mercury (dissolved)	µg/L	0.20	0.026	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

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Molybdenum (total)	µg/L	40	73	0.21	0.19	0.31	0.18	0.34	< 0.40
Selenium (total)	µg/L	100	1	0.26	0.28	0.26	0.28	0.26	0.3
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.64	0.60	0.55	0.55	0.53	0.63
Zinc (total)	µg/L	30	30	3.0	2.0	< 2.0	2.8	< 2.0	2.0

Notes:

2024 averages are based on 4 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;



Figure 29: Port Hope Project Highland Drive South Creek Aquatic Sampling Locations

Table 179: Port Hope Project Highland Drive South Creek Surface Water Quality – Downstream (HC-D)

HC-D									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	7.98	7.05	6.85	7.25	9.70	12.90
Cobalt (total)	µg/L	0.90	-	0.22	0.14	0.13	0.15	0.14	0.18
Copper (total)	µg/L	5	-	1.13	0.33	0.38	0.43	2.75	8.0
Lead (total)	µg/L	5	7	0.39	0.12	0.11	0.20	0.11	0.14
Nickel (total)	µg/L	25	25	1.08	0.93	0.98	1.03	1.03	1.2
Uranium (total)	µg/L	5	15	35.30	32.86	39.48	34.85	34.54	49.56
Radium-226	Bq/L	1	-	0.01	0.01	< 0.01	< 0.01	< 0.01	0.01
Thorium-230	Bq/L	-	-	< 0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	207.8	202.0	206.8	188.8	198.5	211.0
Beryllium (total)	µg/L	1,100	-	0.016	< 0.007	0.029	0.008	< 0.007	< 0.01
Boron (total)	µg/L	200	1,500	484	438	485	436	393	418
Cadmium (total)	µg/L	0.20	0.09	0.006	0.007	0.032	0.015	0.006	0.008
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	2.21	0.64	0.63	0.60	4.80	17.40

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Selenium (total)	µg/L	100	1	0.65	0.38	0.29	0.45	0.33	0.4
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.53	0.37	0.38	0.39	0.35	0.45
Zinc (total)	µg/L	30	30	3.3	4.5	2.5	3.5	2.5	3.0

Notes:

2024 averages are based on 4 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 180: Port Hope Project Highland Drive South Creek Surface Water Quality – Upstream (HC-U)

		HC-U							
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	3.85	4.50	3.00	3.15	2.73	5.10
Cobalt (total)	µg/L	0.90	-	0.23	0.16	0.13	0.20	0.15	0.16
Copper (total)	µg/L	5	-	1.53	0.45	0.33	0.50	3.75	12.0
Lead (total)	µg/L	5	7	0.18	0.38	0.17	0.44	0.16	0.21
Nickel (total)	µg/L	25	25	1.08	0.93	0.98	1.03	0.98	1.2
Uranium (total)	µg/L	5	15	8.71	9.05	8.99	9.42	8.34	9.73
Radium-226	Bq/L	1	-	0.01	0.02	0.02	0.01	0.01	0.02
Thorium-230	Bq/L	-	-	0.03	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	216.8	209.0	216.0	197.8	207.3	216.0
Beryllium (total)	µg/L	1,100	-	0.010	< 0.007	0.030	0.008	< 0.007	< 0.01
Boron (total)	µg/L	200	1,500	462	397	454	401	372	400
Cadmium (total)	µg/L	0.20	0.09	0.008	0.007	0.005	0.020	0.011	0.019
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	8.47	0.65	0.64	0.59	6.68	25.00
Selenium (total)	µg/L	100	1	1.82	0.41	0.26	0.49	0.35	0.4
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.57	0.64	0.44	0.68	0.48	0.52

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Zinc (total)	µg/L	30	30	4.0	5.3	29.8	5.0	3.0	4.0
<p>Notes:</p> <p>2024 averages are based on 4 sampling results.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 181: Port Hope Project Highland Drive South Creek Watershed Storm Event Sampling – (HC-D)

