Appendix F

Receiving Water Study

DILLON CONSULTING

ENVIROSOIL LIMITED

Pleasant Street Waste Oil Recycling and Water Treatment Facility

Receiving Water Study

October 2022 – 19-1742

October 7, 2022

Envirosoil Limited
927 Rocky Lake Drive
Bedford, NS
B4A 3Z2

Attention: Jerry Scott, M.Eng., P.Eng.
General Manager

Pleasant Street Waste Oil Recycling and Water Treatment Facility
Receiving Water Study

We respectfully submit the following Receiving Water Study regarding the proposed Waste Oil Recycling and Water Treatment Facility for Envirosoil Limited, located at 750 Pleasant Street, Dartmouth, Nova Scotia.

The report outlines Environmental Quality Objectives (EQOs) for substances of potential concern for the Pleasant Street Waste Oil Recycling and Water Treatment Facility. A mixing model was undertaken to determine the dilution ratios at the edge of the mixing zone. Based on the simulated dilution ratios, Effluent Discharge Objectives (EDOs) were calculated for parameters identified as substances of potential concern.

Please contact the undersigned if you have any questions or require additional information

Sincerely,

DILLON CONSULTING LIMITED

Jennifer Bainbridge, P.Eng.
Water Resources Engineer

Jeff Melanson, P.Eng.
Partner

JEB:jes
Attachment(s)

Our file: 19-1742

DILLON CONSULTING

137 Chain Lake Drive
Suite 100
Halifax, Nova Scotia
Canada
B3S 1B3
Telephone
902.450.4000
Fax
902.450.2008

Dillon Consulting Limited

Table of Contents

Figures

Tables

Appendices

References

Executive Summary

Dillon Consulting Limited (Dillon) was engaged by Envirosoil Limited to provide professional services for the development of a Receiving Water Study for the proposed Pleasant Street Waste Oil Recycling and Water Treatment Facility (Treatment Facility) located at a portion of 750 Pleasant Street in Dartmouth, Nova Scotia.

Various sources of wastewater are expected to be accepted at the facility; however, it is Dillon's understanding that some material accepted at the facility will require a pre-delivery product analysis (e.g., laboratory confirmation); while some routine material will be accepted based on its origin, generation process, etc. An in-house lab will complete separate testing, as needed. Approved liquid wastes will be treated at the facility through an Advanced Treatment process system.

Treated wastewater effluent is proposed to then be discharged directly to the Halifax Harbour from a discharge location near the top of the protected (by armour stone) shoreline. The proposed discharge volume is estimated to be 16,000 – 20,000 m^3 per year, and the plant will run in batch or continuous operations depending on the delivery schedule for truck haulers. Approximately 100 m^3 are expected to be discharged into the receiving water body per day.

The Receiving Water Study has been completed to identify proposed Effluent Quality Objectives (EQOs) and estimate Effluent Discharge Objectives (EDOs) for the protection of aquatic life in the receiving water environment. EQOs represent the concentration of a particular substance that will protect water quality in the receiving water environment, while EDOs represent the concentrations of a particular substance, in the effluent, necessary to allow the EQOs to be met at the edge of the mixing zone.

Generic EQOs are generated from established guidelines, while site-specific EQOs are established by adjusting the generic EQOs based on the site-specific factors (i.e., ambient water quality). For substances of potential concern which have no regulatory guideline or for parameters in which the background levels exceed environmental criteria levels, these background levels were set as the EQO (CCME 2008).

A mixing zone is the portion of the receiving water where effluent dilution occurs. Mixing zone extents must be defined on a case-by-case basis that account for local conditions. For this analysis, a mixing zone of 100 m radius from the outfall was used. This limit is expected to be sufficient as it aligns with national standards (e.g., 100 m radius from outfall (ACWWA 2006)) and as the extents of the Pleasant Street Treatment Facility property boundary is over 100 m along the shoreline, meaning the edge of the mixing zone is not expected to reach the shoreline of neighbouring properties.

The Cornell Mixing Zone Expert System (CORMIX) mixing model was used to predict the mixing regime and to calculate dilution ratios at the edge of the mixing zone. CORMIX is a mixing zone modelling tool

supported by U.S. Environmental Protection Agency (EPA), the system emphasizes the role of boundary interaction to estimate steady-state mixing behavior and plume geometry. This mixing model is the commonly accepted mixing model for near-shore applications.

Two model scenarios were used to approximate the proposed mixing conditions:

- Scenario 1: Point Source - assuming the effluent is discharging directly at the surface as a jet from the pipe; and
- Scenario 2: Channel - assuming the flow is discharging overland from the shore as a small channel entering the receiving water.

As the effluent discharge pipe is proposed to discharge near the top of the protected (by armour stone) shoreline of the Halifax Harbour, a critical, yet reasonable and realistic assumption was be made that flow will discharges from the proposed pipe and will flow down the riprap shore as a channel flow and into the Halifax Harbour. For this analysis Scenario 2 was used as the proposed mixing regime and the calculated dilution ratio at the edge of the mixing zone was estimated to be 754:1.

Based on this assumed dilution ratio at the edge of the mixing zone, EDOs were then established for the parameters of concern identified for the Pleasant Street Waste Oil Recycling and Water Treatment Facility.

1.0 Background and Objectives

1.1 Introduction

Dillon Consulting Limited (Dillon) was engaged by Envirosoil Limited to provide professional services for the development of a Receiving Water Study for the proposed Pleasant Street Waste Oil Recycling and Water Treatment Facility (Treatment Facility) in Dartmouth, Nova Scotia. This study has been completed to estimate Effluent Discharge Objectives (EDOs) for the protection of aquatic life in the receiving water environment.

1.2 Background

The proposed Pleasant Street Waste Oil Recycling and Water Treatment Facility project consists of the construction and operation of a facility that will be used for receiving, processing and recycling of waste oil and the treatment of waste water. It is located at a portion of 750 Pleasant Street in Dartmouth, Nova Scotia. The site is also currently being used as an operating liquid asphalt receiving, storage and transfer facility. The location of the proposed Treatment Facility is shown in Figure 1-1.

Figure 1-1: **Site Location**

Target sources of wastewater to be accepted at the facility, primarily include bilge waters, industrial wastewater, surface water oil spills, and used oil. With respect to contaminants of concern from the waste streams (waste oil and waste water), Dillon's understanding is some material accepted at the facility and entering the proposed treatment system will require a pre-delivery product review (including

detailed Waste Profile Sheet submission) from the shipper before they are received. Alternatively, some material will be accepted based on its origin, generation process, etc. It is understood that other sources may be accepted at the Owner's discretion, provided that the produced effluent meets regulatory requirements.

A brief overview of the treatment process is as follows. Approved liquid wastes will be treated at the facility through an Advanced Treatment process system. The plant will be designed such that the treatment train can be started and stopped as required.

Treated wastewater effluent is proposed to then be discharged directly to the Halifax Harbour through a new 200 mm (8") discharge line, to be located immediately adjacent an existing and currently operating site stormwater discharge system (First-Defense® stormwater separator), which also employs a 200 mm (8") discharge line. The new discharge line will connect from the southwest corner of the existing building that will house the treatment equipment to the discharge location near the top of the armour stone protected harbour shoreline. Consistent with the discharge from the stormwater separator, discharge will occur several metres above the ordinary high water mark (OHWM) and will be accessible at all times. No installation of infrastructure is being proposed below the OHWM.

The proposed discharge volume is estimated to be 16,000 – 20,000 m^3 per year, and the plant will run in batch or continuous operations depending on the delivery schedule for truck haulers. Approximately 100 m^3 are expected to be discharged into the receiving environment per day. Discharge from site is done on an as-required basis based on the incoming water quantities and the process does not allow uncontrolled continuous flow.

The purpose of this report is to conduct a receiving water study to establish EDOs that are not expected to result in negative impacts to the receiving water, the Halifax Harbour. This receiving water study will be guided by the Canada-wide Strategy (CWS) for the Management of Municipal Wastewater Effluent outlined in Technical Supplement 3 (Standard Method) of the Canadian Council of Ministers of the Environment (CCME 2008). The Strategy is focused on two main outcomes: improved human health and environmental protection, and improved clarity about the way wastewater effluent is managed and regulated.

The CWS provides a methodology for facilities to develop site-specific EDOs to address substances of concern potentially present in the effluent. EDOs are the substance threshold concentrations that can be discharged in the effluent to maintain adequate protection of human health and environment. They describe the effluent quality necessary to allow the Effluent Quality Objectives (EQOs) to be met at the edge of the mixing zone, in conditions where a mixing zone can be applied. EQOs and EDOs are established by conducting a site-specific wastewater assessment, including characterization of the effluent to determine substances of potential concern; and, characterization of the receiving water to

determine beneficial water uses, ambient water quality, sensitive water users, assimilative capacity and available dilution.

In determining EQOs and EDOs, water quality standards such as the Atlantic Risk-Based Corrective Action (Atlantic RBCA), the Canadian Environmental Quality Guidelines (CEQGs) and the U.S. Environmental Protection Agency's (USEPA) National Recommended Water Quality Criteria along with sampled background data, are used.

2.0 Substances of Potential Concern

2.1 Facility Size Categorization

To differentiate risk posed by the effluent of a wastewater treatment facility, the Standard Method of the CWS for the Management of Municipal Wastewater Effluent (CCME 2008) categorizes a Treatment Facility based on annual average daily flow (ADF) rates. While the facility is not a municipal waste water treatment facility (i.e., not its sole function), the facility will potentially be handling cruise ship grey and black water for a portion of the waste stream requiring treatment that will flow through the facility. Table 2-1 shows the wastewater facility sizing table found in the Standard Method (CCME 2008).

Table 2-1: Wastewater Facility Size Categories (CCME 2008)

Size Category	Flow (m^3/day)
Very Small[1]	<500
Small[1]	>500 – 2,500
Medium	>2,500 – 17,500
Large	>17,500 – 50,000
Very Large	>50,000

[1] Very small and small facilities which have industrial input associated with wastewater will be considered in the medium size category (industrial flow exceeds 5% of total flow)

The proposed discharge volume is estimated to be 16,000 to 20,000 m^3 per year, and the plant will run in batch or continuous operations depending on the delivery schedule for truck haulers. Approximately 100 m^3 are expected to be discharged to the receiving environment per day. Based on this ADF, the Pleasant Street Waste Oil Recycling and Water Treatment Facility is categorized as a "very small" facility as outlined in Table 2-1 (CCME 2008). However, it is assumed that more than 5% of total dry weather flow on an annual average basis is from an industrial source; therefore the facility is categorized as a "medium" facility.

2.2 Determination of Substances of Potential Concern

The substances of potential concern for a "medium" facility, as per the Standard Method, are detailed in Appendix A. This list has been modified to include only substances of potential concern for the Pleasant Street Waste Oil Recycling and Water Treatment Facility.

2.3 Additional Substances Associated with Industrial Discharge

Supplemental substances of concern have been added to the list based on assumed waste intake and possible discharge contaminants for this specific Treatment Facility. A full list of substances of potential concern is also shown in Appendix A.

3.0 Initial Wastewater Characterization

3.1 Selection of Monitoring Substances

An initial characterization program covering a one-year period is typically required by the Standard Method to describe the effluent and identify substances of concern. As there is no existing facility, and the receiving water study is being conducted for the purpose of determining effluent objectives for the design of a new facility, no initial wastewater characterization has been completed.

3.2 Selection of Toxicity Testing

Unknown or unidentified substances may be present in the wastewater effluent. Guidelines to protect against unknown and unidentified substances do not exist, therefore Whole Effluent Toxicity (WET) tests are typically conducted to evaluate acute and chronic effects. Standard regulations indicate effluent must not be acutely lethal to fish. Toxicity testing should be completed on effluent from the Treatment Facility to determine acute and chronic effects. As noted above, since there is no existing facility, and the receiving water study is being conducted for the purpose of determining effluent objectives for the design of a new facility, no WET tests have been completed, however a Microtox analysis unit will be included as part of both the commissioning phase testing, as well as operational monitoring. Microtox analysis utilizes bioluminescent microbe response to non-specific toxic parameters and decreases in light output correlate to toxicity. The test has been used for toxicological studies and water quality monitoring for decade as it is highly sensitive and non-specific (i.e., even if a given contaminant is not chemically analysed, its presence will still result in a failed toxicological test so nothing will “sneak through”). The use of Microtox provides for a broadband sensitive reliable generic screening to ensure that the treatment process has successfully treated the water to remove contaminants.

4.0 Receiving Water Body Characteristics

The Pleasant Street Treatment Facility will discharge directly into the Halifax Harbour. The location of the discharge is proposed to be on the eastern shoreline of the harbour (750 Pleasant Street) in the vicinity of where the Halifax Harbour is divided around McNabs Island, shown in Figure 1-1.

The assessment is based on "critical condition". The Standard Method provides the following guidance on EDO development:

> "...reasonable and realistic but yet protective scenarios should be used. The objective is to simulate the critical conditions of the receiving water, where critical conditions are where the risk that the effluent will have an effect on the receiving environment is the highest – it does not mean using the highest effluent flow, the lowest river flow and the highest background concentration simultaneously."

To support this study, it is proposed that typical tidal conditions in the harbour be considered along with a sensitivity analysis to evaluate potential impacts on mixing due to specific tidal and climatic conditions. In general, less dilution is expected during periods of low water level and velocity in the harbour. Therefore, a set of critical conditions have been considered to support this analysis.

4.1 Ambient Physical Characteristics

Treated effluent from the Pleasant Street Treatment Facility is proposed to be discharged directly into the Halifax Harbour and is, therefore, subject to changes in water level and flow with the tides, resulting in a dynamic flow condition. Since the Halifax Harbour does not experience steady-state behaviour, efforts were made to approximate ambient conditions using critical steady-state flow conditions in the harbour. The resulting flow and level conditions are described below.

4.1.1 Ambient Flow and Level

On average, water surface elevations in tidal areas will vary between Mean Low Water (MLW) and Mean High Water (MHW) within a tidal cycle. The tide in the Halifax Harbour is semidiurnal with two high and low levels each day, respectively. The range of the tide cycle is estimated to be approximately 1.75 m in the vicinity of the Pleasant Street Treatment Facility discharge.

Tidal currents change direction twice during a tide cycle at each slack tide. Slack tides occur near the MLW, referred to as Low Water Slack (LWS), and near the MHW, referred to as High Water Slack (HWS).

WebTide Tidal Prediction Model (Bedford Institute of Oceanography), a modelling tool used to estimate water level and current velocity along Canada's coasts, was used to gather estimates of this data in the vicinity of the outfall. Simulated hourly water level and current velocity estimates were obtained from

WebTide over a twenty (20) year period. An example of a tidal cycle from this data is shown in Figure 4-1.This simulated tidal cycle represents the lowest water level simulated over the 20 year period, occurring on June 17, 2015. Lower water level result in a smaller cross sectional area allocated for mixing. This day was chosen as less dilution is expected during periods of low water level, resulting in critical, yet reasonable and realistic scenarios.

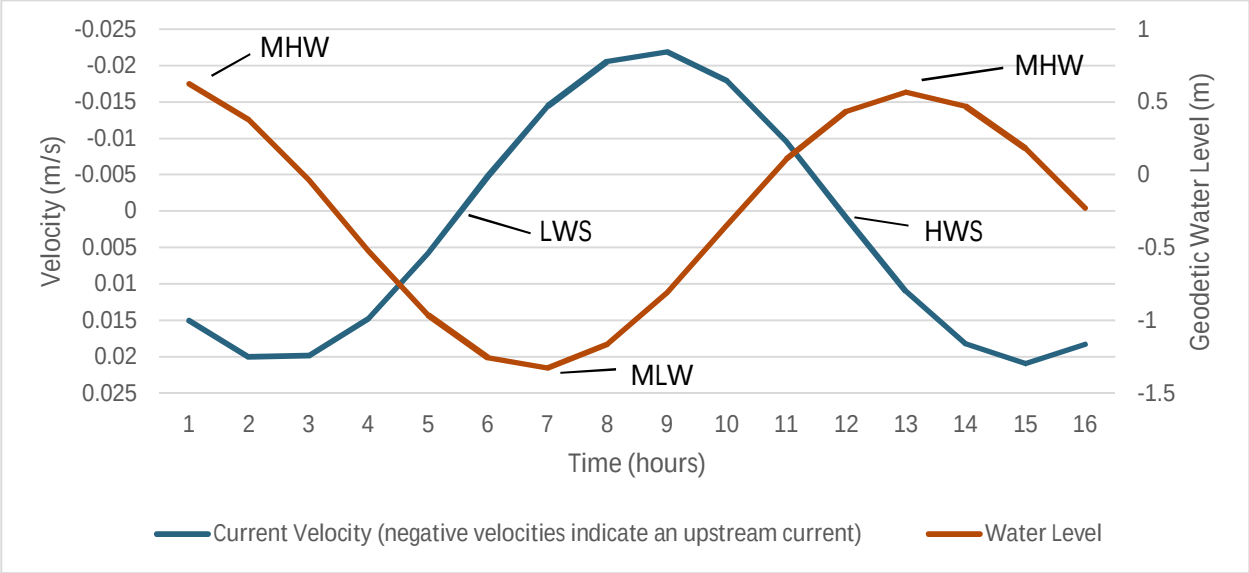


Figure 4-1: **Simulated Level and Current Velocities in the Halifax Harbour near the Treatment Facility Outfall during Low Flow Conditions (June 17, 2015, WebTide Tidal Prediction Model)**

To approximate critical mixing conditions in the harbour, the root mean square (RMS) of tidal velocity was calculated for the tidal cycle shown in Figure 4-1. The RMS estimates the quadratic mean independent of flow direction and is expected to represent a realistic worst-case of ambient conditions. The RMS velocity to be used in model simulation was calculated to be 0.014 m/s.

Bathymetry in the vicinity of the outfall was estimated using navigational chart data obtained from Navionics (2021). Navionics (2021) is an online resource of detailed cartography maps for marine environments and lakes based on Canadian Hydrographic Service (CHS) data. Navigational chart depths are shown from a low-water level datum known as Chart Datum. Chart Datum is roughly equivalent to the mean lower low water (MLLW) during a spring tide cycle. The Bedford Institute vertical datum transformation station (Station ID: 491) was used to convert Chart Datum elevations to geodetic elevations (CGVD2013). The bathymetric channel cross section (perpendicular to water flow) interpolated from Navionics (2021) is shown in Figure 4-2. As a “critical condition” this analysis will use the MLLW as ambient level conditions.

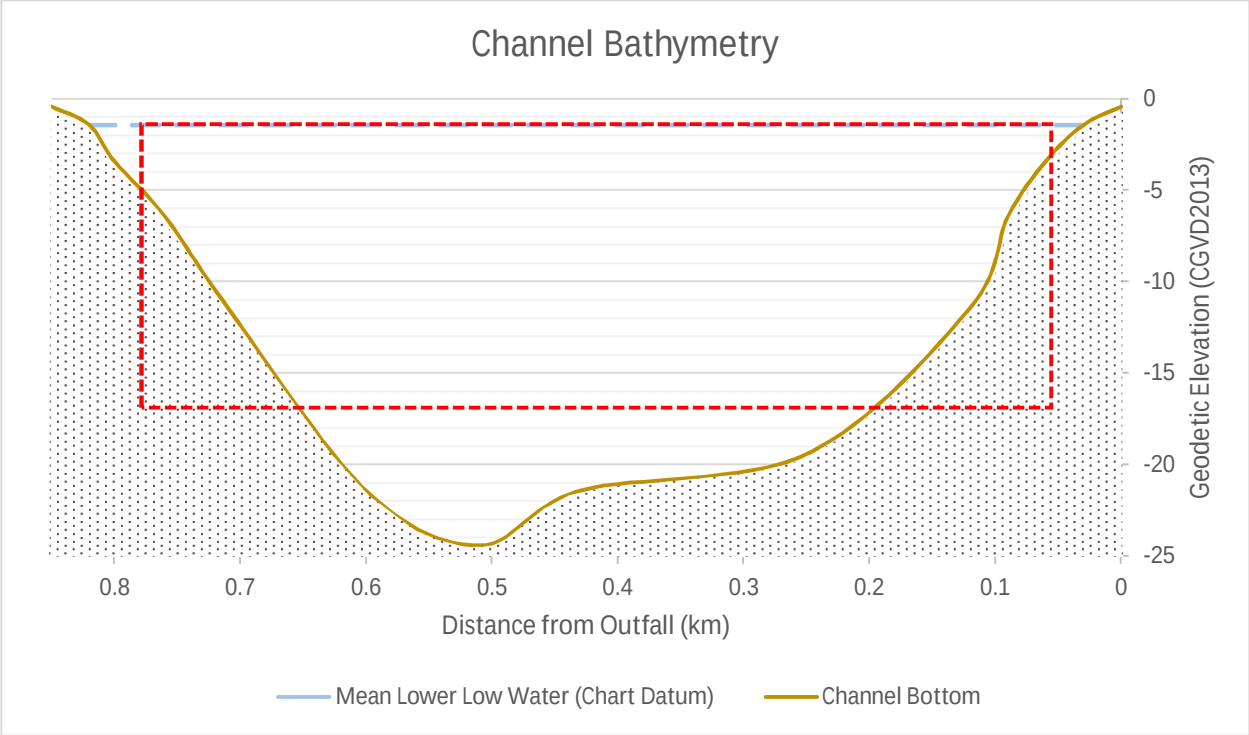


Figure 4-2: Channel Bathymetry Perpendicular to Ambient Flow

It can be seen in Figure 4-2 that the channel is approximately 0.85 km wide. The deepest section of the channel is assumed to be approximately 23 m deep from the MLLW. For this analysis a rectangular schematized bounded cross section was used as the ambient water body geometry. Therefore, the channel was modelled with a width of 0.715 km and a depth of 15.5 m.