HC-D									
Parameter	Unit of Measure	Criteria		2024/04/03 9:30AM	2024/04/03 10:30AM	2024/04/03 11:40AM	2024/04/03 12:30PM	2024/04/03 1:40PM	2024/04/03 2:50PM
		PWQO [13]	CWQG [15]						
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	6.7	6.8	6.6	6.7	6.7	6.8
Cobalt (total)	µg/L	0.90	-	0.12	0.14	0.12	0.13	0.12	0.13
Copper (total)	µg/L	5	-	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lead (total)	µg/L	5	7	0.09	0.11	< 0.09	< 0.09	0.11	0.13
Nickel (total)	µg/L	25	25	1.0	1.0	0.9	1.0	0.9	1.0
Uranium (total)	µg/L	5	15	60.5	62.6	62.7	63.6	63.5	64.8
Radium-226	Bq/L	1	-	0.02	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	176	188	183	185	175	180
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.01
Boron (total)	µg/L	200	1,500	357	372	356	422	336	345
Cadmium (total)	µg/L	0.20	0.09	< 0.003	0.019	0.004	< 0.003	0.004	0.004
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	0.5	0.6	0.5	0.6	0.5	0.5
Selenium (total)	µg/L	100	1	0.27	0.32	0.26	0.27	0.29	0.3
Silver (total)	µg/L	0.10	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.29	0.31	0.30	0.32	0.27	0.34

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Zinc (total)	µg/L	30	30	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Additional Parameters									
Staff Gauge	cm	-	-	3	3	2	2	3	7
Total Suspended Solids	mg/L	-	-	3	2	2	2	3	5
<p>Notes: Bold values indicate an exceedance of criteria. < – indicates the result was less than the laboratory method detection limit;</p>									