4.1.2 Wind Speed

Wind speed and direction can have an impact on the circulation, mixing, and plume movement at the outfall. To account for this, annual hourly mean wind speed data was obtained over a 30 year time period in the vicinity of the study site from various Automatic Weather Environment Canada Stations. The average annual hourly mean wind speed was calculated to be 4.12 m/s.

4.2 Resource Usage Downstream

Effluent Quality Objectives (EQOs), which will be established in the following section, are numerical values and narrative statements established to protect the receiving water. The first step in defining EQOs is to define the potential beneficial uses of the receiving waters.

The following beneficial water uses should be examined:

- Primary contact recreational, such as swimming;

- Secondary contact recreational activities like boating and fishing; and
- Ecosystem health for fisheries and freshwater aquatic life.

The shoreline of the Pleasant Street Treatment Facility lot is bordered by Cherubini Metal Works Ltd. to the east and Imperial Oil Ltd to the west. Both bordering properties are used for industrial uses. It is not expected that primary contact through swimming, scuba diving, etc. will occur in the vicinity of the Treatment Facility outfall. The Halifax Harbour in the vicinity of the proposed outfall is closed for harvesting of all species of bivalve molluscs (DFO).

4.2.1 Aquatic Life

The Halifax Harbour, an Atlantic Ocean marine environment, is immediately adjacent the project area. Marine species present in the Halifax Harbour reflect the industrial nature of the harbour and presence of mobile species from surrounding environments. Phytoplankton (small algae/plants within the water column) and zooplankton (small animals within the water column) provide a source of food for other organisms and vary naturally in concentrations based on seasonal conditions. Benthic (bottom dwelling) organisms typically reflect the bottom type (substrate). Bottom animals typical of soft sediments such as within the Halifax Harbour include; worms (marine polychaetes), small shellfish (bivalves) and amphipods. In areas consisting of harder substrate, starfish, crabs, sea urchins, mussels and lobsters are more likely. An underwater benthic study was completed adjacent to the project area in 2020/2021 and can be found in Appendix B.

Marine fish known to occur in the Halifax Harbour include cod (Gadus morhua), herring (Clupea harengus), haddock (Melanogrammus aeglefinus), pollock (Pollachius virens), sculpin (various species), flounder (various species) and mackerel (Scomber scombrus). Several marine mammals are also occasionally present in the harbour including porpoises, seals, and occasional whale species. Additional Species at Risk potentially occurring within 20 km of the project site in adjacent marine habitat (https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html) include fin whale (Balaenoptera physalus), blue whale (Balaenoptera musculus), northern wolffish (Anarhichas denticulatus), North Atlantic right whale (Eubalaena glacialis), leatherback sea turtle (Dermochelys coriacea) and white shark (Carcharodon carcharias). No critical habitat for these species is identified within this 20 km^2 area. A variety of seabirds may use the harbour waters. The most likely users are gulls, cormorants and waterfowl.

4.3 Background Receiving Water Quality

Ambient water quality samples were taken in the Halifax Harbour in the vicinity of the proposed discharge location during two site visits on April 1 and June 22, 2022. Samples were taken from approximately 15-25 m from the ordinary high water mark, during at low tide periods (see Figure 4-3). Raw laboratory results of the samples taken in the Halifax Harbour are shown in Appendix C. Historical

ambient water quality data near the proposed outfall in the Halifax Harbour was not available through online sources.

Envirosoil Limited
Pleasant Street Waste Oil Recycling and Water Treatment Facility
- Receiving Water Study

Background Receiving Water Quality Sampling Location
Figure 4-3

SW Sample Location (April 1 and June 22, 2022)

Project Development Area

Envirosoil Property

Approximate Adjacent Parcels

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY CanVec, ESRI

MAP CREATED BY: SCM
MAP CHECKED BY: PEK
MAP PROJECTION: NAD 1983 UTM Zone 22N

0 12.5 25 50
Meters

PROJECT: 19-1742 STATUS: FINAL Date: 2022-08-03

5.0 Environmental Quality Objectives

Generic Environmental Quality Objectives are generated from established guidelines, such as the CCME Canadian Water Quality Guidelines (CWQGs), and jurisdiction specific guidelines, such as the Atlantic Risk-Based Corrective Action (RBCA). Site-specific EQOs are established by adjusting the generic EQOs based on the site-specific factors (i.e., ambient water quality).

EQOs can be determined by three different approaches:

- Physical/chemical/pathogenic – describes the substance levels that will protect water quality;
- Whole Effluent Toxicity (WET) – describes the proportion of effluent that can enter the receiving waters without causing acute and chronic toxicological effects; and
- Biological criteria (bio-assessed) – describes the level of ecological integrity that must be maintained.

The present assessment follows the physical/chemical/pathogenic approach from the Standard Method outlined in the CCME guidelines. As explained above, no WET tests were conducted at this time. Additionally, the bio-assessment is not included in the Standard Method as it is still being developed (CCME 2008).

EQOs which are generated from established guidelines are shown in Table D-1 in Appendix D. As shown in Table D-1, various substances of potential concern are shown to have no regulatory guideline (NRG). For these parameters, background levels in the receiving water were established through water sampling. These background levels were set as the EQO (CCME 2008). Additionally, for parameters in which the background levels exceed environmental criteria levels, the EQO were set as the background level (CCME 2008).

5.1 Physical/Chemical/Pathogenic Approach

The physical/chemical/pathogenic approach is intended to protect the receiving waters by ensuring that water quality guidelines are being met. EQOs are established by specifying the level of a particular substance that will protect water quality. Substance levels for water quality protection are taken from the CWQGs associated with the identified beneficial water uses. In the event of multiple applicable guidelines, the most stringent is used.

6.0 Mixing Zone Analysis

The Cornell Mixing Zone Expert System (CORMIX) mixing model was used to predict the mixing regime and to calculate dilution ratios at the edge of the mixing zone. CORMIX is a mixing zone modelling tool supported by U.S. Environmental Protection Agency (EPA), the system emphasizes the role of boundary interaction to estimate steady-state mixing behavior and plume geometry.

6.1 Scenario Description

Two model scenarios were used to approximate the proposed mixing conditions:

- Scenario 1: Point Source - assuming the effluent is discharging directly at the surface as a jet from the pipe; and
- Scenario 2: Channel - assuming the flow is discharging overland from the shore as a small channel entering the receiving water.

The effluent flow structure for the Pleasant Street Treatment Facility is designed to discharge as a batch effluent, directly into the Halifax Harbour. The proposed rated capacity of the Treatment Facility is a maximum of 100 m^3/day. As CORMIX is a steady-state continuous simulation model, the effluent from the Pleasant Street Treatment Facility was simulated to continuously discharge the 100 m^3 through a 24 hour day.

6.2 Definition of Mixing Zone

A mixing zone is the portion of the receiving water where effluent dilution occurs. A diagram of a mixing zone is shown in Figure 6-1. In general, the receiving water as a whole will not be exposed to the immediate effluent concentration at the end-of-pipe but to the effluent mixed and diluted with the receiving water. Effluent does not instantaneously mix with the receiving water at the point of discharge. Mixing processes are governed by the physical characteristics of both the receiving ambient water and the effluent being discharged. Ambient conditions that influence the resulting dispersion of the effluent include geometric characteristics of the receiver including width, depth and uniformity of the channel, water density and current velocities. Effluent characteristics that have an effect on the resulting mixing process are water density, water velocity, as well as the geometry of the discharge itself (e.g., submerged or surficial relative to the receiver, originating from a channel, single port or multiport diffuser). Depending on these parameters, mixing can take place over a large area, up to the point where there is no measurable difference between the receiving water and the effluent mixed with the receiving water.

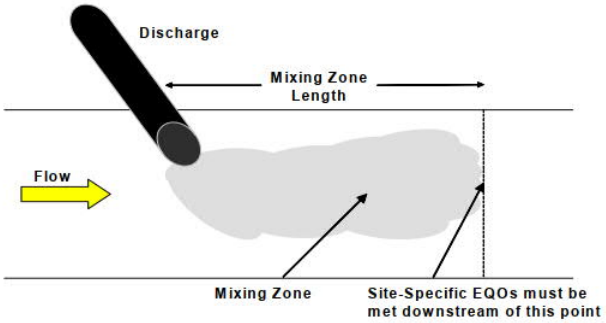


Figure 6-1: Conceptual Diagram of a Mixing Zone (CCME 2008)

The mixing process can be characterized into two distinct phases: near-field and far-field. Near-field mixing occurs at the outfall and is influenced by the characteristics of the outfall (e.g., pipe size, diffusers, etc.). Far-field mixing mechanisms are dominated by the ambient receiving water conditions, particularly current velocity and density. The main emphasis of CORMIX is on the near-field mixing behaviour; however, CORMIX can simulate plume dimensions at larger distances in the far-field zone provided the flow is not highly irregular.

Within the mixing zone, EQOs may be exceeded but acutely toxic conditions are not permitted unless it is determined that un-ionized ammonia is the cause of toxicity. Outside of the mixing zone, EQOs must be achieved. The effluent is also required to be non-chronically toxic outside of the mixing zone. The allocation of a mixing zone varies from one substance to another, degradable substances are allowed to mix in a portion of the receiving water whereas toxic, persistent, and bio-accumulative substances are typically not allowed in a mixing zone.

The following are general criteria for allocating mixing zones:

- The dimensions of a mixing zone should be restricted to avoid adverse effects on the designated uses of the receiving water system (i.e., the mixing zone should be as small as possible);
- Conditions outside of the mixing zone should be sufficient to support all of the designated uses of the receiving water system;
- A zone of passage for mobile aquatic organisms must be maintained;
- Placement of mixing zones must not block migration into tributaries;
- Changes to the nutrient status of the water body as a result of an effluent discharge should be avoided; eutrophication or toxic blooms of algae are unacceptable impacts;
- Mixing zones for adjacent wastewater discharges should not overlap; and
- Adverse effects on the aesthetic qualities of the receiving water system (e.g., odour, colour, scum, oil, floating debris) should be avoided (CCME 1996).

The limits of the mixing zone may be defined for the following three categories of aquatic environments based on their physical characteristics:

- Streams and rivers;

- Lakes, reservoirs, and enclosed bays; and
- Estuarine and marine waters.

Based on these general guidelines, mixing zone extents must be defined on a case-by-case basis that account for local conditions. It may also be based on arbitrary mixing zone limits for open water discharges (e.g., a 100 m (ACWWA 2006) radius from the outfall). The shoreline of the Pleasant Street Treatment Facility spans over 100 m. For this analysis, a mixing zone of 100 m was used as the plume is expected to be contained within the limits of the Pleasant Street Treatment Facility property boundary.

6.3 Modelling Approach and Inputs

The CORMIX model was used to estimate dilution ratios at the edge of the mixing zone. Table 6-1 provides the input parameters used in the model and the source of the value.

Table 6-1: Summary of CORMIX Input Parameters

Parameter	Units	Scenario 1 Value Point Source	Scenario 2 Value Channel	Source
Effluent				
Flow	m^3/s	0.0012		Maximum daily effluent volume of 100 m^3
Density	kg/m^3	1,015		Assumed density
Ambient				
Average Depth	m	15.5		Schematized bounded cross section
Velocity	m/s	0.014		Estimated tidal range
Width	m	715		Schematized bounded cross section
Density	kg/m^3	1,022		Estimated summer density (15°, 30 ppt)
Wind Speed	m/s	4.12		Average annual hourly mean (historic)
Discharge				
Nearest Bank (Right or Left)	n/a	Left		Visual Inspection on map
Distance to Nearest Bank	m	0	0	Assumed
Vertical Angle	° deg	-0.57	0	Assumed
Horizontal Angle[1]	° deg	260		Assumed
Port Diameter	mm	200	-	Assumed discharge pipe
Channel Dimensions	m x m	-	1.5 x 1.5	Assumed spread from discharge pipe to water surface
Port Height Above Surface	m	7.33	0	Assumed

[1] Measured counter clockwise from the direction of ambient flow.

6.4 Simulated Mixing Model Results

The CORMIX mixing model was used in conjunction with desktop calculations to estimate the area of the ambient water that is available for mixing and determine the dilution ratio at the edge of the mixing zone.

To approximate the ambient flow that is available for mixing, a reasonable and realistic allowance for the potential mixing zone area has been used. A potential mixing zone was selected considering the distance from the shore to the end of the regulatory mixing zone (i.e., 100 m (ACWWA 2006) radius from the outfall). A potential cross-sectional area contributing ambient flow to drive mixing was then calculated using the bathymetry from navigational chart data, this resulted in a cross-sectional area of 400 m^2. The ambient velocity of 0.014 m/s was used to represent steady-state conditions; therefore, the estimated ambient flow available for mixing is 5.6 m^3/s. The effluent flow rate used for this calculation is 0.0012 m^3/s. The ratio of ambient flow rate available for dilution to effluent flow rate, based on these assumptions, is 4,667:1. This ratio denotes there are 4,667 parts ambient flow and 1 part effluent flow for a total of 4,668 parts of flow. The limiting dilution ratio is therefore calculated to be 1:4,668 when fully mixed. The CORMIX mixing model was then used to determine the dilution at the edge of the mixing zone (100 m from shore). This was completed to verify if mixing at the edge of the mixing zone is less than the limiting dilution.

Scenario 1: Point

Initial simulation results suggest that the plume exhibits a weak cross flow due to the relatively low flow in the effluent in comparison to the ambient flow rate. The plume is simulated to attach to the left shore (in the direction of flow). Additionally, it was assumed that effluent density is less than ambient density. This assumption results in a positively buoyant plume which will tend to rise towards the surface of the channel. Simulation results also indicate the plume exhibits upstream intrusions. The flow classification for this scenario is IPV2, a classification tree can be found in Appendix E. The resulting dilution ratio simulated at the edge of the mixing zone is tabulated in Table 6-2.

Scenario 2: Channel
Initial simulation results suggest that the plume is simulated to attach to the left shore (in the direction of flow). Additionally, it was assumed that effluent density is less than ambient density. This assumption results in a positively buoyant plume which will tend to rise towards the surface of the channel. Simulation results also indicate the plume exhibits upstream intrusions and possible intrusion into the simulated discharge channel. The flow classification for this scenario is PL1, a classification tree can be found in Appendix E. The resulting dilution ratio simulated at the edge of the mixing zone is tabulated in Table 6-2.

Table 6-2: CORMIX **Dilution Ratio** Results

Scenario	Edge of Mixing Zone	Downstream Distance (m)	Plume Dimensions (m)	Dilution Ratio (1:X)
Scenario 1: Point Source	100 m from discharge point	100	Width: 61 Thickness: 2	1,584
Scenario 2: Channel	100 m from discharge point	100	Width: 67 Thickness: 1	754

The new discharge line is proposed to connect from the southwest corner of the existing building that will house the treatment equipment to the discharge location near the top of the protected (by armour stone) shoreline of the Halifax Harbour. A critical, yet reasonable and realistic assumption can be made that flow will discharges from the proposed pipe and will flow down the riprap shore as a channel flow and into the Halifax Harbour. For this analysis Scenario 2 was used as the proposed mixing regime and the calculated dilution ratios at the edge of the mixing zone of 754:1 was used for further analyses.

6.5 Sensitivity Analysis

A sensitivity analysis of the difference in effluent versus ambient densities was completed due to the possible variability of effluent parameters.

It is noteworthy, surface channel discharge (CORMIX3) assumes a positively buoyant discharge (i.e., density in the effluent is lower than the density in the ambient), therefore; negatively buoyant discharge sensitivity was simulated only in Scenario 1.

The results of the density sensitivity analysis for Scenario 1 and Scenario 2 are shown in Figure 6-2 and Figure 6-3, respectively.

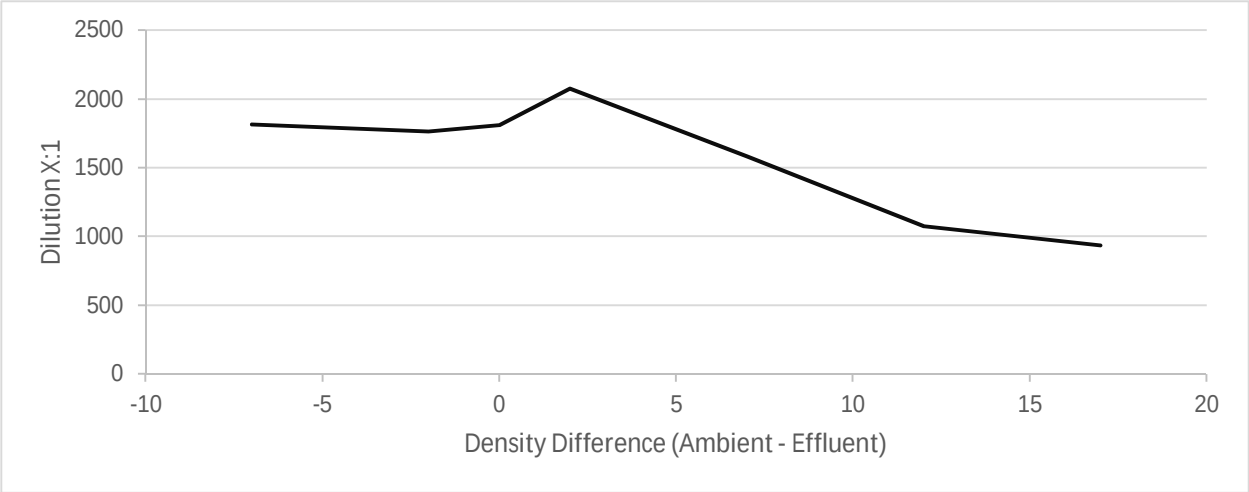


Figure 6-2: Scenario 1: Point Source **Density Sensitivity Analysis**

As shown in Figure 6-2, when the effluent density is greater than the ambient density (i.e., negative density difference) the resulting dilution ratio at the edge of the mixing zone is greater. Additionally, this will result in a negatively buoyant plume and the plume will tent to sink towards the bottom of the receiving water.

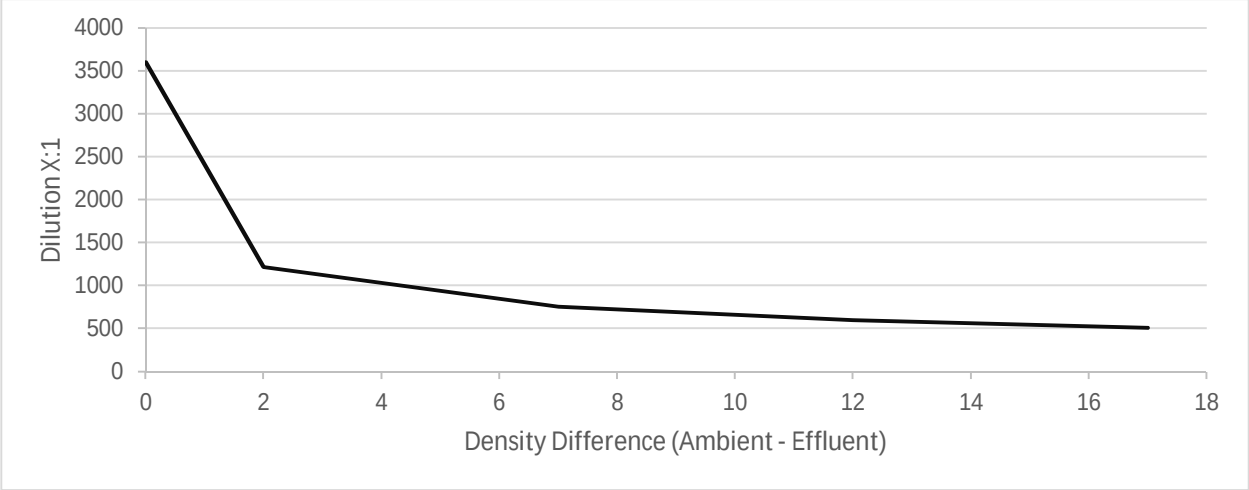


Figure 6-3**: Scenario 2: Channel Density Sensitivity Analysis**

Similarly, shown in Figure 6-3, when the effluent density is greater than the ambient density (i.e., negative density difference) the resulting dilution ratio at the edge of the mixing zone is greater.

It can be seen in both Figure 6-2 and Figure 6-3 a lower effluent density (i.e., greater positive density difference) result in a lower dilution ratio at the edge of the mixing zone. As a critical, yet "reasonable and realistic", mixing zone, a density different of 7 kg/m^3 was selected for this analysis.

7.0 Effluent Discharge Objectives

EDOs represent the effluent substance concentrations that will protect the receiving environment and its designated water uses. They describe the effluent quality necessary to allow the EQOs to be met at the edge of the mixing zone, in conditions where a mixing zone can be applied. Where effluent parameters have limits established by regulations, the EDOs are set as the more stringent of the regulated value or the calculated value.

The following equation was used to calculate EDOs specific to the Pleasant Street Treatment Facility.

$$EDO = (EQO \times s) - (C_b \times (s - 1))$$

Where:

EDO = Effluent Dilution Objective
EQO = Effluent Quality Objective
s = dilution ratio at the edge of the mixing zone
C_b = concentration in the receiving water

The EDOs established in this study are shown in Table F-1 of Appendix F.

Parameters in which EQO is equal to background, the dilution ratio has been set at 1, as per CCME 2008. This will result in the EDO calculated to be equal to the EQO. For example, shown in Table D-1, Nitrite (as N) has no identified environmental guideline. A background level of 0.0115 mg/L was determined in the background water, therefore; the EQO and EDO are set at 0.0115 mg/L. Alternatively, the environmental guideline for Copper shown in Table D-1 is 0.002 mg/L, background conditions were found to be higher, at 0.005 mg/L therefore; the EQO and EDO are set at 0.005 mg/L, as per CCME 2008.

EDO results that suggest approaching solubility limits have been reduced to values below the solubility limit (e.g mTPH set to 20 mg/L as per Atlantic RBCA solubility limits).

It is noteworthy that the discharge cannot be acutely toxic at the end of pipe and will be monitored using the Microtox unit prior to discharge.

8.0 Operational Monitoring

During initial treatment system start-up and system optimization during the commissioning phase, the treated water will be monitored using both internal testing as presented in Table 8.1 below and external accredited laboratories with analysis of parameters listed in Table A1 of Appendix A of this report. Once the performance of the treatment system has been confirmed during the commissioning phase (anticipated to be 3 to 6 months in duration) the treatment facility will continue to submit 10% of the treated water to external accredited laboratories but will move into operational monitoring for day to day operational activities using Table 8.1. Should operational monitoring indicate any unacceptable concentrations, treated water will not be released but will undergo additional testing to confirm results and additional treatment as required.

Table 8.1 – Operational Monitoring

Operational Testing Method	Parameter group	Timing	Detection capability	Comments
Microtox	Metals, PAHs, PHCs, VOCs, Gen. Chem, Nutrients,	Every run prior to discharge	Pass/Fail Toxicity	Parameter non-specific, and highly sensitive
Hach DR6000	Metals, Gen. Chem, Nutrients	Every run prior to discharge	Varies by parameter (ppm to ppb)	Performance specifications are provided in Appendix
GC 8610C model multi-detector • PID • FID • DELCD • ASD	PAHs, PHCs, VOCs	Every run prior to discharge	Varies by parameter (ppm to ppb)	Performance specifications are provided in Appendix
Accredited Laboratory surveillance monitoring	Metals, gen chem, nutrients, PAHs, PHCs, VOCs	10% frequency for treatment performance confirmation	Varies by parameter (ppm to ppb)	See Table D1 Addendum for EDOs. Parameters specific to type of water being treated (e.g., PHCs for PHC impacted water)

9.0 Conclusion & Recommendations

This Receiving Water Study has been completed to identify proposed Effluent Quality Objectives (EQOs) and estimate Effluent Discharge Objectives (EDOs) for the protection of aquatic life in the receiving water environment. The Cornell Mixing Zone Expert System (CORMIX) mixing model was used to predict the mixing regime and to calculate dilution ratios at the edge of the mixing zone.

A mixing zone of 100 m radius from the outfall was used, as the plume is expected to be contained within the limits of the Pleasant Street Treatment Facility property boundary.

Two model scenarios were used to approximate the proposed mixing conditions:

- Scenario 1: Point Source - assuming the effluent is discharging directly at the surface as a jet from the pipe; and
- Scenario 2: Channel - assuming the flow is discharging overland from the shore as a small channel entering the receiving water.

As the effluent discharge pipe is proposed to discharge near the top of the protected (by armour stone) shoreline of the Halifax Harbour, a conservative assumption was made that flow will discharge from the proposed pipe and will flow down the riprap shore as a channel flow and into the Halifax Harbour. For this analysis Scenario 2 was used as the proposed mixing regime and the calculated dilution ratio at the edge of the mixing zone was estimated to be 754:1.

Based on this assumed dilution ratio at the edge of the mixing zone, EDOs were established for the parameters of concern identified for the Pleasant Street Waste Oil Recycling and Water Treatment Facility.

As described in Section 8.0, it is recommended that a compliance water quality monitoring program be carried out as part of both the commissioning phase (including initial start-up and system optimization) and the routine operational phase of the project. CEPA's list of Toxic Substances (Schedule 1) should generally inform the list of substances to be analyzed during the commissioning phase of the Project. Following, the commissioning phase and for longer term operational monitoring, the combination of real time (in-house) analysis, with some external accredited laboratory confirmation (e.g. 5% of samples) for QA/QC purposes would be appropriate. The in house testing will be more targeted for individual parameters (i.e., all CEPA list parameter would not require testing, all metals will not be analysed, nor would all PAHs, nor all VOCs, etc.) as the broad spectrum (non-contaminant specific) Microtox testing being completed in house combined with the validation testing completed both internally and with confirmation and broad parameter testing externally justify the use of more selective indicator parameter testing in house.

Appendix A

Substances of Potential Concern

A- 1: Site Specific List of Substance of Potential Concern

	SOPC	CCME (Y/N)
Inorganic Parameters	Arsenic	Y
	Cadmium	Y
	Chromium (hexavalent)	Y
	Chromium (total)	Y
	Cobalt	Y
	Copper	Y
	Lead	Y
	Mercury (total)	Y
	Nickel	Y
	Selenium	Y
	Vanadium	Y
	Zinc	Y
General Chemistry Parameters	Total Ammonia Nitrogen (Total NH3-N)	Y
	Carbonaceous Biochemical Oxygen Demand (CBOD5)	Y
	Chloride	N*
	Fluoride	Y
	Nitrate (as N)	Y
	Nitrite (as N)	N*
	Total Phosphorus (TP)	Y
	pH	Y
	Sodium	N*
	Sulphates (background)	N*
	Total Suspended Solids (TSS)	Y
	Total Dissolved Solids (TDS)	N*
Petroleum Hydrocarbons (PHC) Parameters	Benzene	Y
	Toluene	Y
	Ethylbenzene	Y
	Xylene	Y
	Modified TPH (Gas)	N*
	Modified TPH (Fuel)	N*
	Modified TPH (Lube)	N*
Polycyclic Aromatic Hydrocarbons (PAH) Parameters Non-Carcinogenic PAH Compounds	Naphthalene	Y
	1 - Methylnaphthalene	N*
	2 - Methylnaphthalene	N*
	Acenaphthene	Y
	Anthracene	Y
	Fluoranthene	Y
	Fluorene	Y
	Phenanthrene	Y
	Pyrene	Y
Carcinogenic PAH Compounds	Benzo(a)pyrene	Y
	Chrysene	Y
Limited Volatile Organic Compound (VOC) Parameters	Tetrachloroethylene	Y
	Trichloroethylene	Y
Other Parameters	Ethylene Glycol	N*
	Propylene Glycol	N*
	Phenol (background)	N*

* Supplemental substances of potential concern

Appendix B

Underwater Benthic Study

August 2, 2022

Envirosoil Limited, The Municipal Group of Companies
927 Rocky Lake Drive
Bedford Nova Scotia
B4A 3Z2

Attention: Jerry Scott

RE: Underwater Benthic Habitat Survey Cherubini Wharf

DILLON CONSULTING

137 Chain Lake Drive
Suite 100
Halifax
Nova Scotia
Canada
B3S 1B3
Telephone
902.4450.4000
Fax
902.450.2008

Introduction

Dillon Consulting Limited (Dillon) is pleased to provide the following letter report summarizing the results of an underwater benthic habitat survey (UBHS) in Halifax Harbour adjacent to the Cherubini Wharf in Dartmouth, Nova Scotia.

Dillon was retained by Envirosoil to undertake the UBHS in anticipation of a receiving water study as partial fulfilment of the regulatory requirements related to permitting for the proposed water treatment facility.

Scope of Work

In order to apply for the necessary regulatory permits to construct the proposed wastewater treatment plant, an UBHS is required to characterize the benthic habitat within the proposed project footprint (refer to Figure 1, attached).

UBHS Methodology

On December 10th, 2020, qualitative and quantitative observations were obtained from the area of Halifax Harbour immediately north of the Cherubini Wharf in Dartmouth using video survey techniques to map substrate type and document macrofaunal and macrofloral species presence and abundance. Dominion Diving of Dartmouth, NS, was contracted by Dillon to perform the diving and video services required for the UBHS. A Dillon field personnel was on site to assist and direct the divers throughout the field program and to document the findings and diver observations.

A total of five lead-line transects marked at every five meters (m) were laid on the harbour bottom. The survey was divided into five transects, which ranged in length from 70m to 210m (Figure 2). The transect locations were visually referenced in the field and coordinates were recorded using a handheld Global Positioning System

(GPS) to mark the start and end points of each transect. The coordinates are listed below in Table 1.

Table 1 – UBHS Transect Coordinates, 750 Pleasant Street

Transect	Start (UTM NAD 83 Zone 20)		End (UTM NAD 83 Zone 20)	
	Easting	Northing	Easting	Northing
T-1	-63.52924	44.63441	-63.52693	44.63284
T-2	-63.52863	44.63443	-63.52655	44.63310
T-3	-63.52809	44.63443	-63.52630	44.63331
T-4	-63.52770	44.63434	-63.52843	44.63386
T-5	-63.52799	44.63442	-63.52864	44.63401

A Canadian Standards Association (CSA)-certified diver using SCUBA was equipped with an underwater video camera and swam the length of each transect to record the substrate, macrofloral and macrofaunal communities along these transects. Where possible, the underwater video surveillance covered approximately 1m on either side of the transect line. Seabed characterization included field observations made by the field crew and a review of the video footage by a Dillon biologist. Observations were recorded for every 10m segment along each transect. Specific observations made by Dillon field personnel during the UBHS included the following:

- Interpretation of site specific information on the substrate type and marine macrofaunal/faunal species present;
- Detailed descriptions of biological presence (especially fish) and/or habitat that are related to commercial, recreational or indigenous fisheries;
- Examination of the proposed project area for shellfish presence and abundance, including siphon holes; and,
- General characterization and delineation of substrate types (i.e., rippled sand/rock/gravel) and a general characterization (i.e., what percentage of area is sand).

UNDERWATER BENTHIC HABITAT SURVEY RESULTS

The results of the transect surveys (i.e., Transect Nos. 1 to 5) are presented in Table 2 (attached). These detailed results include:

- visual determination of substrate type;
- macrofaunal species identification and abundance; and
- macrofloral species identification and percent coverage.

Substrate: According to the video surveillance, the predominant substrate type along each of the five transects (Transect Nos. 1 (T-1) to 5 (T-5)) was sand.

Macrofauna: During the UBHS, macrofaunal species identification and enumeration was divided into four categories in order to characterize the observed abundances. These categories are as follows:

i. Abundant ("A") – Numerous (not quantifiable) observations made throughout the 10m segment;
ii. Common ("C") – Numerous (not quantifiable) observations made intermittently along the 10m segment;
iii. Occasional ("O") – Quantifiable (number of individuals) observations made intermittently along the 10m segment; and,
iv. Uncommon ("U") – Quantifiable (number of individuals) observations made infrequently along the 10m segment.

Transect 1 (T-1): Macrofaunal life was observed intermittently along the 210m length of T-1. Macrofaunal life noted along T-1 included:

- Starfish *(Asteroidea)*: Occasional occurrence (52) along the transect line;
- Atlantic rock crab *(Cancer irroratus)*: Occasional occurrence (12) along the transect line;
- Mussel *(Mytilus edulis)*: Common occurrence along the 20-30m segment;
- Scallop *(Placopecten magellanicus)*: Uncommon occurrence (2) along the 20-30m and 30-40m segments;
- Sea anemone *(Actiniaria)*: Uncommon occurrence (4) along the 20-30m, 30-40m, 50-60m, and 60-70m segments;
- Hermit crab *(Paguroidea)*: Uncommon occurrence (1) along the 170-180m segment; and,
- Sea urchin *(Echinoidea)*: Uncommon occurrence (2) along the 190-200m segment.

An abundant occurrence of small shells was present along the 170-180m segment.

Transect 2 (T-2): Macrofaunal life was observed intermittently along the 190m length of T-2. Macrofaunal life noted along T-2 included:

- Starfish *(Asteroidea)*: Occasional occurrence (49) along the transect line;
- Atlantic rock crab *(Cancer irroratus)*: Occasional occurrence (12) along the transect line;
- Mussel *(Mytilus edulis)*: Common occurrence along the 10-20m and 30-40m segments; and,
- Sea urchin *(Echinoidea)*: Uncommon occurrence (2) along the 170-180m segment.

An abundant occurrence of small shells was present along the 160-170m and 170-180m segments.

Transect 3 (T-3): Macrofaunal life was observed intermittently along the 190m length of T-3. Macrofaunal life noted along T-3 included:

- Starfish *(Asteroidea)*: Occasional occurrence (11) along the transect line;
- Atlantic rock crab *(Cancer irroratus)*: Occasional occurrence (38) along the transect line;
- Mussel *(Mytilus edulis)*: Uncommon occurrence (2) along the 170-180m segment;
- Shrimp *(Litopenaeus setiferus)*: Abundant occurrence along the 110-120m and 130-140m segments; and,
- Hermit crab *(Paguroidea)*: Uncommon occurrence (6) along the 0-10m, 30-40m, 40-50m, and 50-60m segments.

An abundant occurrence of small shells was present along 14 segments.

Transect 4 (T-4): Macrofaunal life was observed intermittently along the 80m length of T-4. Macrofaunal life noted along T-4 included:

- Starfish *(Asteroidea)*: Occasional occurrence (15) along the 20-30m, 30-40m, and 40-50m segments;
- Atlantic rock crab *(Cancer irroratus)*: Uncommon occurrence (4) along the 30-40m, 40-50, and 50-60m segments;
- Mussel *(Mytilus edulis)*: Common occurrence along the 60-70m segment; and,
- Shrimp *(Litopenaeus setiferus)*: Abundant occurrence along the 10-20m and 30-40m segments.

An abundant occurrence of small shells was present along the 20-30m, 40-50m, 50-60m, 60-70m, and 70-80m segments.

Transect 5 (T-5): Macrofaunal life was observed intermittently along the 70m length of T-5. Macrofaunal life noted along T-5 included:

- Starfish *(Asteroidea)*: Uncommon occurrence (4) along the 0-10m, 10-20m, and 20-30m, segments;
- Atlantic rock crab *(Cancer irroratus)*: Occasional occurrence (6) along the 0-10m, 10-20m, 40-50m, and 60-70m segments;
- Mussel *(Mytilus edulis)*: Uncommon occurrence (1) along the 60-70m segment and common occurrence along the 50-60m and 60-70m segments;
- Shrimp *(Litopenaeus setiferus)*: Abundant occurrence along the 0-10m and 30-40m segments; and,
- Barnacles *(Cirripedia)*: Abundant occurrence along the 60-70m segment.

Small shells were abundant along each of the transect line segments.

Macroflora: Macrofloral life was observed along each of the transects, as further described below and in Table 2 (attached). A summary of the macrofloral species for each transect is presented below.

Transect 1 (T-1): Macrofloral life was observed intermittently along the 210m length of T-1. Macrofloral life noted along T-1 included:

- Kelp (*Laminariales)*: Observed along the 10-20m, 20-30m, 40-50m, 50-60, 100-110m and 160-170m segments.

Macrofloral debris was noted along the transect line, with coverage ranging from 10-30% from 0-190m. The remaining 20m of the transect line had 80% coverage.

Transect 2 (T-2): Macrofloral life was noted intermittently along the 190m length of T-2. Macrofloral life noted along T-2 included:

- Kelp (*Laminariales)*: Observed along the 10-20m, 20-30m, 30-40m, 60-70m, and 90-100m segments.

Macrofloral debris was noted along the transect line, with coverage ranging from 10-30% from 0-150m. There was 90-95% coverage from 150-180m, and the remaining 10m had 10% coverage.

Transect 3 (T-3): Macrofloral life was observed intermittently along the 190m length of T-3. Macrofloral life noted along T-3 included:

- Kelp (*Laminariales)*: Observed along the 0-10m, 20-30m, 50-60m, and 130-140m segments.

Macrofloral debris was noted along the transect line, with coverage ranging from 5-20% from 0-170m. The remaining 20m had 70% coverage.

Transect 4 (T-4): There was no macrofloral life observed along the 80m length of T-4.

Macrofloral debris was noted along the transect line. Coverage over the first 30m ranged from 5-10%. The following 40m had coverage ranging from 60-85%, while the final 10m segment had 10% coverage.
Transect 5 (T-5): Macrofloral life was observed intermittently along the 70m length of T-5. Macrofloral life noted along T-5 included:

- Kelp (*Laminariales)*: Observed along the 0-10m segment.

Macrofloral debris was noted along the transect line, with the first and last 10m having 10% coverage. The 50m in the middle of the transect line had 70% coverage.

Quality Assurance/Quality Control

The UBHS field component was conducted by a CSA certified diver using SCUBA, and directed by a Dillon biologist experienced with environmental field data and sample collection. During the UBHS, Dillon was responsible for ensuring that standard

operating procedures, best management practices and health and safety measures were maintained throughout the field survey.

Summary

Characterization of the Cherubini Wharf site, Dartmouth, NS was completed through the combination of visual field observations and underwater video survey techniques. The dominant substrate type among each transect line was sand. There was a high abundance of macrofaunal life within the study area. Organisms encountered within the study area included starfish *(Asteroidea)*, Atlantic rock crabs *(Cancer irroratus)*, mussels *(Mytilus edulis)*, scallops *(Placopecten magellanicus)*, sea anemone *(Actiniaria)*, hermit crabs *(Paguroidea)*, sea urchins *(Echinoidea)*, shrimp *(Litopenaeus setiferus)*, and barnacles *(Cirripedia).* The macrofloral life encountered was very minimal and consisted of Kelp (*Laminaria saccharina)*. Macrofloral debris was noted along each transect.

Closure

This report was prepared exclusively for the purposes, project, and site location(s) outlined in the report. The report is based on information provided to, or obtained by Dillon Consulting Limited ("Dillon") as indicated in the report, and applies solely to site conditions existing at the time of the site investigation(s). Although a reasonable investigation was conducted by Dillon, Dillon's investigation was by no means exhaustive and cannot be construed as a certification of the absence of any flora or fauna from the site. Rather, Dillon's report represents a reasonable review of available information within an agreed work scope, schedule, and budget. It is therefore possible that currently unrecognized flora or fauna may exist at the site. Further review and updating of the report may be required as local and site conditions, and the regulatory and planning frameworks, change over time.

This report was prepared by Dillon for the sole benefit of Envirosoil Limited. The material in it reflects Dillon’s best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report was prepared by Rebecca Acker, B.Sc. The report was reviewed by Paul Koke, B.A., M.Eng., P.Eng.

We trust this report meets your current requirements. If you have any questions or comments, please contact the undersigned.