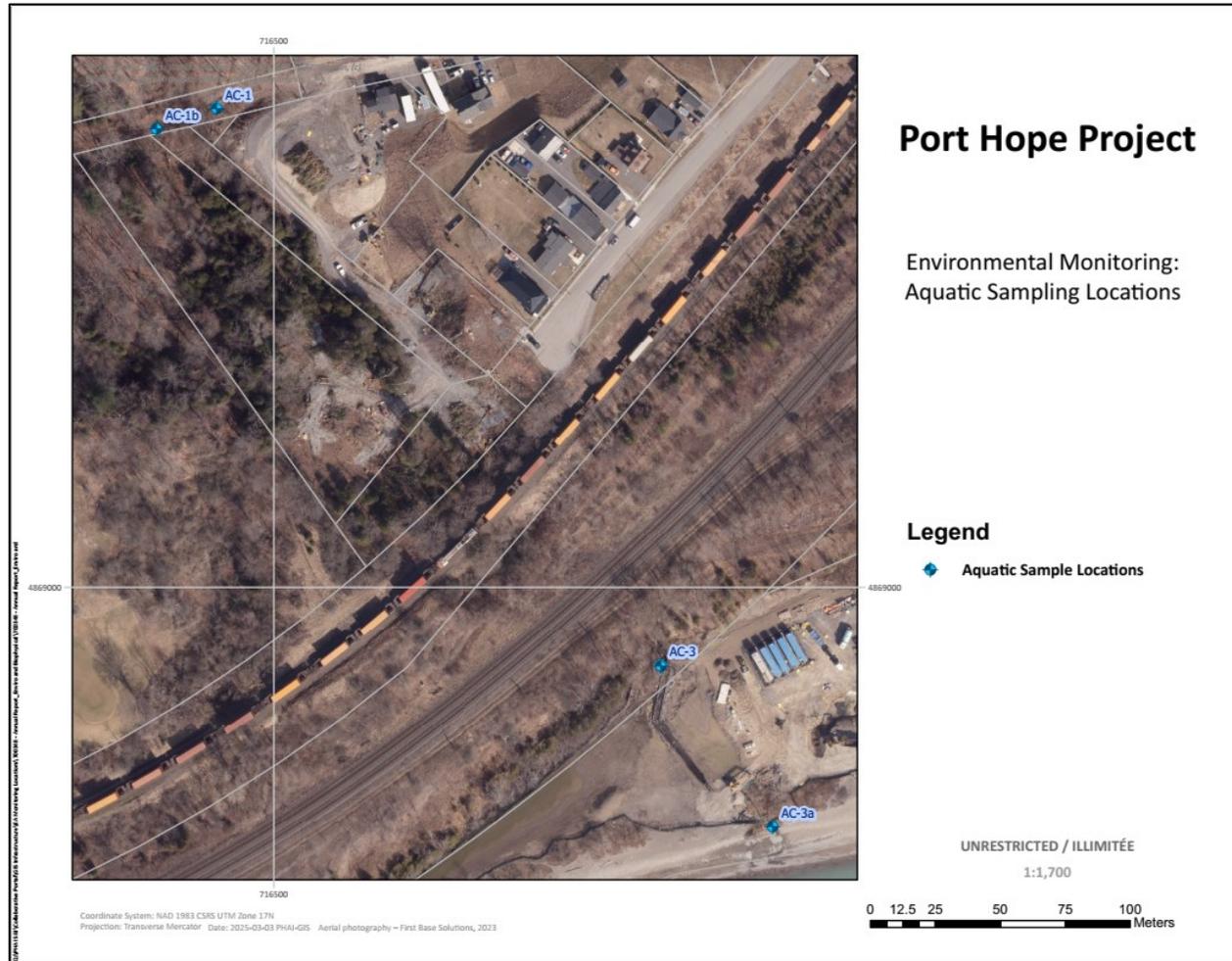


Figure 30: Port Hope Project Alexander Creek Aquatic Sampling Locations

Table 182: Alexander Creek Surface Water Quality – Upstream (AC-1)

Parameter	Unit of Measure	Criteria		AC-1				AC-1b ^a	
		PWQO [13]	CWQG [15]	2020	2021	2022	2023	2024	
				Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	2.15	1.50	1.58	4.18	3.53	4.7
Cobalt (total)	µg/L	0.90	-	0.19	0.10	0.10	0.64	0.33	0.61
Copper (total)	µg/L	5	-	1.40	0.60	0.58	2.55	1.25	2.0
Lead (total)	µg/L	5	7	0.69	0.40	0.40	3.08	1.54	3.05
Nickel (total)	µg/L	25	25	0.50	0.63	0.48	1.70	0.73	1.0
Uranium (total)	µg/L	5	15	2.950	3.183	3.058	2.850	3.693	4.260
Radium-226	Bq/L	1	-	0.01	0.01	0.02	0.01	0.01	0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	140.3	146.8	144.5	136.0	114.8	124.0
Beryllium (total)	µg/L	1,100	-	0.013	0.008	0.010	0.044	0.023	0.05
Boron (total)	µg/L	200	1,500	53	55	53	61	57	61
Cadmium (total)	µg/L	0.20	0.09	0.013	0.007	0.010	0.058	0.030	0.054
Mercury (dissolved)	µg/L	0.20	0.026	0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	0.20	0.21	0.30	0.30	< 0.40	< 0.40
Selenium (total)	µg/L	100	1	0.83	0.87	0.97	0.99	0.90	1.1
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05

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Vanadium (total)	µg/L	6	-	1.24	0.90	0.92	2.82	1.86	2.71
Zinc (total)	µg/L	30	30	4.3	3.3	2.3	10.0	4.5	8.0

Notes:

2024 averages are based on 4 sampling results.

Bold values indicate an exceedance of criteria.

a. New sampling location.

< – indicates the result was less than the laboratory method detection limit;

Table 183: Alexander Creek Surface Water Quality – Downstream (AC-3)