Yours sincerely,

DILLON CONSULTING LIMITED

Paul Koke, M.A., CISEC
Project Manager

PEK:ra:scm:sr
Attachments

Our file: 19-1742-5000

Site Photographs

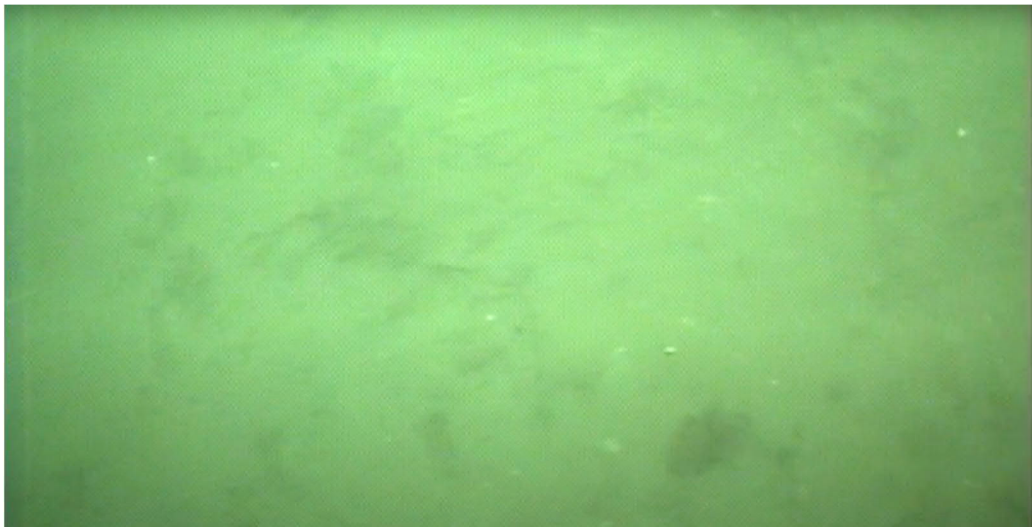


Photo 1: Typical sand substrate – Transect No. 1: 25 m. December 10, 2020.

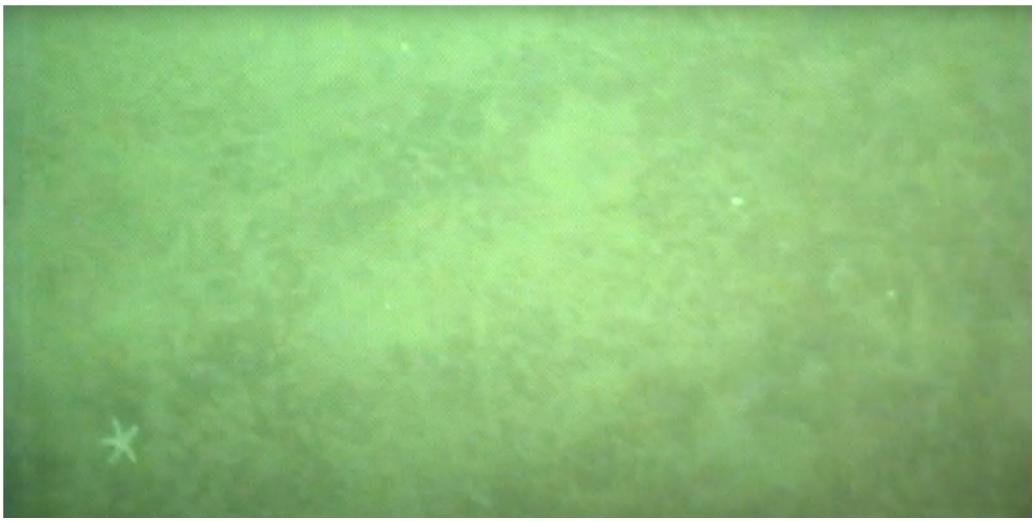


Photo 2: Typical sand substrate, macrofloral debris, and a Starfish *(Asteroidea)* – Transect No. 1: 135 m. December 10, 2020.

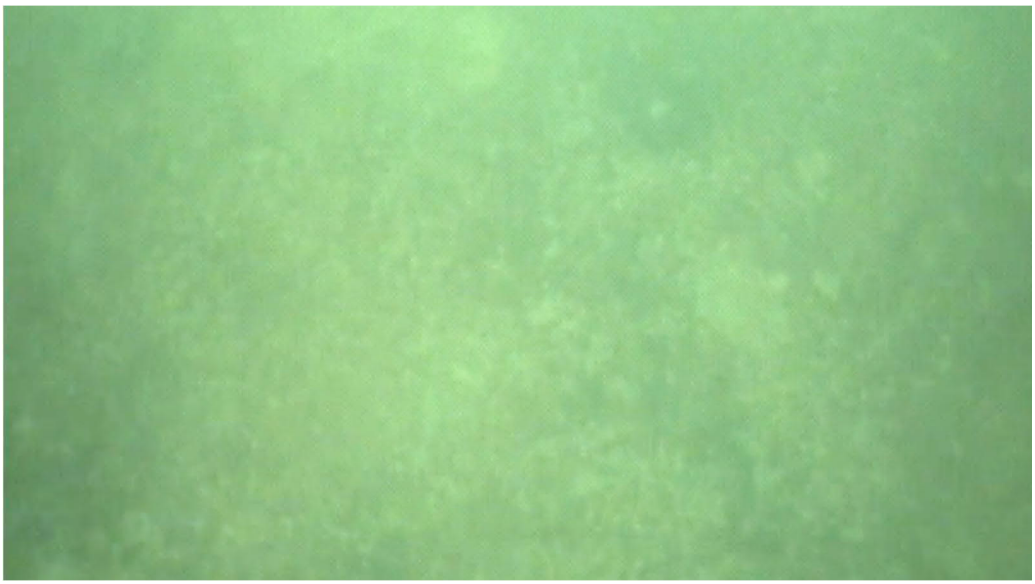


Photo 3: Typical sand substrate – Transect No. 2: 105 m. December 20, 2020.

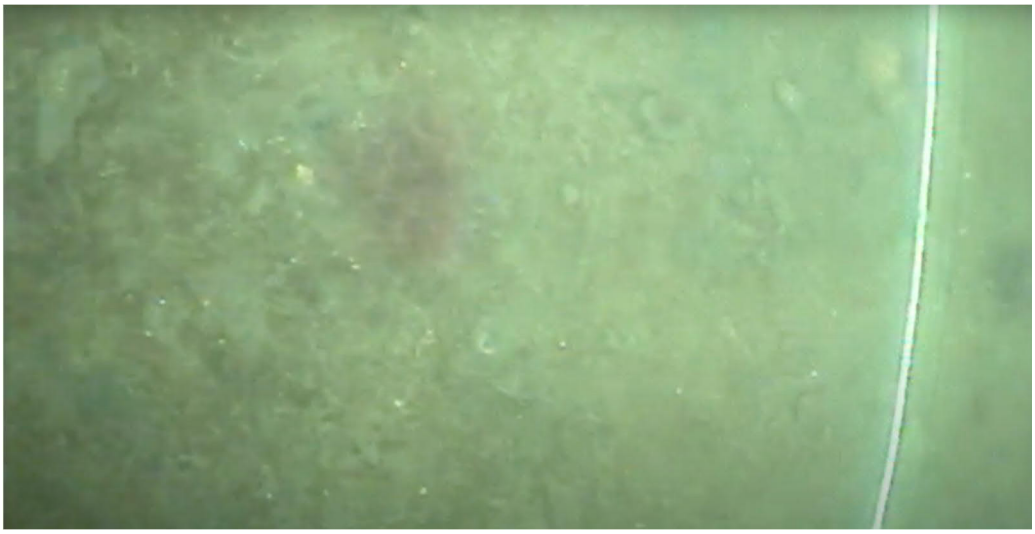


Photo 4: Typical sand substrate with macrofloral life
– Transect No. 3: 45 m. December 20, 2020.

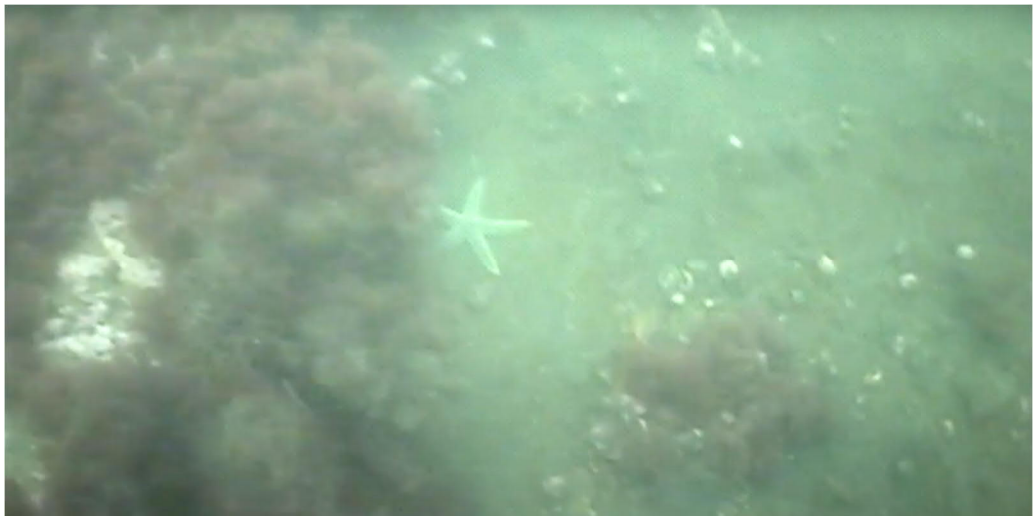


Photo 5: Macrofaunal life Starfish *(Asteroidea)* – Transect No. 4: 35m. December 10, 2020.

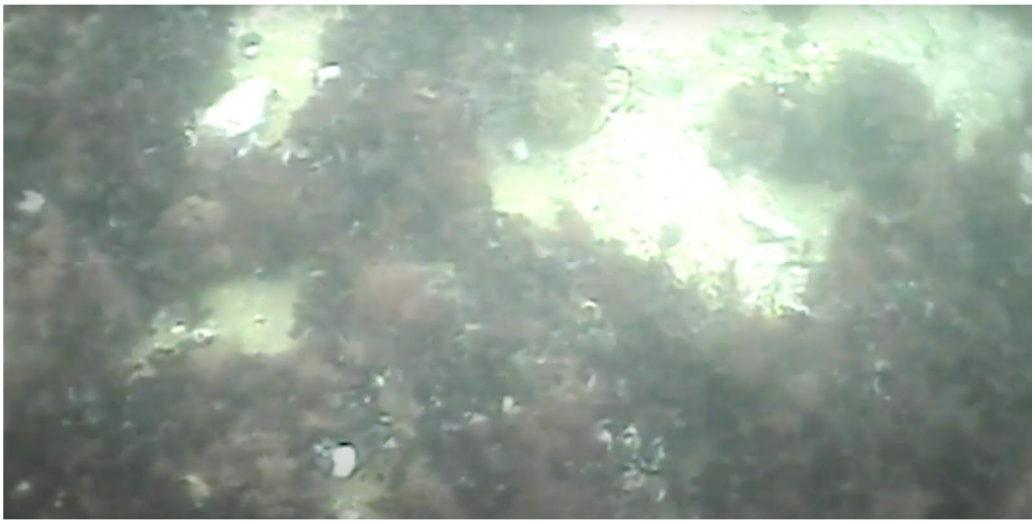


Photo 6: Macrofloral life – Transect No. 5: 35 m. December 20, 2020.

UBHS Results for Transects 1 to 5

UBHS Results for Transects 1 to 5, 750 Pleasant Street.

Transect 3						
Transect Section (m)	Sediment Cover (%)	Cover by Macroflora (%)	Macroflora Observed	Macrofauna Observed	Number of Organisms	Comments
0-10	90% Sand	10%	Macrofloral debris, Kelp (Laminariales)	Atlantic rock crab (Cancer irroratus) , Hermit Crab *(Paguroidea)*	7	Sandy silt substrate with scattering of macroalgae debris and kelp (Laminariales) . 4 Atlantic rock crabs (Cancer irroratus) , 2 hermit crabs (Paguroidea) , and some garbage were observed.
10-20	95% Sand	5%	Macrofloral debris	Atlantic rock crab (Cancer irroratus)	4	Sandy silt substrate with scattering of macroalgae debris. 4 Atlantic rock crabs (Cancer irroratus) were observed.
20-30	90% Sand	10%	Macrofloral debris, Kelp (Laminariales)	Atlantic rock crab (Cancer irroratus) , Starfish (Asteroidea)	2	Sandy silt substrate with scattering of macroalgae debris and kelp (Laminariales) . Numerous small shells, 1 Atlantic rock crab (Cancer irroratus) , 1 starfish (Asteroidea) , and some garbage were observed.
30-40	90% Sand	10%	Macrofloral debris	Atlantic rock crab (Cancer irroratus) , Hermit Crab *(Paguroidea)*	3	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells, 2 Atlantic rock crabs (Cancer irroratus) , 1 hermit crab (Paguroidea) , and 3 tires covered in marine growth were observed.
40-50	90% Sand	10%	Macrofloral debris	Atlantic rock crab (Cancer irroratus) , Hermit Crab *(Paguroidea)* , Starfish (Asteroidea)	9	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells, 7 Atlantic rock crabs (Cancer irroratus) , 1 hermit crab (Paguroidea) , 1 starfish (Asteroidea) , and 1 tire covered in marine growth were observed.
50-60	90% Sand	10%	Macrofloral debris, Kelp (Laminariales)	Atlantic rock crab (Cancer irroratus) , Hermit Crab *(Paguroidea)*	6	Sandy silt substrate with scattering of macroalgae debris and kelp (Laminariales) . 4 Atlantic rock crabs (Cancer irroratus) and 2 hermit crabs (Paguroidea) were observed. Poor visibility.
60-70	90% Sand	10%	Macrofloral debris	Starfish (Asteroidea) , Atlantic rock crab (Cancer irroratus)	3	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells, 2 Atlantic rock crabs (Cancer irroratus) , and 1 starfish (Asteroidea) were observed. Poor visibility.
70-80	90% Sand	10%	Macrofloral debris	Atlantic rock crab (Cancer irroratus)	3	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells and 3 Atlantic rock crabs (Cancer irroratus) were observed. Poor visibility.
80-90	90% Sand	10%	Macrofloral debris	Atlantic rock crab (Cancer irroratus) , Starfish (Asteroidea)	3	Sandy silt substrate with scattering of macroalgae debris. 2 Atlantic rock crabs (Cancer irroratus) and 1 starfish (Asteroidea) were observed. Poor visibility.
90-100	90% Sand	10%	Macrofloral debris	Starfish (Asteroidea) , Atlantic rock crab (Cancer irroratus)	4	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells, 3 Atlantic rock crabs (Cancer irroratus) , and 1 starfish (Asteroidea) were observed. Poor visibility.
100-110	90% Sand	10%	Macrofloral debris	Atlantic rock crab, Starfish (Asteroidea), Shrimp (Litopenaeus setiferus)	4	Sandy silt substrate with scattering of macroalgae debris. Numerous small shrimp (Litopenaeus setiferus) , 2 Atlantic rock crabs (Cancer irroratus) , 2 starfish (Asteroidea) , and garbage were observed. Poor visibility.
110-120	90% Sand	10%	Macrofloral debris	Starfish (Asteroidea) , Atlantic rock crab (Cancer irroratus)	2	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells, 1 Atlantic rock crab (Cancer irroratus) , and 1 starfish (Asteroidea) were observed. Poor visibility.

UBHS Results for Transects 1 to 5, 750 Pleasant Street.

Transect 3						
Transect Section (m)	Sediment Cover (%)	Cover by Macroflora (%)	Macroflora Observed	Macrofauna Observed	Number of Organisms	Comments
120-130	90% Sand	10%	Macrofloral debris	Starfish (Asteroidea)	2	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells and 2 starfish (Asteroidea) were observed. Poor visibility.
130-140	90% Sand	10%	Macrofloral debris, Kelp (Laminariales)	Starfish (Asteroidea) , Atlantic rock crab (Cancer irroratus), Shrimp (Litopenaeus setiferus)	2	Sandy silt substrate with scattering of macroalgae debris and kelp (Laminariales) . Numerous small shells and shrimp (Litopenaeus setiferus) , 1 starfish (Asteroidea) , and 1 Atlantic rock crab (Cancer irroratus) were observed. Poor visibility.
140-150	80% Sand	20%	Macrofloral debris	Atlantic rock crab (Cancer irroratus) , Starfish (Asteroidea)	4	Sandy silt substrate with scattering of macroalgae debris. Numerous small shells, 2 Atlantic rock crabs (Cancer irroratus) , and 2 starfish (Asteroidea) were observed.
150-160	80% Sand	20%	Macrofloral debris	---	---	Sandy silt substrate with areas of dense macroalgae debris. Numerous small shells were observed.
160-170	80% Sand	20%	Macrofloral debris	---	---	Sandy silt substrate with areas of dense macroalgae debris. Numerous small shells were observed.
170-180	30% Sand	70%	Macrofloral debris	Mussel (Mytilus edulis)	2	Sandy silt substrate with areas of dense macroalgae debris. Numerous rocks and small shells were observed, along with 2 mussel shells (Mytilus edulis) .
180-190	30% Sand	70%	Macrofloral debris	---	---	Sandy silt substrate with areas of dense macroalgae debris. Numerous small shells and rocks were observed.

Figures

Envirosoil Limited

Waste Oil Recycling and Water Treatment Facility (Dartmouth, NS)

Site Location

Figure 1

Site Location

MAP DRAWING INFORMATION:
DATA PROVIDED BY CanVec, ESRI

MAP CREATED BY: SCM
MAP CHECKED BY: PEK
MAP PROJECTION: NAD 1983 UTM Zone 22N

DILLON CONSULTING

0 0.75 1.5 3
Kilometres

PROJECT: 19-1482 STATUS: FINAL Date: 2022-08-03

Envirosoil Limted
Proposed Pleasant Street Treatment Facility (Dartmouth, NS)

Dive Transects
Figure 2

Transects
Approximate Adjacent Parcels

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY CanVec, ESRI

MAP CREATED BY: SCM
MAP CHECKED BY: PEK
MAP PROJECTION: NAD 1983 UTM Zone 22N

N
W E
S

0 12.5 25 50
Meters

PROJECT: 19-1742 STATUS: FINAL Date: 2022-08-03

Appendix C

Background Water Quality Testing

C- 1: Summary of Sampled Data - Halifax Harbour

	SOPC	Unit	Q1	Q2	Avg
Inorganic Parameters	Arsenic	mg/L	<0.01	<0.01	0.01
	Cadmium	mg/L	<0.0001	<0.0001	0.0001
	Chromium (hexavalent)	mg/L	-	-	-
	Chromium (total)	mg/L	<0.01	<0.01	0.01
	Cobalt	mg/L	<0.004	<0.004	0.004
	Copper	mg/L	<0.005	<0.005	0.005
	Lead	mg/L	<0.005	<0.005	0.005
	Mercury (total)	mg/L	<0.000013	<0.000013	0.000013
	Nickel	mg/L	<0.02	<0.02	0.02
	Selenium	mg/L	<0.005	<0.005	0.005
	Vanadium	mg/L	<0.02	<0.02	0.02
	Zinc	mg/L	<0.05	<0.05	0.05
General Chemistry Parameters	Total Ammonia Nitrogen (Total NH3-N)	mg/L	0.096	0.076	0.086
	Carbonaceous Biochemical Oxygen Demand (CBOD5)	mg/L	2.8	<5.0	3.9
	Chloride	mg/L	-	-	-
	Fluoride	mg/L	0.51	0.6	0.555
	Nitrate (as N)	mg/L	<0.050	<0.050	0.05
	Nitrite (as N)	mg/L	<0.010	0.013	0.0115
	Total Phosphorus (TP)	mg/L	0.032	0.02	0.026
	pH	Units	7.85	8.04	7.945
	Sodium	mg/L	-	8800	8800
	Sulphates (background)	mg/L	-	-	-
	Total Suspended Solids (TSS)	mg/L	8	6	7
	Total Dissolved Solids (TDS)	mg/L	-	-	-
Petroleum Hydrocarbons (PHC) Parameters	Benzene	mg/L	-	-	-
	Toluene	mg/L	-	-	-
	Ethylbenzene	mg/L	-	-	-
	Xylene	mg/L	-	-	-
	Modified TPH (Gas)	mg/L	-	-	-
	Modified TPH (Fuel)	mg/L	-	-	-
	Modified TPH (Lube)	mg/L	-	-	-
Polycyclic Aromatic Hydrocarbons (PAH) Parameters Non-Carcinogenic PAH Compounds	Naphthalene	mg/L	-	-	-
	1 - Methylnaphthalene	mg/L	<0.00005	<0.00005	0.00005
	2 - Methylnaphthalene	mg/L	<0.00005	<0.00005	0.00005
	Acenaphthene	mg/L	<0.00001	<0.00001	0.00001
	Anthracene	mg/L	<0.00001	<0.00001	0.00001
	Fluoranthene	mg/L	<0.00001	<0.00001	0.00001
	Fluorene	mg/L	<0.00001	<0.00001	0.00001
	Phenanthrene	mg/L	<0.00001	0.000017	1.35E-05
	Pyrene	mg/L	<0.00001	<0.00001	0.00001
Carcinogenic PAH Compounds	Benzo(a)pyrene	mg/L	-	-	-
	Chrysene	mg/L	-	-	-
Limited Volatile Organic Compound (VOC) Parameters	Tetrachloroethylene	mg/L	<0.001	<0.001	0.001
	Trichloroethylene	mg/L	<0.001	<0.001	0.001
Other Parameters	Ethylene Glycol	mg/L	-	-	-
	Propylene Glycol	mg/L	-	-	-
	Phenol (background)	mg/L	-	-	-

Q1 Raw Data Results

Your Project #: 191742
Your C.O.C. #: 872697-01-01

Attention: Julie Ellsworth

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/04/14
Report #: R7085825
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C286274
Received: 2022/04/01, 15:49

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Benzo(b/j)fluoranthene Sum (water)	1	N/A	2022/04/06	N/A	Auto Calc.
Residual Chlorine, Total (2)	1	N/A	2022/04/01	ATL SOP 00038	HACH 8167 10th ed. m
Chemical Oxygen Demand (COD)	1	2022/04/06	2022/04/07	ATL SOP 00042	SM 23 5220D m
Acid Extractables by GC/MS (1)	1	2022/04/03	2022/04/11	CAM SOP-00332	EPA 8270 m
Total Cyanide (1)	1	2022/04/06	2022/04/06	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	N/A	2022/04/08	ATL SOP 00043	SM 23 4500-F- C m
* Carbonaceous BOD (3)	1	2022/04/06	2022/04/11	ATL SOP 00041	SM 23 5210B m
Mercury - Total (CVAA,LL)	1	2022/04/11	2022/04/11	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	1	2022/04/05	2022/04/05	ATL SOP 00058	EPA 6020B R2 m
Nitrogen Ammonia - water	1	N/A	2022/04/11	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	1	N/A	2022/04/12	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	1	N/A	2022/04/12	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	1	N/A	2022/04/12	ATL SOP 00018	ASTM D3867-16
OC Pesticides (Selected) & PCB (1, 4)	1	2022/04/11	2022/04/13	CAM SOP-00307	EPA 8081A/ 8082B m
OC Pesticides Summed Parameters (1)	1	N/A	2022/04/05	CAM SOP-00307	EPA 8081A/8082B m
PAH in Water by GC/MS (SIM)	1	2022/04/05	2022/04/05	ATL SOP 00103	EPA 8270E R6 m
pH (5)	1	N/A	2022/04/08	ATL SOP 00003	SM 23 4500-H+ B m
Total Kjeldahl Nitrogen in Water (1)	1	2022/04/06	2022/04/07	CAM SOP-00938	OMOE E3516 m
Phosphorus Total Colourimetry	1	2022/04/06	2022/04/08	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	1	2022/04/06	2022/04/11	ATL SOP 00007	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2022/04/08	ATL SOP 00133	EPA 8260D R4 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your Project #: 191742
Your C.O.C. #: 872697-01-01

Attention: Julie Ellsworth

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/04/14
Report #: R7085825
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C286274

Received: 2022/04/01, 15:49

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(2) Non-accredited test method
(3) * Analysis performed using frozen aliquot due to Hold Time and/or QC issues.
(4) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane
(5) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Preeti Kapadia, Project Manager
Email: Preeti.Kapadia@bureauveritas.com
Phone# (902)420-0203 Ext:252
==========
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C286274
Report Date: 2022/04/14

Dillon Consulting Limited
Client Project #: 191742
Sampler Initials: KC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
Calculated Parameters				
Nitrate (N)	mg/L	<0.050	0.050	7917230
Inorganics				
Carbonaceous BOD	mg/L	2.8	2.6	7924281
Total Chemical Oxygen Demand	mg/L	690	100	7924744
Dissolved Fluoride (F-)	mg/L	0.51	0.10	7929250
Total Kjeldahl Nitrogen (TKN)	mg/L	0.48	0.10	7925564
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	7933061
Nitrite (N)	mg/L	<0.010	0.010	7933068
Nitrogen (Ammonia Nitrogen)	mg/L	0.096	0.050	7932743
pH	pH	7.85		7929248
Total Phosphorus	mg/L	0.032	0.020	7924700
Total Residual Chlorine	mg/L	<0.10	0.10	7917080
Total Suspended Solids	mg/L	8.0	1.0	7924471
Total Cyanide (CN)	mg/L	<0.0050	0.0050	7925089

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

MERCURY BY COLD VAPOUR AA (WATER)

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
Metals				
Total Mercury (Hg)	ug/L	<0.013	0.013	7929433

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

ELEMENTS BY ICP/MS (WATER)

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	RWS1	RDL	QC Batch
Metals				
Total Aluminum (Al)	ug/L	120	50	7921807
Total Antimony (Sb)	ug/L	<10	10	7921807
Total Arsenic (As)	ug/L	<10	10	7921807
Total Barium (Ba)	ug/L	<10	10	7921807
Total Beryllium (Be)	ug/L	<1.0	1.0	7921807
Total Boron (B)	ug/L	3400	500	7921807
Total Cadmium (Cd)	ug/L	<0.10	0.10	7921807
Total Chromium (Cr)	ug/L	<10	10	7921807
Total Cobalt (Co)	ug/L	<4.0	4.0	7921807
Total Copper (Cu)	ug/L	<5.0	5.0	7921807
Total Iron (Fe)	ug/L	<500	500	7921807
Total Lead (Pb)	ug/L	<5.0	5.0	7921807
Total Manganese (Mn)	ug/L	<20	20	7921807
Total Molybdenum (Mo)	ug/L	<20	20	7921807
Total Nickel (Ni)	ug/L	<20	20	7921807
Total Selenium (Se)	ug/L	<5.0	5.0	7921807
Total Silver (Ag)	ug/L	<1.0	1.0	7921807
Total Strontium (Sr)	ug/L	6600	20	7921807
Total Thallium (Tl)	ug/L	<1.0	1.0	7921807
Total Tin (Sn)	ug/L	<20	20	7921807
Total Titanium (Ti)	ug/L	<20	20	7921807
Total Uranium (U)	ug/L	2.7	1.0	7921807
Total Vanadium (V)	ug/L	<20	20	7921807
Total Zinc (Zn)	ug/L	<50	50	7921807

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	RWS1	RDL	QC Batch
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	<0.050	0.050	7921824
2-Methylnaphthalene	ug/L	<0.050	0.050	7921824
Acenaphthene	ug/L	<0.010	0.010	7921824
Acenaphthylene	ug/L	<0.010	0.010	7921824
Anthracene	ug/L	<0.010	0.010	7921824
Benzo(a)anthracene	ug/L	<0.010	0.010	7921824
Benzo(a)pyrene	ug/L	<0.010	0.010	7921824
Benzo(b)fluoranthene	ug/L	<0.010	0.010	7921824
Benzo(b/j)fluoranthene	ug/L	<0.020	0.020	7916729
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	7921824
Benzo(j)fluoranthene	ug/L	<0.010	0.010	7921824
Benzo(k)fluoranthene	ug/L	<0.010	0.010	7921824
Chrysene	ug/L	<0.010	0.010	7921824
Dibenzo(a,h)anthracene	ug/L	<0.010	0.010	7921824
Fluoranthene	ug/L	<0.010	0.010	7921824
Fluorene	ug/L	<0.010	0.010	7921824
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	7921824
Naphthalene	ug/L	<0.20	0.20	7921824
Perylene	ug/L	<0.010	0.010	7921824
Phenanthrene	ug/L	<0.010	0.010	7921824
Pyrene	ug/L	<0.010	0.010	7921824
Phenolics				
2,3,4,6-Tetrachlorophenol	ug/L	<0.1	0.1	7928755
2,4-Dichlorophenol	ug/L	<0.1	0.1	7928755
2,4,6-Trichlorophenol	ug/L	<0.1	0.1	7928755
Pentachlorophenol	ug/L	<0.1	0.1	7928755
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	86		7928755
2-Fluorophenol	%	54		7928755
D5-Phenol	%	39		7928755
D10-Anthracene	%	94		7921824
D14-Terphenyl	%	98		7921824
D8-Acenaphthylene	%	94		7921824

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	RWS1	RDL	QC Batch
Volatile Organics				
1,1-Dichloroethane	ug/L	<2.0	2.0	7927325
1,1-Dichloroethylene	ug/L	<0.50	0.50	7927325
1,1,1-Trichloroethane	ug/L	<1.0	1.0	7927325
1,1,2-Trichloroethane	ug/L	<1.0	1.0	7927325
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7927325
Ethylene Dibromide	ug/L	<0.20	0.20	7927325
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7927325
1,2-Dichloroethane	ug/L	<1.0	1.0	7927325
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7927325
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7927325
1,2-Dichloropropane	ug/L	<0.50	0.50	7927325
1,3-Dichlorobenzene	ug/L	<1.0	1.0	7927325
cis-1,3-Dichloropropene	ug/L	<0.50	0.50	7927325
trans-1,3-Dichloropropene	ug/L	<0.50	0.50	7927325
1,4-Dichlorobenzene	ug/L	<1.0	1.0	7927325
Benzene	ug/L	<1.0	1.0	7927325
Bromodichloromethane	ug/L	<1.0	1.0	7927325
Bromoform	ug/L	<1.0	1.0	7927325
Bromomethane	ug/L	<0.50	0.50	7927325
Carbon Tetrachloride	ug/L	<0.50	0.50	7927325
Chlorobenzene	ug/L	<1.0	1.0	7927325
Chloroethane	ug/L	<8.0	8.0	7927325
Chloroform	ug/L	<1.0	1.0	7927325
Chloromethane	ug/L	<8.0	8.0	7927325
Dibromochloromethane	ug/L	<1.0	1.0	7927325
Methylene Chloride(Dichloromethane)	ug/L	<3.0	3.0	7927325
Ethylbenzene	ug/L	<1.0	1.0	7927325
Methyl t-butyl ether (MTBE)	ug/L	<2.0	2.0	7927325
Styrene	ug/L	<1.0	1.0	7927325
Tetrachloroethylene	ug/L	<1.0	1.0	7927325
Toluene	ug/L	<1.0	1.0	7927325
Trichloroethylene	ug/L	<1.0	1.0	7927325
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	8.0	7927325
Vinyl Chloride	ug/L	<0.50	0.50	7927325
o-Xylene	ug/L	<1.0	1.0	7927325

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
p+m-Xylene	ug/L	<2.0	2.0	7927325
Total Xylenes	ug/L	<1.0	1.0	7927325
Total Trihalomethanes	ug/L	<1.0	1.0	7927325
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	97		7927325
D4-1,2-Dichloroethane	%	103		7927325
D8-Toluene	%	98		7927325

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

ORGANOCHLORINATED PESTICIDES BY GC-ECD (WATER)

Bureau Veritas ID		SGE931		
Sampling Date		2022/04/01 13:15		
COC Number		872697-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
Calculated Parameters				
o,p-DDD + p,p-DDD	ug/L	<0.006	0.006	7917567
o,p-DDE + p,p-DDE	ug/L	<0.006	0.006	7917567
o,p-DDT + p,p-DDT	ug/L	<0.006	0.006	7917567
Total Endosulfan	ug/L	<0.005	0.005	7917567
Total PCB	ug/L	<0.05	0.05	7917567
Pesticides & Herbicides				
alpha-BHC	ug/L	<0.0050	0.0050	7934638
Endosulfan I (alpha)	ug/L	<0.0050	0.0050	7934638
Endosulfan II (beta)	ug/L	<0.0050	0.0050	7934638
Endrin	ug/L	<0.0050	0.0050	7934638
Mirex	ug/L	<0.0050	0.0050	7934638
Lindane	ug/L	<0.0060	0.0060	7934638
Heptachlor	ug/L	<0.0060	0.0060	7934638
Aldrin	ug/L	<0.0060	0.0060	7934638
Heptachlor epoxide	ug/L	<0.0060	0.0060	7934638
g-Chlordane	ug/L	<0.0060	0.0060	7934638
a-Chlordane	ug/L	<0.0060	0.0060	7934638
Dieldrin	ug/L	<0.0060	0.0060	7934638
Methoxychlor	ug/L	<0.024	0.024	7934638
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	38		7934638
Decachlorobiphenyl	%	76		7934638

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.0°C

Sample SGE931 [RWS1] : Elevated reporting limits for trace metals due to sample matrix.

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7917080	ZZH	QC Standard	Total Residual Chlorine	2022/04/01		95	%	80 - 120
7917080	ZZH	Method Blank	Total Residual Chlorine	2022/04/01	<0.10		mg/L	
7917080	ZZH	RPD	Total Residual Chlorine	2022/04/01	NC		%	25
7921807	BAN	Matrix Spike	Total Aluminum (Al)	2022/04/05		104	%	80 - 120
			Total Antimony (Sb)	2022/04/05		98	%	80 - 120
			Total Arsenic (As)	2022/04/05		96	%	80 - 120
			Total Barium (Ba)	2022/04/05		99	%	80 - 120
			Total Beryllium (Be)	2022/04/05		95	%	80 - 120
			Total Boron (B)	2022/04/05		88	%	80 - 120
			Total Cadmium (Cd)	2022/04/05		97	%	80 - 120
			Total Chromium (Cr)	2022/04/05		100	%	80 - 120
			Total Cobalt (Co)	2022/04/05		101	%	80 - 120
			Total Copper (Cu)	2022/04/05		101	%	80 - 120
			Total Iron (Fe)	2022/04/05		105	%	80 - 120
			Total Lead (Pb)	2022/04/05		101	%	80 - 120
			Total Manganese (Mn)	2022/04/05		103	%	80 - 120
			Total Molybdenum (Mo)	2022/04/05		104	%	80 - 120
			Total Nickel (Ni)	2022/04/05		100	%	80 - 120
			Total Selenium (Se)	2022/04/05		98	%	80 - 120
			Total Silver (Ag)	2022/04/05		98	%	80 - 120
			Total Strontium (Sr)	2022/04/05		100	%	80 - 120
			Total Thallium (Tl)	2022/04/05		103	%	80 - 120
			Total Tin (Sn)	2022/04/05		99	%	80 - 120
			Total Titanium (Ti)	2022/04/05		103	%	80 - 120
			Total Uranium (U)	2022/04/05		104	%	80 - 120
			Total Vanadium (V)	2022/04/05		101	%	80 - 120
			Total Zinc (Zn)	2022/04/05		101	%	80 - 120
7921807	BAN	Spiked Blank	Total Aluminum (Al)	2022/04/05		103	%	80 - 120
			Total Antimony (Sb)	2022/04/05		100	%	80 - 120
			Total Arsenic (As)	2022/04/05		93	%	80 - 120
			Total Barium (Ba)	2022/04/05		99	%	80 - 120
			Total Beryllium (Be)	2022/04/05		96	%	80 - 120
			Total Boron (B)	2022/04/05		91	%	80 - 120
			Total Cadmium (Cd)	2022/04/05		96	%	80 - 120
			Total Chromium (Cr)	2022/04/05		98	%	80 - 120
			Total Cobalt (Co)	2022/04/05		99	%	80 - 120
			Total Copper (Cu)	2022/04/05		99	%	80 - 120
			Total Iron (Fe)	2022/04/05		103	%	80 - 120
			Total Lead (Pb)	2022/04/05		99	%	80 - 120
			Total Manganese (Mn)	2022/04/05		102	%	80 - 120
			Total Molybdenum (Mo)	2022/04/05		101	%	80 - 120
			Total Nickel (Ni)	2022/04/05		99	%	80 - 120
			Total Selenium (Se)	2022/04/05		96	%	80 - 120
			Total Silver (Ag)	2022/04/05		96	%	80 - 120
			Total Strontium (Sr)	2022/04/05		100	%	80 - 120
			Total Thallium (Tl)	2022/04/05		101	%	80 - 120
			Total Tin (Sn)	2022/04/05		102	%	80 - 120
			Total Titanium (Ti)	2022/04/05		102	%	80 - 120
			Total Uranium (U)	2022/04/05		103	%	80 - 120
			Total Vanadium (V)	2022/04/05		100	%	80 - 120
			Total Zinc (Zn)	2022/04/05		99	%	80 - 120
7921807	BAN	Method Blank	Total Aluminum (Al)	2022/04/05	<5.0		ug/L	
			Total Antimony (Sb)	2022/04/05	<1.0		ug/L	
			Total Arsenic (As)	2022/04/05	<1.0		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Barium (Ba)	2022/04/05	<1.0		ug/L	
			Total Beryllium (Be)	2022/04/05	<0.10		ug/L	
			Total Boron (B)	2022/04/05	<50		ug/L	
			Total Cadmium (Cd)	2022/04/05	<0.010		ug/L	
			Total Chromium (Cr)	2022/04/05	<1.0		ug/L	
			Total Cobalt (Co)	2022/04/05	<0.40		ug/L	
			Total Copper (Cu)	2022/04/05	<0.50		ug/L	
			Total Iron (Fe)	2022/04/05	<50		ug/L	
			Total Lead (Pb)	2022/04/05	<0.50		ug/L	
			Total Manganese (Mn)	2022/04/05	<2.0		ug/L	
			Total Molybdenum (Mo)	2022/04/05	<2.0		ug/L	
			Total Nickel (Ni)	2022/04/05	<2.0		ug/L	
			Total Selenium (Se)	2022/04/05	<0.50		ug/L	
			Total Silver (Ag)	2022/04/05	<0.10		ug/L	
			Total Strontium (Sr)	2022/04/05	<2.0		ug/L	
			Total Thallium (Tl)	2022/04/05	<0.10		ug/L	
			Total Tin (Sn)	2022/04/05	<2.0		ug/L	
			Total Titanium (Ti)	2022/04/05	<2.0		ug/L	
			Total Uranium (U)	2022/04/05	<0.10		ug/L	
			Total Vanadium (V)	2022/04/05	<2.0		ug/L	
			Total Zinc (Zn)	2022/04/05	<5.0		ug/L	
7921807	BAN	RPD	Total Aluminum (Al)	2022/04/05	1.6		%	20
7921824	LGE	Matrix Spike	D10-Anthracene	2022/04/05		105	%	50 - 130
			D14-Terphenyl	2022/04/05		110	%	50 - 130
			D8-Acenaphthylene	2022/04/05		104	%	50 - 130
			1-Methylnaphthalene	2022/04/05		106	%	50 - 130
			2-Methylnaphthalene	2022/04/05		100	%	50 - 130
			Acenaphthene	2022/04/05		106	%	50 - 130
			Acenaphthylene	2022/04/05		102	%	50 - 130
			Anthracene	2022/04/05		99	%	50 - 130
			Benzo(a)anthracene	2022/04/05		92	%	50 - 130
			Benzo(a)pyrene	2022/04/05		84	%	50 - 130
			Benzo(b)fluoranthene	2022/04/05		87	%	50 - 130
			Benzo(g,h,i)perylene	2022/04/05		82	%	50 - 130
			Benzo(j)fluoranthene	2022/04/05		85	%	50 - 130
			Benzo(k)fluoranthene	2022/04/05		85	%	50 - 130
			Chrysene	2022/04/05		102	%	50 - 130
			Dibenzo(a,h)anthracene	2022/04/05		77	%	50 - 130
			Fluoranthene	2022/04/05		99	%	50 - 130
			Fluorene	2022/04/05		108	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/04/05		77	%	50 - 130
			Naphthalene	2022/04/05		104	%	50 - 130
			Perylene	2022/04/05		85	%	50 - 130
			Phenanthrene	2022/04/05		104	%	50 - 130
			Pyrene	2022/04/05		101	%	50 - 130
7921824	LGE	Spiked Blank	D10-Anthracene	2022/04/05		103	%	50 - 130
			D14-Terphenyl	2022/04/05		105	%	50 - 130
			D8-Acenaphthylene	2022/04/05		100	%	50 - 130
			1-Methylnaphthalene	2022/04/05		103	%	50 - 130
			2-Methylnaphthalene	2022/04/05		97	%	50 - 130
			Acenaphthene	2022/04/05		105	%	50 - 130
			Acenaphthylene	2022/04/05		98	%	50 - 130
			Anthracene	2022/04/05		94	%	50 - 130
			Benzo(a)anthracene	2022/04/05		81	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)pyrene	2022/04/05		84	%	50 - 130
			Benzo(b)fluoranthene	2022/04/05		89	%	50 - 130
			Benzo(g,h,i)perylene	2022/04/05		84	%	50 - 130
			Benzo(j)fluoranthene	2022/04/05		85	%	50 - 130
			Benzo(k)fluoranthene	2022/04/05		84	%	50 - 130
			Chrysene	2022/04/05		92	%	50 - 130
			Dibenzo(a,h)anthracene	2022/04/05		70	%	50 - 130
			Fluoranthene	2022/04/05		96	%	50 - 130
			Fluorene	2022/04/05		106	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/04/05		76	%	50 - 130
			Naphthalene	2022/04/05		103	%	50 - 130
			Perylene	2022/04/05		85	%	50 - 130
			Phenanthrene	2022/04/05		102	%	50 - 130
			Pyrene	2022/04/05		97	%	50 - 130
7921824	LGE	Method Blank	D10-Anthracene	2022/04/05		98	%	50 - 130
			D14-Terphenyl	2022/04/05		102	%	50 - 130
			D8-Acenaphthylene	2022/04/05		96	%	50 - 130
			1-Methylnaphthalene	2022/04/05	<0.050		ug/L	
			2-Methylnaphthalene	2022/04/05	<0.050		ug/L	
			Acenaphthene	2022/04/05	<0.010		ug/L	
			Acenaphthylene	2022/04/05	<0.010		ug/L	
			Anthracene	2022/04/05	<0.010		ug/L	
			Benzo(a)anthracene	2022/04/05	<0.010		ug/L	
			Benzo(a)pyrene	2022/04/05	<0.010		ug/L	
			Benzo(b)fluoranthene	2022/04/05	<0.010		ug/L	
			Benzo(g,h,i)perylene	2022/04/05	<0.010		ug/L	
			Benzo(j)fluoranthene	2022/04/05	<0.010		ug/L	
			Benzo(k)fluoranthene	2022/04/05	<0.010		ug/L	
			Chrysene	2022/04/05	<0.010		ug/L	
			Dibenzo(a,h)anthracene	2022/04/05	<0.010		ug/L	
			Fluoranthene	2022/04/05	<0.010		ug/L	
			Fluorene	2022/04/05	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2022/04/05	<0.010		ug/L	
			Naphthalene	2022/04/05	<0.20		ug/L	
			Perylene	2022/04/05	<0.010		ug/L	
			Phenanthrene	2022/04/05	<0.010		ug/L	
			Pyrene	2022/04/05	<0.010		ug/L	
7921824	LGE	RPD	1-Methylnaphthalene	2022/04/05	1.1		%	40
			2-Methylnaphthalene	2022/04/05	1.0		%	40
			Acenaphthene	2022/04/05	4.7		%	40
			Acenaphthylene	2022/04/05	NC		%	40
			Anthracene	2022/04/05	NC		%	40
			Benzo(a)anthracene	2022/04/05	NC		%	40
			Benzo(a)pyrene	2022/04/05	NC		%	40
			Benzo(b)fluoranthene	2022/04/05	NC		%	40
			Benzo(g,h,i)perylene	2022/04/05	NC		%	40
			Benzo(j)fluoranthene	2022/04/05	NC		%	40
			Benzo(k)fluoranthene	2022/04/05	NC		%	40
			Chrysene	2022/04/05	NC		%	40
			Dibenzo(a,h)anthracene	2022/04/05	NC		%	40
			Fluoranthene	2022/04/05	32		%	40
			Fluorene	2022/04/05	3.4		%	40
			Indeno(1,2,3-cd)pyrene	2022/04/05	NC		%	40
			Naphthalene	2022/04/05	NC		%	40