Parameter	Unit of Measure	Criteria		AC-3				AC-3a ^a	
		PWQ O [13]	CWQG [15]	2020	2021	2022	2023	2024	
				Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	2.98	2.33	1.75	1.93	2.50	3.3
Cobalt (total)	µg/L	0.90	-	0.26	0.21	0.13	0.14	0.11	0.15
Copper (total)	µg/L	5	-	1.73	0.90	0.60	0.78	< 1.00	< 1.0
Lead (total)	µg/L	5	7	1.17	0.77	0.61	0.49	0.34	0.63
Nickel (total)	µg/L	25	25	0.63	0.85	0.55	0.55	0.50	0.7
Uranium (total)	µg/L	5	15	7.025	6.263	6.205	7.143	10.01	17.10
Radium-226	Bq/L	1	-	0.02	0.02	0.02	0.01	0.01	0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	154.8	149.3	146.0	147.3	140.3	142.0
Beryllium (total)	µg/L	1,100	-	0.014	0.009	0.009	0.009	0.008	0.01
Boron (total)	µg/L	200	1,500	51	47	44	54	50	60
Cadmium (total)	µg/L	0.20	0.09	0.017	0.010	0.013	0.011	0.009	0.016
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Molybdenum (total)	µg/L	40	73	0.25	0.27	0.28	0.34	0.45	0.60
Selenium (total)	µg/L	100	1	0.72	0.82	0.78	0.79	0.73	0.9
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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Vanadium (total)	µg/L	6	-	1.22	1.03	0.81	0.82	0.78	0.87
Zinc (total)	µg/L	30	30	6.8	5.0	3.8	4.0	5.0	6.0

Notes:

2024 averages are based on 4 sampling results.

Bold values indicate an exceedance of criteria.

a. New sampling location.

< – indicates the result was less than the laboratory method detection limit;