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perylene	2022/04/05	NC		%	40
			Phenanthrene	2022/04/05	8.8		%	40
			Pyrene	2022/04/05	3.0		%	40
7924281	MNC	QC Standard	Carbonaceous BOD	2022/04/11		130 (1)	%	80 - 120
7924281	MNC	Spiked Blank	Carbonaceous BOD	2022/04/11		130 (2)	%	80 - 120
7924281	MNC	Method Blank	Carbonaceous BOD	2022/04/11	<2.0		mg/L	
7924471	MKX	QC Standard	Total Suspended Solids	2022/04/11		99	%	80 - 120
7924471	MKX	Method Blank	Total Suspended Solids	2022/04/11	<1.0		mg/L	
7924471	MKX	RPD	Total Suspended Solids	2022/04/11	2.9		%	20
7924700	EMT	Matrix Spike	Total Phosphorus	2022/04/08		109	%	80 - 120
7924700	EMT	Spiked Blank	Total Phosphorus	2022/04/08		102	%	80 - 120
7924700	EMT	Method Blank	Total Phosphorus	2022/04/08	<0.020		mg/L	
7924700	EMT	RPD	Total Phosphorus	2022/04/08	6.9		%	25
7924744	ZZH	Matrix Spike	Total Chemical Oxygen Demand	2022/04/07		100	%	80 - 120
7924744	ZZH	QC Standard	Total Chemical Oxygen Demand	2022/04/07		100	%	80 - 120
7924744	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2022/04/07		101	%	80 - 120
7924744	ZZH	Method Blank	Total Chemical Oxygen Demand	2022/04/07	<20		mg/L	
7924744	ZZH	RPD	Total Chemical Oxygen Demand	2022/04/07	3.4		%	25
7925089	NS3	Matrix Spike	Total Cyanide (CN)	2022/04/06		90	%	80 - 120
7925089	NS3	Spiked Blank	Total Cyanide (CN)	2022/04/06		95	%	80 - 120
7925089	NS3	Method Blank	Total Cyanide (CN)	2022/04/06	<0.0050		mg/L	
7925089	NS3	RPD	Total Cyanide (CN)	2022/04/06	NC		%	20
7925564	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2022/04/07		104	%	80 - 120
7925564	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2022/04/07		96	%	80 - 120
7925564	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2022/04/07		101	%	80 - 120
7925564	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2022/04/07	<0.10		mg/L	
7925564	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2022/04/07	6.3		%	20
7927325	ASL	Matrix Spike	4-Bromofluorobenzene	2022/04/08		103	%	70 - 130
			D4-1,2-Dichloroethane	2022/04/08		99	%	70 - 130
			D8-Toluene	2022/04/08		95	%	70 - 130
			1,1-Dichloroethane	2022/04/08		101	%	70 - 130
			1,1-Dichloroethylene	2022/04/08		98	%	70 - 130
			1,1,1-Trichloroethane	2022/04/08		105	%	70 - 130
			1,1,2-Trichloroethane	2022/04/08		103	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/04/08		99	%	70 - 130
			Ethylene Dibromide	2022/04/08		99	%	70 - 130
			1,2-Dichlorobenzene	2022/04/08		95	%	70 - 130
			1,2-Dichloroethane	2022/04/08		98	%	70 - 130
			cis-1,2-Dichloroethylene	2022/04/08		92	%	70 - 130
			trans-1,2-Dichloroethylene	2022/04/08		101	%	70 - 130
			1,2-Dichloropropane	2022/04/08		97	%	70 - 130
			1,3-Dichlorobenzene	2022/04/08		95	%	70 - 130
			cis-1,3-Dichloropropene	2022/04/08		92	%	70 - 130
			trans-1,3-Dichloropropene	2022/04/08		103	%	70 - 130
			1,4-Dichlorobenzene	2022/04/08		93	%	70 - 130
			Benzene	2022/04/08		95	%	70 - 130
			Bromodichloromethane	2022/04/08		101	%	70 - 130
			Bromoform	2022/04/08		105	%	70 - 130
			Bromomethane	2022/04/08		81	%	60 - 140
			Carbon Tetrachloride	2022/04/08		97	%	70 - 130
			Chlorobenzene	2022/04/08		100	%	70 - 130
			Chloroethane	2022/04/08		91	%	60 - 140
			Chloroform	2022/04/08		108	%	70 - 130
			Chloromethane	2022/04/08		90	%	60 - 140

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dibromochloromethane	2022/04/08		86	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/04/08		101	%	70 - 130
			Ethylbenzene	2022/04/08		97	%	70 - 130
			Methyl t-butyl ether (MTBE)	2022/04/08		95	%	70 - 130
			Styrene	2022/04/08		103	%	70 - 130
			Tetrachloroethylene	2022/04/08		98	%	70 - 130
			Toluene	2022/04/08		96	%	70 - 130
			Trichloroethylene	2022/04/08		98	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2022/04/08		94	%	60 - 140
			Vinyl Chloride	2022/04/08		89	%	60 - 140
			o-Xylene	2022/04/08		101	%	70 - 130
			p+m-Xylene	2022/04/08		94	%	70 - 130
7927325	ASL	Spiked Blank	4-Bromofluorobenzene	2022/04/08		102	%	70 - 130
			D4-1,2-Dichloroethane	2022/04/08		96	%	70 - 130
			D8-Toluene	2022/04/08		96	%	70 - 130
			1,1-Dichloroethane	2022/04/08		99	%	70 - 130
			1,1-Dichloroethylene	2022/04/08		97	%	70 - 130
			1,1,1-Trichloroethane	2022/04/08		104	%	70 - 130
			1,1,2-Trichloroethane	2022/04/08		99	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/04/08		92	%	70 - 130
			Ethylene Dibromide	2022/04/08		94	%	70 - 130
			1,2-Dichlorobenzene	2022/04/08		93	%	70 - 130
			1,2-Dichloroethane	2022/04/08		93	%	70 - 130
			cis-1,2-Dichloroethylene	2022/04/08		90	%	70 - 130
			trans-1,2-Dichloroethylene	2022/04/08		99	%	70 - 130
			1,2-Dichloropropane	2022/04/08		93	%	70 - 130
			1,3-Dichlorobenzene	2022/04/08		93	%	70 - 130
			cis-1,3-Dichloropropene	2022/04/08		90	%	70 - 130
			trans-1,3-Dichloropropene	2022/04/08		98	%	70 - 130
			1,4-Dichlorobenzene	2022/04/08		90	%	70 - 130
			Benzene	2022/04/08		92	%	70 - 130
			Bromodichloromethane	2022/04/08		97	%	70 - 130
			Bromoform	2022/04/08		98	%	70 - 130
			Bromomethane	2022/04/08		78	%	60 - 140
			Carbon Tetrachloride	2022/04/08		95	%	70 - 130
			Chlorobenzene	2022/04/08		96	%	70 - 130
			Chloroethane	2022/04/08		90	%	60 - 140
			Chloroform	2022/04/08		106	%	70 - 130
			Chloromethane	2022/04/08		88	%	60 - 140
			Dibromochloromethane	2022/04/08		83	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/04/08		97	%	70 - 130
			Ethylbenzene	2022/04/08		94	%	70 - 130
			Methyl t-butyl ether (MTBE)	2022/04/08		93	%	70 - 130
			Styrene	2022/04/08		100	%	70 - 130
			Tetrachloroethylene	2022/04/08		96	%	70 - 130
			Toluene	2022/04/08		95	%	70 - 130
			Trichloroethylene	2022/04/08		97	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2022/04/08		94	%	60 - 140
			Vinyl Chloride	2022/04/08		88	%	60 - 140
			o-Xylene	2022/04/08		96	%	70 - 130
			p+m-Xylene	2022/04/08		92	%	70 - 130
7927325	ASL	Method Blank	4-Bromofluorobenzene	2022/04/08		99	%	70 - 130
			D4-1,2-Dichloroethane	2022/04/08		99	%	70 - 130
			D8-Toluene	2022/04/08		98	%	70 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1-Dichloroethane	2022/04/08	<2.0		ug/L	
			1,1-Dichloroethylene	2022/04/08	<0.50		ug/L	
			1,1,1-Trichloroethane	2022/04/08	<1.0		ug/L	
			1,1,2-Trichloroethane	2022/04/08	<1.0		ug/L	
			1,1,2,2-Tetrachloroethane	2022/04/08	<0.50		ug/L	
			Ethylene Dibromide	2022/04/08	<0.20		ug/L	
			1,2-Dichlorobenzene	2022/04/08	<0.50		ug/L	
			1,2-Dichloroethane	2022/04/08	<1.0		ug/L	
			cis-1,2-Dichloroethylene	2022/04/08	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2022/04/08	<0.50		ug/L	
			1,2-Dichloropropane	2022/04/08	<0.50		ug/L	
			1,3-Dichlorobenzene	2022/04/08	<1.0		ug/L	
			cis-1,3-Dichloropropene	2022/04/08	<0.50		ug/L	
			trans-1,3-Dichloropropene	2022/04/08	<0.50		ug/L	
			1,4-Dichlorobenzene	2022/04/08	<1.0		ug/L	
			Benzene	2022/04/08	<1.0		ug/L	
			Bromodichloromethane	2022/04/08	<1.0		ug/L	
			Bromoform	2022/04/08	<1.0		ug/L	
			Bromomethane	2022/04/08	<0.50		ug/L	
			Carbon Tetrachloride	2022/04/08	<0.50		ug/L	
			Chlorobenzene	2022/04/08	<1.0		ug/L	
			Chloroethane	2022/04/08	<8.0		ug/L	
			Chloroform	2022/04/08	<1.0		ug/L	
			Chloromethane	2022/04/08	<8.0		ug/L	
			Dibromochloromethane	2022/04/08	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2022/04/08	<3.0		ug/L	
			Ethylbenzene	2022/04/08	<1.0		ug/L	
			Methyl t-butyl ether (MTBE)	2022/04/08	<2.0		ug/L	
			Styrene	2022/04/08	<1.0		ug/L	
			Tetrachloroethylene	2022/04/08	<1.0		ug/L	
			Toluene	2022/04/08	<1.0		ug/L	
			Trichloroethylene	2022/04/08	<1.0		ug/L	
			Trichlorofluoromethane (FREON 11)	2022/04/08	<8.0		ug/L	
			Vinyl Chloride	2022/04/08	<0.50		ug/L	
			o-Xylene	2022/04/08	<1.0		ug/L	
			p+m-Xylene	2022/04/08	<2.0		ug/L	
			Total Xylenes	2022/04/08	<1.0		ug/L	
			Total Trihalomethanes	2022/04/08	<1.0		ug/L	
7927325	ASL	RPD	1,1,2,2-Tetrachloroethane	2022/04/08	NC		%	40
			1,2-Dichlorobenzene	2022/04/08	NC		%	40
			cis-1,2-Dichloroethylene	2022/04/08	NC		%	40
			trans-1,3-Dichloropropene	2022/04/08	NC		%	40
			1,4-Dichlorobenzene	2022/04/08	NC		%	40
			Benzene	2022/04/08	NC		%	40
			Carbon Tetrachloride	2022/04/08	NC		%	40
			Methylene Chloride(Dichloromethane)	2022/04/08	NC		%	40
			Ethylbenzene	2022/04/08	NC		%	40
			Tetrachloroethylene	2022/04/08	NC		%	40
			Toluene	2022/04/08	NC		%	40
			Trichloroethylene	2022/04/08	NC		%	40
			Total Xylenes	2022/04/08	NC		%	40
7928755	MYI	Matrix Spike	2,4,6-Tribromophenol	2022/04/11		88	%	50 - 130
			2-Fluorophenol	2022/04/11		50	%	50 - 130
			D5-Phenol	2022/04/11		40	%	30 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			2,3,4,6-Tetrachlorophenol	2022/04/11		87	%	10 - 130
			2,4-Dichlorophenol	2022/04/11		104	%	50 - 130
			2,4,6-Trichlorophenol	2022/04/11		102	%	10 - 130
			Pentachlorophenol	2022/04/11		88	%	50 - 130
7928755	MYI	Spiked Blank	2,4,6-Tribromophenol	2022/04/11		83	%	50 - 130
			2-Fluorophenol	2022/04/11		43 (3)	%	50 - 130
			D5-Phenol	2022/04/11		41	%	30 - 130
			2,3,4,6-Tetrachlorophenol	2022/04/11		88	%	10 - 130
			2,4-Dichlorophenol	2022/04/11		103	%	50 - 130
			2,4,6-Trichlorophenol	2022/04/11		93	%	10 - 130
			Pentachlorophenol	2022/04/11		85	%	50 - 130
7928755	MYI	Method Blank	2,4,6-Tribromophenol	2022/04/11		80	%	50 - 130
			2-Fluorophenol	2022/04/11		62	%	50 - 130
			D5-Phenol	2022/04/11		47	%	30 - 130
			2,3,4,6-Tetrachlorophenol	2022/04/11	<0.1		ug/L	
			2,4-Dichlorophenol	2022/04/11	<0.1		ug/L	
			2,4,6-Trichlorophenol	2022/04/11	<0.1		ug/L	
			Pentachlorophenol	2022/04/11	<0.1		ug/L	
7928755	MYI	RPD	2,3,4,6-Tetrachlorophenol	2022/04/11	NC		%	40
			2,4-Dichlorophenol	2022/04/11	NC		%	30
			2,4,6-Trichlorophenol	2022/04/11	NC		%	30
			Pentachlorophenol	2022/04/11	NC		%	30
7929248	SHW	Spiked Blank	pH	2022/04/08		100	%	97 - 103
7929248	SHW	RPD	pH	2022/04/08	0.80		%	N/A
7929250	SHW	Matrix Spike	Dissolved Fluoride (F-)	2022/04/08		93	%	80 - 120
7929250	SHW	Spiked Blank	Dissolved Fluoride (F-)	2022/04/08		100	%	80 - 120
7929250	SHW	Method Blank	Dissolved Fluoride (F-)	2022/04/08	<0.10		mg/L	
7929250	SHW	RPD	Dissolved Fluoride (F-)	2022/04/08	NC		%	20
7929433	FJO	Matrix Spike	Total Mercury (Hg)	2022/04/11		105	%	80 - 120
7929433	FJO	Spiked Blank	Total Mercury (Hg)	2022/04/11		103	%	80 - 120
7929433	FJO	Method Blank	Total Mercury (Hg)	2022/04/11	<0.013		ug/L	
7929433	FJO	RPD	Total Mercury (Hg)	2022/04/11	NC		%	20
7932743	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2022/04/11		97	%	80 - 120
7932743	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2022/04/11		100	%	80 - 120
7932743	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2022/04/11	<0.050		mg/L	
7932743	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2022/04/11	NC		%	20
7933061	MCN	Matrix Spike	Nitrate + Nitrite (N)	2022/04/12		96	%	80 - 120
7933061	MCN	Spiked Blank	Nitrate + Nitrite (N)	2022/04/12		101	%	80 - 120
7933061	MCN	Method Blank	Nitrate + Nitrite (N)	2022/04/12	<0.050		mg/L	
7933061	MCN	RPD	Nitrate + Nitrite (N)	2022/04/12	NC		%	20
7933068	MCN	Matrix Spike	Nitrite (N)	2022/04/12		99	%	80 - 120
7933068	MCN	Spiked Blank	Nitrite (N)	2022/04/12		102	%	80 - 120
7933068	MCN	Method Blank	Nitrite (N)	2022/04/12	<0.010		mg/L	
7933068	MCN	RPD	Nitrite (N)	2022/04/12	NC		%	20
7934638	LPG	Matrix Spike [SGE931-16]	2,4,5,6-Tetrachloro-m-xylene	2022/04/13		37	%	30 - 130
			alpha-BHC	2022/04/13		101	%	30 - 130
			Decachlorobiphenyl	2022/04/13		128	%	30 - 130
			Endosulfan I (alpha)	2022/04/13		106	%	30 - 130
			Endosulfan II (beta)	2022/04/13		115	%	30 - 130
			Endrin	2022/04/13		127	%	30 - 130
			Mirex	2022/04/13		115	%	30 - 130
			Lindane	2022/04/13		103	%	30 - 130
			Heptachlor	2022/04/13		106	%	30 - 130
			Aldrin	2022/04/13		105	%	30 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Heptachlor epoxide	2022/04/13		121	%	30 - 130
			g-Chlordane	2022/04/13		116	%	30 - 130
			a-Chlordane	2022/04/13		118	%	30 - 130
			Dieldrin	2022/04/13		129	%	30 - 130
			Methoxychlor	2022/04/13		127	%	30 - 130
7934638	LPG	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2022/04/13		56	%	30 - 130
			alpha-BHC	2022/04/13		82	%	30 - 130
			Decachlorobiphenyl	2022/04/13		102	%	30 - 130
			Endosulfan I (alpha)	2022/04/13		108	%	30 - 130
			Endosulfan II (beta)	2022/04/13		90	%	30 - 130
			Endrin	2022/04/13		89	%	30 - 130
			Mirex	2022/04/13		90	%	30 - 130
			Lindane	2022/04/13		84	%	30 - 130
			Heptachlor	2022/04/13		84	%	30 - 130
			Aldrin	2022/04/13		90	%	30 - 130
			Heptachlor epoxide	2022/04/13		103	%	30 - 130
			g-Chlordane	2022/04/13		93	%	30 - 130
			a-Chlordane	2022/04/13		91	%	30 - 130
			Dieldrin	2022/04/13		100	%	30 - 130
			Methoxychlor	2022/04/13		111	%	30 - 130
7934638	LPG	RPD	alpha-BHC	2022/04/13	11		%	40
			Endosulfan I (alpha)	2022/04/13	2.3		%	40
			Endosulfan II (beta)	2022/04/13	11		%	40
			Endrin	2022/04/13	14		%	40
			Mirex	2022/04/13	10		%	40
			Lindane	2022/04/13	6.1		%	40
			Heptachlor	2022/04/13	3.1		%	40
			Aldrin	2022/04/13	0.39		%	40
			Heptachlor epoxide	2022/04/13	0.22		%	40
			g-Chlordane	2022/04/13	9.9		%	40
			a-Chlordane	2022/04/13	7.3		%	40
			Dieldrin	2022/04/13	11		%	40
			Methoxychlor	2022/04/13	6.7		%	40
7934638	LPG	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2022/04/13		51	%	30 - 130
			alpha-BHC	2022/04/13	<0.0050		ug/L	
			Decachlorobiphenyl	2022/04/13		107	%	30 - 130
			Endosulfan I (alpha)	2022/04/13	<0.0050		ug/L	
			Endosulfan II (beta)	2022/04/13	<0.0050		ug/L	
			Endrin	2022/04/13	<0.0050		ug/L	
			Mirex	2022/04/13	<0.0050		ug/L	
			Lindane	2022/04/13	<0.0060		ug/L	
			Heptachlor	2022/04/13	<0.0060		ug/L	
			Aldrin	2022/04/13	<0.0060		ug/L	
			Heptachlor epoxide	2022/04/13	<0.0060		ug/L	
			g-Chlordane	2022/04/13	<0.0060		ug/L	
			a-Chlordane	2022/04/13	<0.0060		ug/L	
			Dieldrin	2022/04/13	<0.0060		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methoxychlor	2022/04/13	<0.024		ug/L	

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) CBOD Analysis: Reference Material recovery and Second source QC recovery high. All other QC acceptable.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(3) Surrogate recovery was below the lower control limit . This may represent a low bias in some results.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Cristina Carriere, Senior Scientific Specialist

Janah Rhyno, Metals Supervisor-Bedford

Phil Deveau, Scientific Specialist (Organics)

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Your Project #: 19-1742
Your C.O.C. #: 873088-01-01

Attention: Julie Ellsworth

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/04/11
Report #: R7081404
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C291628
Received: 2022/04/07, 11:25

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
TC/EC Non Drinking Water CFU/100mL	1	N/A	2022/04/07	ATL SOP 00096	MOE E3407 R2

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 19-1742
Your C.O.C. #: 873088-01-01

Attention: Julie Ellsworth

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/04/11
Report #: R7081404
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C291628
Received: 2022/04/07, 11:25

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Preeti Kapadia, Project Manager
Email: Preeti.Kapadia@bureauveritas.com
Phone# (902)420-0203 Ext:252
==========
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

MICROBIOLOGY (WATER)

Bureau Veritas ID		SHL619		
Sampling Date		2022/04/07 10:30		
COC Number		873088-01-01		
	UNITS	RWS-1	RDL	QC Batch
Microbiological				
Escherichia coli	CFU/100mL	<1.0	1.0	7927595
Total Coliforms	CFU/100mL	3.0	1.0	7927595

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.3°C

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Bureau Veritas Job #: C291628
Report Date: 2022/04/11

Dillon Consulting Limited
Client Project #: 19-1742
Sampler Initials: JIE

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7927595	MAA	Method Blank	Escherichia coli	2022/04/07	<1.0		CFU/100mL	
			Total Coliforms	2022/04/07	<1.0		CFU/100mL	

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Bureau Veritas Job #: C291628
Report Date: 2022/04/11

Dillon Consulting Limited
Client Project #: 19-1742
Sampler Initials: JIE

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Robyn Edwards

Robyn Edwards, Bedford Micro Supervisor

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Q2 Raw Data Results

Your Project #: 19-1742
Your C.O.C. #: 884405-01-01

Attention: Paul Koke

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/07/08
Report #: R7201595
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2H2923
Received: 2022/06/22, 13:40

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Benzo(b/j)fluoranthene Sum (water)	1	N/A	2022/06/24	N/A	Auto Calc.
Carbonaceous BOD	1	2022/06/23	2022/06/28	ATL SOP 00041	SM 23 5210B m
Residual Chlorine, Total (2)	1	N/A	2022/06/24	ATL SOP 00038	HACH 8167 10th ed. m
Chemical Oxygen Demand (COD)	1	2022/07/04	2022/07/04	ATL SOP 00042	SM 23 5220D m
TC/EC Non Drinking Water CFU/100mL	1	N/A	2022/06/23	ATL SOP 00096	MOE E3407 R2
Acid Extractables by GC/MS (1)	1	2022/06/24	2022/06/27	CAM SOP-00332	EPA 8270 m
Total Cyanide (1)	1	2022/06/24	2022/06/24	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	N/A	2022/06/28	ATL SOP 00043	SM 23 4500-F- C m
Mercury - Total (CVAA,LL)	1	2022/06/29	2022/06/29	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	1	2022/07/04	2022/07/06	ATL SOP 00058	EPA 6020B R2 m
Nitrogen Ammonia - water	1	N/A	2022/06/27	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	1	N/A	2022/06/28	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	1	N/A	2022/06/28	ATL SOP 00017	SM 23 4500-NO2- B m
Nitrogen - Nitrate (as N)	1	N/A	2022/06/29	ATL SOP 00018	ASTM D3867-16
OC Pesticides (Selected) & PCB (1, 3)	1	2022/06/29	2022/06/29	CAM SOP-00307	EPA 8081A/ 8082B m
OC Pesticides Summed Parameters (1)	1	N/A	2022/06/24	CAM SOP-00307	EPA 8081A/8082B m
PAH in Water by GC/MS (SIM)	1	2022/06/23	2022/06/23	ATL SOP 00103	EPA 8270E R6 m
pH (4)	1	N/A	2022/06/28	ATL SOP 00003	SM 23 4500-H+ B m
Total Kjeldahl Nitrogen in Water (1)	1	2022/06/27	2022/06/28	CAM SOP-00938	OMOE E3516 m
Phosphorus Total Colourimetry	1	2022/07/06	2022/07/08	ATL SOP 00057	EPA 365.1 R2 m
Total Suspended Solids	1	2022/06/29	2022/07/04	ATL SOP 00007	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2022/06/28	ATL SOP 00133	EPA 8260D R4 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your Project #: 19-1742
Your C.O.C. #: 884405-01-01

Attention: Paul Koke

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/07/08
Report #: R7201595
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2H2923
Received: 2022/06/22, 13:40

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(2) Non-accredited test method
(3) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane
(4) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Preeti Kapadia, Project Manager
Email: Preeti.Kapadia@bureauveritas.com
Phone# (902)420-0203 Ext:252
==========
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	RWS1	RDL	QC Batch
Calculated Parameters				
Nitrate (N)	mg/L	<0.050	0.050	8067592
Inorganics				
Carbonaceous BOD	mg/L	<5.0	5.0	8069781
Total Chemical Oxygen Demand	mg/L	970	100	8087480
Dissolved Fluoride (F-)	mg/L	0.60	0.10	8078433
Total Kjeldahl Nitrogen (TKN)	mg/L	0.50	0.10	8077362
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	8076367
Nitrite (N)	mg/L	0.013	0.010	8076369
Nitrogen (Ammonia Nitrogen)	mg/L	0.076	0.050	8076183
pH	pH	8.04		8078427
Total Phosphorus	mg/L	0.020	0.020	8092772
Total Residual Chlorine	mg/L	<0.10	0.10	8070863
Total Suspended Solids	mg/L	6.0	1.0	8081404
Total Cyanide (CN)	mg/L	<0.0050	0.0050	8074223

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

MERCURY BY COLD VAPOUR AA (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
Metals				
Total Mercury (Hg)	ug/L	<0.013	0.013	8078509

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

ELEMENTS BY ICP/MS (WATER)

Bureau Veritas ID		SYY879	SYY879		
Sampling Date		2022/06/22 11:20	2022/06/22 11:20		
COC Number		884405-01-01	884405-01-01		
	UNITS	RWS1	RWS1 Lab-Dup	RDL	QC Batch
Metals					
Total Aluminum (Al)	ug/L	<50	<50	50	8088105
Total Antimony (Sb)	ug/L	<10	<10	10	8088105
Total Arsenic (As)	ug/L	<10	<10	10	8088105
Total Barium (Ba)	ug/L	<10	<10	10	8088105
Total Beryllium (Be)	ug/L	<1.0	<1.0	1.0	8088105
Total Bismuth (Bi)	ug/L	<20	<20	20	8088105
Total Boron (B)	ug/L	3800	3900	500	8088105
Total Cadmium (Cd)	ug/L	<0.10	<0.10	0.10	8088105
Total Calcium (Ca)	ug/L	340000	350000	1000	8088105
Total Chromium (Cr)	ug/L	<10	<10	10	8088105
Total Cobalt (Co)	ug/L	<4.0	<4.0	4.0	8088105
Total Copper (Cu)	ug/L	<5.0	<5.0	5.0	8088105
Total Iron (Fe)	ug/L	<500	<500	500	8088105
Total Lead (Pb)	ug/L	<5.0	<5.0	5.0	8088105
Total Magnesium (Mg)	ug/L	1100000	1100000	1000	8088105
Total Manganese (Mn)	ug/L	<20	<20	20	8088105
Total Molybdenum (Mo)	ug/L	<20	<20	20	8088105
Total Nickel (Ni)	ug/L	<20	<20	20	8088105
Total Phosphorus (P)	ug/L	<1000	<1000	1000	8088105
Total Potassium (K)	ug/L	320000	320000	1000	8088105
Total Selenium (Se)	ug/L	<5.0	<5.0	5.0	8088105
Total Silver (Ag)	ug/L	<1.0	<1.0	1.0	8088105
Total Sodium (Na)	ug/L	8700000	8800000	1000	8088105
Total Strontium (Sr)	ug/L	6300	6400	20	8088105
Total Thallium (Tl)	ug/L	<1.0	<1.0	1.0	8088105
Total Tin (Sn)	ug/L	<20	<20	20	8088105
Total Titanium (Ti)	ug/L	<20	<20	20	8088105
Total Uranium (U)	ug/L	2.6	2.6	1.0	8088105
Total Vanadium (V)	ug/L	<20	<20	20	8088105
Total Zinc (Zn)	ug/L	<50	<50	50	8088105

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	RWS1	RDL	QC Batch
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	<0.050	0.050	8069806
2-Methylnaphthalene	ug/L	<0.050	0.050	8069806
Acenaphthene	ug/L	<0.010	0.010	8069806
Acenaphthylene	ug/L	<0.010	0.010	8069806
Anthracene	ug/L	<0.010	0.010	8069806
Benzo(a)anthracene	ug/L	<0.010	0.010	8069806
Benzo(a)pyrene	ug/L	<0.010	0.010	8069806
Benzo(b)fluoranthene	ug/L	<0.010	0.010	8069806
Benzo(b/j)fluoranthene	ug/L	<0.020	0.020	8067401
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	8069806
Benzo(j)fluoranthene	ug/L	<0.010	0.010	8069806
Benzo(k)fluoranthene	ug/L	<0.010	0.010	8069806
Chrysene	ug/L	<0.010	0.010	8069806
Dibenzo(a,h)anthracene	ug/L	<0.010	0.010	8069806
Fluoranthene	ug/L	<0.010	0.010	8069806
Fluorene	ug/L	<0.010	0.010	8069806
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	8069806
Naphthalene	ug/L	<0.20	0.20	8069806
Perylene	ug/L	<0.010	0.010	8069806
Phenanthrene	ug/L	0.017	0.010	8069806
Pyrene	ug/L	<0.010	0.010	8069806
Phenolics				
2-Chlorophenol	ug/L	<0.1	0.1	8074019
2,3,4,6-Tetrachlorophenol	ug/L	<0.1	0.1	8074019
2,3,5-Trichlorophenol	ug/L	<0.1	0.1	8074019
2,4-Dichlorophenol	ug/L	<0.1	0.1	8074019
2,4-Dimethylphenol	ug/L	<1	1	8074019
2,4,6-Trichlorophenol	ug/L	<0.1	0.1	8074019
2,6-Dichlorophenol	ug/L	<0.1	0.1	8074019
4-Chloro-3-Methylphenol	ug/L	<0.2	0.2	8074019
4-Nitrophenol	ug/L	<1	1	8074019
m/p-Cresol	ug/L	<0.5	0.5	8074019
o-Cresol	ug/L	<0.5	0.5	8074019
Pentachlorophenol	ug/L	<0.1	0.1	8074019
Phenol	ug/L	<0.5	0.5	8074019

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
2,3,4,5-Tetrachlorophenol	ug/L	<0.1	0.1	8074019
2,3,5,6-Tetrachlorophenol	ug/L	<0.1	0.1	8074019
2,3,4-Trichlorophenol	ug/L	<0.1	0.1	8074019
2,3,6-Trichlorophenol	ug/L	<0.1	0.1	8074019
2,4,5-Trichlorophenol	ug/L	<0.1	0.1	8074019
3,4,5-Trichlorophenol	ug/L	<0.1	0.1	8074019
2,4-Dinitrophenol	ug/L	<1	1	8074019
2,3-Dichlorophenol	ug/L	<0.1	0.1	8074019
2,5-Dichlorophenol	ug/L	<0.1	0.1	8074019
3,4-Dichlorophenol	ug/L	<0.1	0.1	8074019
3,5-Dichlorophenol	ug/L	<0.1	0.1	8074019
4,6-Dinitro-2-methylphenol	ug/L	<1	1	8074019
3 & 4-Chlorophenol	ug/L	<0.1	0.1	8074019
2-Nitrophenol	ug/L	<1	1	8074019
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	85		8074019
2-Fluorophenol	%	61		8074019
D5-Phenol	%	37		8074019
D10-Anthracene	%	89		8069806
D14-Terphenyl	%	94		8069806
D8-Acenaphthylene	%	86		8069806

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	RWS1	RDL	QC Batch
Volatile Organics				
1,1-Dichloroethane	ug/L	<2.0	2.0	8073179
1,1-Dichloroethylene	ug/L	<0.50	0.50	8073179
1,1,1-Trichloroethane	ug/L	<1.0	1.0	8073179
1,1,2-Trichloroethane	ug/L	<1.0	1.0	8073179
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	8073179
Ethylene Dibromide	ug/L	<0.20	0.20	8073179
1,2-Dichlorobenzene	ug/L	<0.50	0.50	8073179
1,2-Dichloroethane	ug/L	<1.0	1.0	8073179
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	8073179
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	8073179
1,2-Dichloropropane	ug/L	<0.50	0.50	8073179
1,3-Dichlorobenzene	ug/L	<1.0	1.0	8073179
cis-1,3-Dichloropropene	ug/L	<0.50	0.50	8073179
trans-1,3-Dichloropropene	ug/L	<0.50	0.50	8073179
1,4-Dichlorobenzene	ug/L	<1.0	1.0	8073179
Benzene	ug/L	<1.0	1.0	8073179
Bromodichloromethane	ug/L	<1.0	1.0	8073179
Bromoform	ug/L	<1.0	1.0	8073179
Bromomethane	ug/L	<0.50	0.50	8073179
Carbon Tetrachloride	ug/L	<0.50	0.50	8073179
Chlorobenzene	ug/L	<1.0	1.0	8073179
Chloroethane	ug/L	<8.0	8.0	8073179
Chloroform	ug/L	<1.0	1.0	8073179
Chloromethane	ug/L	<8.0	8.0	8073179
Dibromochloromethane	ug/L	<1.0	1.0	8073179
Methylene Chloride(Dichloromethane)	ug/L	<3.0	3.0	8073179
Ethylbenzene	ug/L	<1.0	1.0	8073179
Methyl t-butyl ether (MTBE)	ug/L	<2.0	2.0	8073179
Styrene	ug/L	<1.0	1.0	8073179
Tetrachloroethylene	ug/L	<1.0	1.0	8073179
Toluene	ug/L	<1.0	1.0	8073179
Trichloroethylene	ug/L	<1.0	1.0	8073179
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	8.0	8073179
Vinyl Chloride	ug/L	<0.50	0.50	8073179
o-Xylene	ug/L	<1.0	1.0	8073179

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	**RWS1**	**RDL**	**QC Batch**
p+m-Xylene	ug/L	<2.0	2.0	8073179
Total Xylenes	ug/L	<1.0	1.0	8073179
Total Trihalomethanes	ug/L	<1.0	1.0	8073179
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	99		8073179
D4-1,2-Dichloroethane	%	100		8073179
D8-Toluene	%	95		8073179

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

ORGANOCHLORINATED PESTICIDES BY GC-ECD (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	RWS1	RDL	QC Batch
Calculated Parameters				
Aldrin + Dieldrin	ug/L	<0.006	0.006	8068374
Chlordane (Total)	ug/L	<0.006	0.006	8068374
DDT+ Metabolites	ug/L	<0.006	0.006	8068374
Heptachlor + Heptachlor epoxide	ug/L	<0.006	0.006	8068374
o,p-DDD + p,p-DDD	ug/L	<0.006	0.006	8068374
o,p-DDE + p,p-DDE	ug/L	<0.006	0.006	8068374
o,p-DDT + p,p-DDT	ug/L	<0.006	0.006	8068374
Total Endosulfan	ug/L	<0.005	0.005	8068374
Total PCB	ug/L	<0.05	0.05	8068374
Pesticides & Herbicides				
Lindane	ug/L	<0.0060	0.0060	8081033
Heptachlor	ug/L	<0.0060	0.0060	8081033
Aldrin	ug/L	<0.0060	0.0060	8081033
Heptachlor epoxide	ug/L	<0.0060	0.0060	8081033
Oxychlordane	ug/L	<0.0060	0.0060	8081033
g-Chlordane	ug/L	<0.0060	0.0060	8081033
a-Chlordane	ug/L	<0.0060	0.0060	8081033
Dieldrin	ug/L	<0.0060	0.0060	8081033
o,p-DDE	ug/L	<0.0060	0.0060	8081033
p,p-DDE	ug/L	<0.0060	0.0060	8081033
o,p-DDD	ug/L	<0.0060	0.0060	8081033
p,p-DDD	ug/L	<0.0060	0.0060	8081033
o,p-DDT	ug/L	<0.0060	0.0060	8081033
p,p-DDT	ug/L	<0.0060	0.0060	8081033
Methoxychlor	ug/L	<0.024	0.024	8081033
Aroclor 1016	ug/L	<0.050	0.050	8081033
Aroclor 1221	ug/L	<0.050	0.050	8081033
Aroclor 1232	ug/L	<0.050	0.050	8081033
Aroclor 1242	ug/L	<0.050	0.050	8081033
Aroclor 1248	ug/L	<0.050	0.050	8081033
Aroclor 1254	ug/L	<0.050	0.050	8081033
Aroclor 1260	ug/L	<0.050	0.050	8081033
Surrogate Recovery (%)				
2,4,5,6-Tetrachloro-m-xylene	%	43		8081033
Decachlorobiphenyl	%	89		8081033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

MICROBIOLOGY (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	RWS1	RDL	QC Batch
Microbiological				
Escherichia coli	CFU/100mL	<1.0	1.0	8070025
Total Coliforms	CFU/100mL	<1.0	1.0	8070025

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.3°C

Sample SYY879 [RWS1] : Elevated reporting limits for trace metals due to sample matrix.