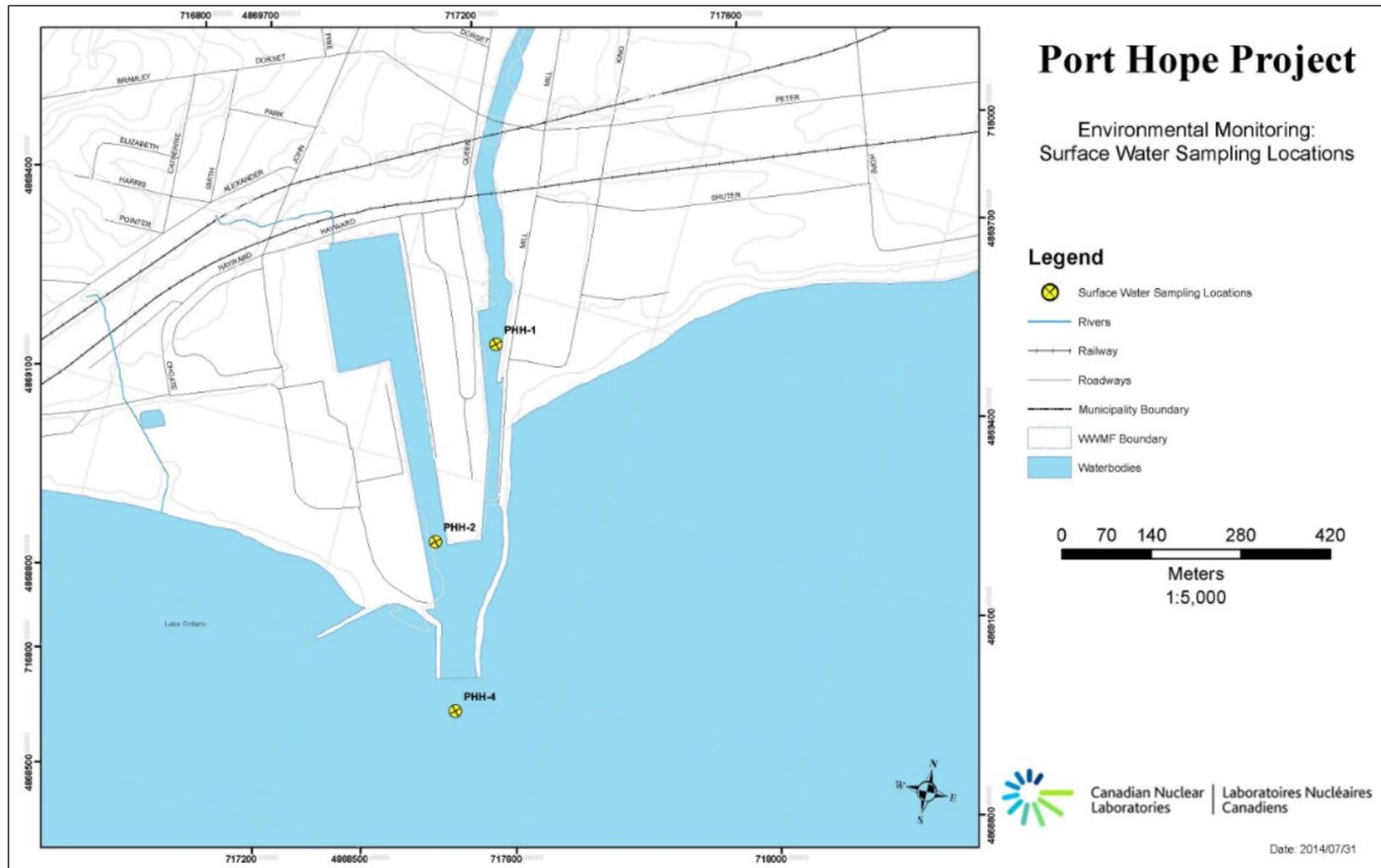


Figure 31: Port Hope Project Harbour Surface Water Sampling Locations

Table 184: Lake Ontario Port Hope Harbour Surface Water Quality – Location 1 (PHH-1)

PHH-1									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	No sample	< 0.90	< 0.90	< 0.90
Arsenic (total)	µg/L	100	5	0.70	0.47		0.43	0.65	0.80
Cobalt (total)	µg/L	0.90	-	0.06	0.05		0.06	0.07	0.09
Copper (total)	µg/L	5	-	0.75	0.37		0.53	1.00	< 1.0
Lead (total)	µg/L	5	7	0.14	0.14		0.25	0.17	0.24
Nickel (total)	µg/L	25	25	0.15	0.13		0.20	0.25	0.3
Uranium (total)	µg/L	5	15	0.78	0.77		0.86	0.61	0.61
Radium-226	Bq/L	1	-	< 0.01	< 0.01		0.02	0.01	0.01
Thorium-230	Bq/L	-	-	< 0.02	< 0.02		< 0.02	0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02		< 0.02	0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	65.0	59.4		61.4	57.6	57.7
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007		< 0.007	0.007	< 0.01
Boron (total)	µg/L	200	1,500	17	25		18	15	15
Cadmium (total)	µg/L	0.20	0.09	0.006	0.006		0.004	0.007	0.009
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01		< 0.01	0.01	< 0.01
Molybdenum (total)	µg/L	40	73	1.09	0.46		0.46	0.45	0.50
Selenium (total)	µg/L	100	1	0.09	0.10		0.09	0.12	0.2
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05		< 0.05	0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.88	0.63		0.57	0.78	1.02

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Zinc (total)	µg/L	30	30	2.0	2.0		2.0	2.0	< 2.0
<p>Notes:</p> <p>2024 averages are based on 2 sampling results. Two samples not collected due to low lake level and safety concerns.</p> <p>Bold values indicate an exceedance of criteria.</p> <p>< – indicates the result was less than the laboratory method detection limit;</p>									

Table 185: Lake Ontario Port Hope Harbour Surface Water Quality – Location 2 (PHH-2)

PHH-2									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	0.90	1.00	0.90	< 0.90
Arsenic (total)	µg/L	100	5	2.30	8.43	54.00	16.77	1.95	2.90
Cobalt (total)	µg/L	0.90	-	0.13	0.31	1.78	0.45	0.06	0.10
Copper (total)	µg/L	5	-	0.80	1.10	5.20	2.03	< 1.00	< 1.0
Lead (total)	µg/L	5	7	0.35	4.63	40.80	5.80	0.33	0.56
Nickel (total)	µg/L	25	25	0.30	0.80	3.40	1.07	0.40	0.5
Uranium (total)	µg/L	5	15	1.67	35.35	112.00	60.20	4.48	8.05
Radium-226	Bq/L	1	-	0.03	0.07	0.37	0.15	0.02	0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	65.5	54.2	52.9	55.5	40.5	57.7
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007	0.011	< 0.007	0.007	< 0.01
Boron (total)	µg/L	200	1,500	18	39	28	20	18	20
Cadmium (total)	µg/L	0.20	0.09	0.005	0.005	0.014	0.004	0.004	0.004
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01

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Molybdenum (total)	µg/L	40	73	0.48	0.68	1.07	0.97	0.85	1.10
Selenium (total)	µg/L	100	1	0.10	0.13	0.18	0.09	0.14	0.1
Silver (total)	µg/L	0.1	0.25	< 0.05	0.06	0.12	0.05	0.05	< 0.05
Vanadium (total)	µg/L	6	-	0.96	0.62	1.28	0.57	0.59	0.94
Zinc (total)	µg/L	30	30	3.0	< 2.3	6.0	3.7	2.0	< 2.0

Notes:

2024 averages are based on 2 sampling results. Two samples not collected to low lake level and safety concerns.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

Table 186: Lake Ontario Port Hope Harbour Surface Water Quality – Location 3 (PHH-4)

PHH-4									
Parameter	Unit of Measure	Criteria		2020	2021	2022	2023	2024	
		PWQO [13]	CWQG [15]	Average				Average	Maximum
Primary COPC									
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	< 0.90	0.77	< 0.90
Arsenic (total)	µg/L	100	5	0.90	0.83	3.27	1.03	1.03	1.30
Cobalt (total)	µg/L	0.90	-	0.04	0.02	0.07	0.02	0.19	0.50
Copper (total)	µg/L	5	-	0.85	0.83	1.13	0.83	0.97	< 1.0
Lead (total)	µg/L	5	7	0.06	0.09	1.22	0.13	0.25	0.50
Nickel (total)	µg/L	25	25	0.55	0.60	0.57	0.57	0.70	1.0
Uranium (total)	µg/L	5	15	0.40	0.39	10.27	1.36	2.16	4.20
Radium-226	Bq/L	1	-	< 0.01	< 0.01	0.02	0.02	< 0.01	0.02
Thorium-230	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Thorium-232	Bq/L	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Secondary COPC									
Barium (total)	µg/L	-	-	25.6	22.7	27.7	23.5	31.4	41.0
Beryllium (total)	µg/L	1,100	-	< 0.007	< 0.007	0.008	< 0.007	0.138	< 0.40
Boron (total)	µg/L	200	1,500	22	26	25	23	18	20
Cadmium (total)	µg/L	0.20	0.09	0.005	0.008	0.007	0.004	0.033	0.090
Mercury (dissolved)	µg/L	0.20	0.026	< 0.01	< 0.01	0.01	< 0.01	0.04	< 0.10
Molybdenum (total)	µg/L	40	73	1.86	1.42	1.08	1.21	0.95	1.10
Selenium (total)	µg/L	100	1	0.12	0.16	0.17	0.15	0.73	2.0

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Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.09
Vanadium (total)	µg/L	6	-	0.46	0.26	0.29	0.21	0.37	0.50
Zinc (total)	µg/L	30	30	< 2.0	< 2.0	< 2.0	2.7	4.0	< 5.0

Notes:

2024 averages are based on 3 sampling results.

Bold values indicate an exceedance of criteria.

< – indicates the result was less than the laboratory method detection limit;

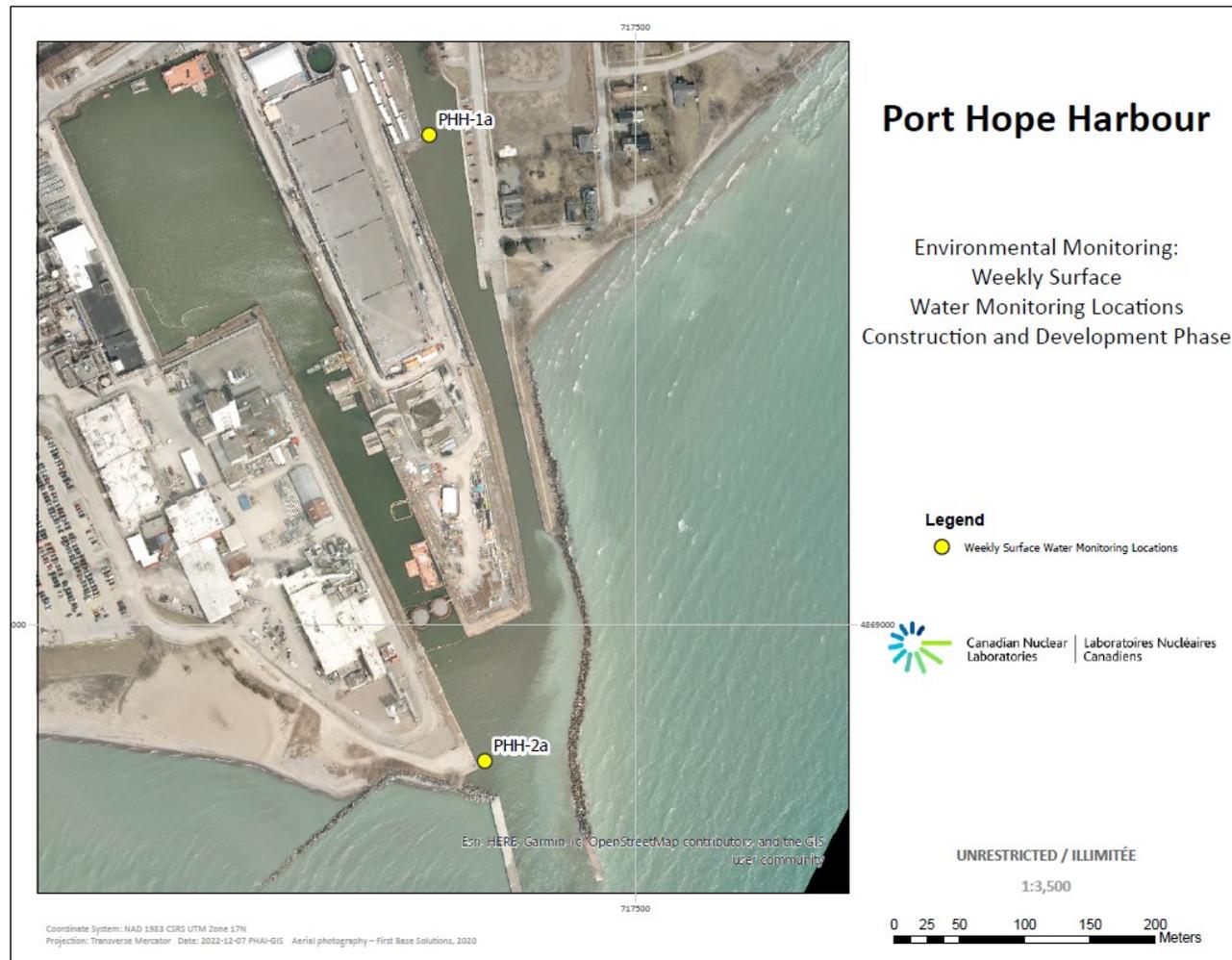


Figure 32: Port Hope Project Harbour Weekly Surface Water Monitoring Locations

Table 187: Lake Ontario Port Hope Harbour Surface Water Quality During Dredging Activities (PHH-1a) – 2024

PHH-1a								
Parameter	Unit of Measure	Criteria		January to March	April to June	July to September	October to December	2024
		PWQO [13]	CWQG [15]	Average				Maximum
Primary COPC								
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	0.60	< 0.90
Arsenic (total)	µg/L	100	5	0.40	0.50	0.58	0.87	1.10
Cobalt (total)	µg/L	0.90	-	0.20	0.09	0.07	0.40	1.02
Copper (total)	µg/L	5	-	1.08	1.0	< 1.0	1.27	4.0
Lead (total)	µg/L	5	7	0.55	0.23	0.23	0.96	4.60
Nickel (total)	µg/L	25	25	0.44	0.27	0.19	0.84	2.0
Uranium (total)	µg/L	5	15	0.98	0.85	0.69	0.83	1.10
Radium-226	Bq/L	1	-	0.01	0.01	< 0.01	0.01	0.01
Secondary COPC								
Barium (total)	µg/L	-	-	62.3	56.5	60.8	65.9	89.7
Beryllium (total)	µg/L	1,100	-	0.018	0.008	< 0.007	0.302	< 0.40
Boron (total)	µg/L	200	1,500	16	17	18	17	27
Cadmium (total)	µg/L	0.20	0.09	0.012	0.006	0.004	0.069	0.090
Molybdenum (total)	µg/L	40	73	0.51	0.43	0.46	< 0.50	1.00
Selenium (total)	µg/L	100	1	0.22	0.14	0.10	1.52	2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	0.08	< 0.09
Vanadium (total)	µg/L	6	-	0.99	0.70	0.73	0.75	4.68
Zinc (total)	µg/L	30	30	3.4	< 2.0	< 2.0	< 4.8	15.0
Notes:								
2024 averages are based on weekly sampling results during dredging activities.								
Bold values indicate an exceedance of criteria.								
< – indicates the result was less than the laboratory method detection limit;								

Table 188: Lake Ontario Port Hope Harbour Surface Water Quality During Dredging Activities (PHH-2a) – 2024

PHH-2a								
Parameter	Unit of Measure	Criteria		January to March	April to June	July to September	October to December	2024
		PWQO [13]	CWQG [15]	Average				Maximum
Primary COPC								
Antimony (total)	µg/L	20	-	< 0.90	< 0.90	< 0.90	0.60	< 0.90
Arsenic (total)	µg/L	100	5	1.20	1.76	2.60	3.28	7.10
Cobalt (total)	µg/L	0.90	-	0.27	0.11	0.08	0.41	1.08
Copper (total)	µg/L	5	-	1.23	< 1.00	< 1.00	1.10	3.2
Lead (total)	µg/L	5	7	1.44	0.34	0.44	1.67	6.30
Nickel (total)	µg/L	25	25	0.79	0.33	0.41	0.86	2.8
Uranium (total)	µg/L	5	15	12.11	9.65	4.68	17.51	42
Radium-226	Bq/L	1	-	0.03	0.02	0.02	0.03	0.09
Secondary COPC								
Barium (total)	µg/L	-	-	60.0	54.7	44.9	61.1	92.5
Beryllium (total)	µg/L	1,100	-	0.021	0.008	0.008	0.302	< 0.40
Boron (total)	µg/L	200	1,500	15	16	21	17	50
Cadmium (total)	µg/L	0.20	0.09	0.015	0.007	0.005	0.069	0.090
Molybdenum (total)	µg/L	40	73	0.60	0.54	0.78	0.65	1.70
Selenium (total)	µg/L	100	1	0.21	0.15	0.12	1.52	2.0
Silver (total)	µg/L	0.1	0.25	< 0.05	< 0.05	< 0.05	0.08	< 0.09
Vanadium (total)	µg/L	6	-	1.10	0.67	0.58	0.67	4.43
Zinc (total)	µg/L	30	30	3.8	< 2.0	< 2.1	4.3	14.0
Notes:								
2024 averages are based on weekly sampling results during dredging activities.								
Bold values indicate an exceedance of criteria.								
< – indicates the result was less than the laboratory method detection limit;								



Figure 33: Temporary Storage Site Monitoring – Pine Street Extension Temporary Storage Site

Table 189: Summary of Surface Water Monitoring – Pine Street Extension Temporary Storage Site – 2024

Pine Street Extension Temporary Storage Site 2024 Quarterly														
Parameter	Unit of Measure	Criteria	Pad-2 Composite (WCB, SCB)				Pad-2 East Catch Basin (ECB)				Pad-2 Sump (SW)			
		Investigation Threshold [25]	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Primary COPC														
Radium-226	Bq/L	1.0	0.039	0.028	<0.005	<0.010	<0.005	0.026	<0.005	<0.010	0.012	-	<0.005	<0.010
Arsenic (dissolved)	µg/L	100	0.8	0.5	0.8	1.2	0.4	0.9	0.4	<1.0	0.9	-	0.4	<1.0
Uranium (dissolved)	µg/L	100	2.35	0.664	1.07	3.7	0.593	1.27	0.508	0.45	2.19	-	1.31	2.9

Notes:
 Bold values indicate an exceedance of criteria.
 < – indicates the result was less than the laboratory method detection limit; - – indicates no sample due to a dry location; Q1 – January to March; Q2 – April to June; Q3 – July to September; Q4 – October to December.