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8069781	MNC	QC Standard	Carbonaceous BOD	2022/06/28		128 (1)	%	80 - 120
8069781	MNC	Spiked Blank	Carbonaceous BOD	2022/06/28		125 (2)	%	80 - 120
8069781	MNC	Method Blank	Carbonaceous BOD	2022/06/28	<2.0		mg/L	
8069781	MNC	RPD	Carbonaceous BOD	2022/06/28	17		%	25
8069806	LGE	Matrix Spike	D10-Anthracene	2022/06/23		86	%	50 - 130
			D14-Terphenyl	2022/06/23		86	%	50 - 130
			D8-Acenaphthylene	2022/06/23		88	%	50 - 130
			1-Methylnaphthalene	2022/06/23		89	%	50 - 130
			2-Methylnaphthalene	2022/06/23		85	%	50 - 130
			Acenaphthene	2022/06/23		84	%	50 - 130
			Acenaphthylene	2022/06/23		87	%	50 - 130
			Anthracene	2022/06/23		80	%	50 - 130
			Benzo(a)anthracene	2022/06/23		75	%	50 - 130
			Benzo(a)pyrene	2022/06/23		67	%	50 - 130
			Benzo(b)fluoranthene	2022/06/23		74	%	50 - 130
			Benzo(g,h,i)perylene	2022/06/23		60	%	50 - 130
			Benzo(j)fluoranthene	2022/06/23		67	%	50 - 130
			Benzo(k)fluoranthene	2022/06/23		67	%	50 - 130
			Chrysene	2022/06/23		73	%	50 - 130
			Dibenzo(a,h)anthracene	2022/06/23		57	%	50 - 130
			Fluoranthene	2022/06/23		82	%	50 - 130
			Fluorene	2022/06/23		84	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/06/23		58	%	50 - 130
			Naphthalene	2022/06/23		89	%	50 - 130
			Perylene	2022/06/23		67	%	50 - 130
			Phenanthrene	2022/06/23		82	%	50 - 130
			Pyrene	2022/06/23		81	%	50 - 130
8069806	LGE	Spiked Blank	D10-Anthracene	2022/06/23		97	%	50 - 130
			D14-Terphenyl	2022/06/23		100	%	50 - 130
			D8-Acenaphthylene	2022/06/23		93	%	50 - 130
			1-Methylnaphthalene	2022/06/23		101	%	50 - 130
			2-Methylnaphthalene	2022/06/23		97	%	50 - 130
			Acenaphthene	2022/06/23		97	%	50 - 130
			Acenaphthylene	2022/06/23		97	%	50 - 130
			Anthracene	2022/06/23		99	%	50 - 130
			Benzo(a)anthracene	2022/06/23		96	%	50 - 130
			Benzo(a)pyrene	2022/06/23		87	%	50 - 130
			Benzo(b)fluoranthene	2022/06/23		97	%	50 - 130
			Benzo(g,h,i)perylene	2022/06/23		88	%	50 - 130
			Benzo(j)fluoranthene	2022/06/23		85	%	50 - 130
			Benzo(k)fluoranthene	2022/06/23		84	%	50 - 130
			Chrysene	2022/06/23		95	%	50 - 130
			Dibenzo(a,h)anthracene	2022/06/23		62	%	50 - 130
			Fluoranthene	2022/06/23		102	%	50 - 130
			Fluorene	2022/06/23		98	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/06/23		82	%	50 - 130
			Naphthalene	2022/06/23		94	%	50 - 130
			Perylene	2022/06/23		86	%	50 - 130
			Phenanthrene	2022/06/23		98	%	50 - 130
			Pyrene	2022/06/23		100	%	50 - 130
8069806	LGE	Method Blank	D10-Anthracene	2022/06/23		98	%	50 - 130
			D14-Terphenyl	2022/06/23		102	%	50 - 130
			D8-Acenaphthylene	2022/06/23		94	%	50 - 130
			1-Methylnaphthalene	2022/06/23	<0.050		ug/L	
			2-Methylnaphthalene	2022/06/23	<0.050		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2022/06/23	<0.010		ug/L	
			Acenaphthylene	2022/06/23	<0.010		ug/L	
			Anthracene	2022/06/23	<0.010		ug/L	
			Benzo(a)anthracene	2022/06/23	<0.010		ug/L	
			Benzo(a)pyrene	2022/06/23	<0.010		ug/L	
			Benzo(b)fluoranthene	2022/06/23	<0.010		ug/L	
			Benzo(g,h,i)perylene	2022/06/23	<0.010		ug/L	
			Benzo(j)fluoranthene	2022/06/23	<0.010		ug/L	
			Benzo(k)fluoranthene	2022/06/23	<0.010		ug/L	
			Chrysene	2022/06/23	<0.010		ug/L	
			Dibenzo(a,h)anthracene	2022/06/23	<0.010		ug/L	
			Fluoranthene	2022/06/23	<0.010		ug/L	
			Fluorene	2022/06/23	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2022/06/23	<0.010		ug/L	
			Naphthalene	2022/06/23	<0.20		ug/L	
			Perylene	2022/06/23	<0.010		ug/L	
			Phenanthrene	2022/06/23	<0.010		ug/L	
			Pyrene	2022/06/23	<0.010		ug/L	
8069806	LGE	RPD	1-Methylnaphthalene	2022/06/23	NC		%	40
			2-Methylnaphthalene	2022/06/23	NC		%	40
			Acenaphthene	2022/06/23	NC		%	40
			Acenaphthylene	2022/06/23	NC		%	40
			Anthracene	2022/06/23	NC		%	40
			Benzo(a)anthracene	2022/06/23	NC		%	40
			Benzo(a)pyrene	2022/06/23	NC		%	40
			Benzo(b)fluoranthene	2022/06/23	NC		%	40
			Benzo(g,h,i)perylene	2022/06/23	NC		%	40
			Benzo(j)fluoranthene	2022/06/23	NC		%	40
			Benzo(k)fluoranthene	2022/06/23	NC		%	40
			Chrysene	2022/06/23	NC		%	40
			Dibenzo(a,h)anthracene	2022/06/23	NC		%	40
			Fluoranthene	2022/06/23	NC		%	40
			Fluorene	2022/06/23	NC		%	40
			Indeno(1,2,3-cd)pyrene	2022/06/23	NC		%	40
			Naphthalene	2022/06/23	NC		%	40
			Perylene	2022/06/23	NC		%	40
			Phenanthrene	2022/06/23	NC		%	40
			Pyrene	2022/06/23	NC		%	40
8070025	JWA	Method Blank	Escherichia coli	2022/06/23	<1.0		CFU/100mL	
			Total Coliforms	2022/06/23	<1.0		CFU/100mL	
8070863	GTH	QC Standard	Total Residual Chlorine	2022/06/24		89	%	80 - 120
8070863	GTH	Method Blank	Total Residual Chlorine	2022/06/24	<0.10		mg/L	
8070863	GTH	RPD	Total Residual Chlorine	2022/06/24	0		%	25
8073179	ASL	Matrix Spike	4-Bromofluorobenzene	2022/06/27		102	%	70 - 130
			D4-1,2-Dichloroethane	2022/06/27		99	%	70 - 130
			D8-Toluene	2022/06/27		93	%	70 - 130
			1,1-Dichloroethane	2022/06/27		101	%	70 - 130
			1,1-Dichloroethylene	2022/06/27		94	%	70 - 130
			1,1,1-Trichloroethane	2022/06/27		100	%	70 - 130
			1,1,2-Trichloroethane	2022/06/27		104	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/06/27		96	%	70 - 130
			Ethylene Dibromide	2022/06/27		104	%	70 - 130
			1,2-Dichlorobenzene	2022/06/27		92	%	70 - 130
			1,2-Dichloroethane	2022/06/27		96	%	70 - 130
			cis-1,2-Dichloroethylene	2022/06/27		103	%	70 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,2-Dichloroethylene	2022/06/27		99	%	70 - 130
			1,2-Dichloropropane	2022/06/27		94	%	70 - 130
			1,3-Dichlorobenzene	2022/06/27		91	%	70 - 130
			cis-1,3-Dichloropropene	2022/06/27		81	%	70 - 130
			trans-1,3-Dichloropropene	2022/06/27		89	%	70 - 130
			1,4-Dichlorobenzene	2022/06/27		86	%	70 - 130
			Benzene	2022/06/27		93	%	70 - 130
			Bromodichloromethane	2022/06/27		95	%	70 - 130
			Bromoform	2022/06/27		102	%	70 - 130
			Bromomethane	2022/06/27		76	%	60 - 140
			Carbon Tetrachloride	2022/06/27		93	%	70 - 130
			Chlorobenzene	2022/06/27		95	%	70 - 130
			Chloroethane	2022/06/27		90	%	60 - 140
			Chloroform	2022/06/27		106	%	70 - 130
			Chloromethane	2022/06/27		87	%	60 - 140
			Dibromochloromethane	2022/06/27		95	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/06/27		100	%	70 - 130
			Ethylbenzene	2022/06/27		89	%	70 - 130
			Methyl t-butyl ether (MTBE)	2022/06/27		99	%	70 - 130
			Styrene	2022/06/27		101	%	70 - 130
			Tetrachloroethylene	2022/06/27		93	%	70 - 130
			Toluene	2022/06/27		92	%	70 - 130
			Trichloroethylene	2022/06/27		93	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2022/06/27		87	%	60 - 140
			Vinyl Chloride	2022/06/27		85	%	60 - 140
			o-Xylene	2022/06/27		91	%	70 - 130
			p+m-Xylene	2022/06/27		87	%	70 - 130
8073179	ASL	Spiked Blank	4-Bromofluorobenzene	2022/06/27		103	%	70 - 130
			D4-1,2-Dichloroethane	2022/06/27		99	%	70 - 130
			D8-Toluene	2022/06/27		93	%	70 - 130
			1,1-Dichloroethane	2022/06/27		102	%	70 - 130
			1,1-Dichloroethylene	2022/06/27		95	%	70 - 130
			1,1,1-Trichloroethane	2022/06/27		101	%	70 - 130
			1,1,2-Trichloroethane	2022/06/27		102	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/06/27		95	%	70 - 130
			Ethylene Dibromide	2022/06/27		99	%	70 - 130
			1,2-Dichlorobenzene	2022/06/27		92	%	70 - 130
			1,2-Dichloroethane	2022/06/27		94	%	70 - 130
			cis-1,2-Dichloroethylene	2022/06/27		105	%	70 - 130
			trans-1,2-Dichloroethylene	2022/06/27		101	%	70 - 130
			1,2-Dichloropropane	2022/06/27		94	%	70 - 130
			1,3-Dichlorobenzene	2022/06/27		91	%	70 - 130
			cis-1,3-Dichloropropene	2022/06/27		89	%	70 - 130
			trans-1,3-Dichloropropene	2022/06/27		99	%	70 - 130
			1,4-Dichlorobenzene	2022/06/27		88	%	70 - 130
			Benzene	2022/06/27		92	%	70 - 130
			Bromodichloromethane	2022/06/27		94	%	70 - 130
			Bromoform	2022/06/27		102	%	70 - 130
			Bromomethane	2022/06/27		79	%	60 - 140
			Carbon Tetrachloride	2022/06/27		93	%	70 - 130
			Chlorobenzene	2022/06/27		97	%	70 - 130
			Chloroethane	2022/06/27		90	%	60 - 140
			Chloroform	2022/06/27		106	%	70 - 130
			Chloromethane	2022/06/27		89	%	60 - 140
			Dibromochloromethane	2022/06/27		93	%	70 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methylene Chloride(Dichloromethane)	2022/06/27		100	%	70 - 130
			Ethylbenzene	2022/06/27		90	%	70 - 130
			Methyl t-butyl ether (MTBE)	2022/06/27		100	%	70 - 130
			Styrene	2022/06/27		103	%	70 - 130
			Tetrachloroethylene	2022/06/27		92	%	70 - 130
			Toluene	2022/06/27		92	%	70 - 130
			Trichloroethylene	2022/06/27		93	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2022/06/27		88	%	60 - 140
			Vinyl Chloride	2022/06/27		87	%	60 - 140
			o-Xylene	2022/06/27		94	%	70 - 130
			p+m-Xylene	2022/06/27		89	%	70 - 130
8073179	ASL	Method Blank	4-Bromofluorobenzene	2022/06/27		100	%	70 - 130
			D4-1,2-Dichloroethane	2022/06/27		95	%	70 - 130
			D8-Toluene	2022/06/27		98	%	70 - 130
			1,1-Dichloroethane	2022/06/27	<2.0		ug/L	
			1,1-Dichloroethylene	2022/06/27	<0.50		ug/L	
			1,1,1-Trichloroethane	2022/06/27	<1.0		ug/L	
			1,1,2-Trichloroethane	2022/06/27	<1.0		ug/L	
			1,1,2,2-Tetrachloroethane	2022/06/27	<0.50		ug/L	
			Ethylene Dibromide	2022/06/27	<0.20		ug/L	
			1,2-Dichlorobenzene	2022/06/27	<0.50		ug/L	
			1,2-Dichloroethane	2022/06/27	<1.0		ug/L	
			cis-1,2-Dichloroethylene	2022/06/27	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2022/06/27	<0.50		ug/L	
			1,2-Dichloropropane	2022/06/27	<0.50		ug/L	
			1,3-Dichlorobenzene	2022/06/27	<1.0		ug/L	
			cis-1,3-Dichloropropene	2022/06/27	<0.50		ug/L	
			trans-1,3-Dichloropropene	2022/06/27	<0.50		ug/L	
			1,4-Dichlorobenzene	2022/06/27	<1.0		ug/L	
			Benzene	2022/06/27	<1.0		ug/L	
			Bromodichloromethane	2022/06/27	<1.0		ug/L	
			Bromoform	2022/06/27	<1.0		ug/L	
			Bromomethane	2022/06/27	<0.50		ug/L	
			Carbon Tetrachloride	2022/06/27	<0.50		ug/L	
			Chlorobenzene	2022/06/27	<1.0		ug/L	
			Chloroethane	2022/06/27	<8.0		ug/L	
			Chloroform	2022/06/27	<1.0		ug/L	
			Chloromethane	2022/06/27	<8.0		ug/L	
			Dibromochloromethane	2022/06/27	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2022/06/27	<3.0		ug/L	
			Ethylbenzene	2022/06/27	<1.0		ug/L	
			Methyl t-butyl ether (MTBE)	2022/06/27	<2.0		ug/L	
			Styrene	2022/06/27	<1.0		ug/L	
			Tetrachloroethylene	2022/06/27	<1.0		ug/L	
			Toluene	2022/06/27	<1.0		ug/L	
			Trichloroethylene	2022/06/27	<1.0		ug/L	
			Trichlorofluoromethane (FREON 11)	2022/06/27	<8.0		ug/L	
			Vinyl Chloride	2022/06/27	<0.50		ug/L	
			o-Xylene	2022/06/27	<1.0		ug/L	
			p+m-Xylene	2022/06/27	<2.0		ug/L	
			Total Xylenes	2022/06/27	<1.0		ug/L	
			Total Trihalomethanes	2022/06/27	<1.0		ug/L	
8073179	ASL	RPD	1,1-Dichloroethane	2022/06/27	NC		%	40
			1,1-Dichloroethylene	2022/06/27	NC		%	40
			1,1,1-Trichloroethane	2022/06/27	NC		%	40

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,2-Trichloroethane	2022/06/27	NC		%	40
			1,1,2,2-Tetrachloroethane	2022/06/27	NC		%	40
			Ethylene Dibromide	2022/06/27	NC		%	40
			1,2-Dichlorobenzene	2022/06/27	NC		%	40
			1,2-Dichloroethane	2022/06/27	NC		%	40
			cis-1,2-Dichloroethylene	2022/06/27	NC		%	40
			trans-1,2-Dichloroethylene	2022/06/27	NC		%	40
			1,2-Dichloropropane	2022/06/27	NC		%	40
			1,3-Dichlorobenzene	2022/06/27	NC		%	40
			cis-1,3-Dichloropropene	2022/06/27	NC		%	40
			trans-1,3-Dichloropropene	2022/06/27	NC		%	40
			1,4-Dichlorobenzene	2022/06/27	NC		%	40
			Benzene	2022/06/27	NC		%	40
			Bromodichloromethane	2022/06/27	NC		%	40
			Bromoform	2022/06/27	NC		%	40
			Bromomethane	2022/06/27	NC		%	40
			Carbon Tetrachloride	2022/06/27	NC		%	40
			Chlorobenzene	2022/06/27	NC		%	40
			Chloroethane	2022/06/27	NC		%	40
			Chloroform	2022/06/27	NC		%	40
			Chloromethane	2022/06/27	NC		%	40
			Dibromochloromethane	2022/06/27	NC		%	40
			Methylene Chloride(Dichloromethane)	2022/06/27	NC		%	40
			Ethylbenzene	2022/06/27	NC		%	40
			Methyl t-butyl ether (MTBE)	2022/06/27	NC		%	40
			Styrene	2022/06/27	NC		%	40
			Tetrachloroethylene	2022/06/27	NC		%	40
			Toluene	2022/06/27	NC		%	40
			Trichloroethylene	2022/06/27	NC		%	40
			Trichlorofluoromethane (FREON 11)	2022/06/27	NC		%	40
			Vinyl Chloride	2022/06/27	NC		%	40
			o-Xylene	2022/06/27	NC		%	40
			p+m-Xylene	2022/06/27	NC		%	40
			Total Xylenes	2022/06/27	NC		%	40
			Total Trihalomethanes	2022/06/27	NC		%	40
8074019	MYI	Matrix Spike [SYY879-01]	2,4,6-Tribromophenol	2022/06/27		89	%	50 - 130
			2-Fluorophenol	2022/06/27		66	%	50 - 130
			D5-Phenol	2022/06/27		39	%	30 - 130
			2-Chlorophenol	2022/06/27		94	%	50 - 130
			2,3,4,6-Tetrachlorophenol	2022/06/27		92	%	10 - 130
			2,3,5-Trichlorophenol	2022/06/27		93	%	10 - 130
			2,4-Dichlorophenol	2022/06/27		93	%	50 - 130
			2,4-Dimethylphenol	2022/06/27		83	%	30 - 130
			2,4,6-Trichlorophenol	2022/06/27		92	%	10 - 130
			2,6-Dichlorophenol	2022/06/27		99	%	10 - 130
			4-Chloro-3-Methylphenol	2022/06/27		82	%	10 - 130
			4-Nitrophenol	2022/06/27		46	%	10 - 130
			m/p-Cresol	2022/06/27		79	%	10 - 130
			o-Cresol	2022/06/27		85	%	10 - 130
			Pentachlorophenol	2022/06/27		87	%	50 - 130
			Phenol	2022/06/27		40	%	30 - 130
			2,3,4,5-Tetrachlorophenol	2022/06/27		98	%	10 - 130
			2,3,5,6-Tetrachlorophenol	2022/06/27		97	%	10 - 130
			2,3,4-Trichlorophenol	2022/06/27		93	%	10 - 130
			2,3,6-Trichlorophenol	2022/06/27		94	%	30 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			2,4,5-Trichlorophenol	2022/06/27		91	%	50 - 130
			3,4,5-Trichlorophenol	2022/06/27		95	%	10 - 130
			2,4-Dinitrophenol	2022/06/27		90	%	30 - 130
			2,3-Dichlorophenol	2022/06/27		92	%	10 - 130
			2,5-Dichlorophenol	2022/06/27		96	%	10 - 130
			3,4-Dichlorophenol	2022/06/27		97	%	10 - 130
			3,5-Dichlorophenol	2022/06/27		96	%	10 - 130
			4,6-Dinitro-2-methylphenol	2022/06/27		90	%	10 - 130
			3 & 4-Chlorophenol	2022/06/27		82	%	10 - 130
			2-Nitrophenol	2022/06/27		87	%	10 - 130
8074019	MYI	Spiked Blank	2,4,6-Tribromophenol	2022/06/27		92	%	50 - 130
			2-Fluorophenol	2022/06/27		66	%	50 - 130
			D5-Phenol	2022/06/27		38	%	30 - 130
			2-Chlorophenol	2022/06/27		99	%	50 - 130
			2,3,4,6-Tetrachlorophenol	2022/06/27		91	%	10 - 130
			2,3,5-Trichlorophenol	2022/06/27		97	%	10 - 130
			2,4-Dichlorophenol	2022/06/27		99	%	50 - 130
			2,4-Dimethylphenol	2022/06/27		91	%	30 - 130
			2,4,6-Trichlorophenol	2022/06/27		96	%	10 - 130
			2,6-Dichlorophenol	2022/06/27		106	%	10 - 130
			4-Chloro-3-Methylphenol	2022/06/27		87	%	10 - 130
			4-Nitrophenol	2022/06/27		42	%	10 - 130
			m/p-Cresol	2022/06/27		82	%	10 - 130
			o-Cresol	2022/06/27		89	%	10 - 130
			Pentachlorophenol	2022/06/27		89	%	50 - 130
			Phenol	2022/06/27		39	%	30 - 130
			2,3,4,5-Tetrachlorophenol	2022/06/27		96	%	10 - 130
			2,3,5,6-Tetrachlorophenol	2022/06/27		102	%	10 - 130
			2,3,4-Trichlorophenol	2022/06/27		95	%	10 - 130
			2,3,6-Trichlorophenol	2022/06/27		97	%	30 - 130
			2,4,5-Trichlorophenol	2022/06/27		93	%	50 - 130
			3,4,5-Trichlorophenol	2022/06/27		97	%	10 - 130
			2,4-Dinitrophenol	2022/06/27		91	%	30 - 130
			2,3-Dichlorophenol	2022/06/27		98	%	10 - 130
			2,5-Dichlorophenol	2022/06/27		102	%	10 - 130
			3,4-Dichlorophenol	2022/06/27		101	%	10 - 130
			3,5-Dichlorophenol	2022/06/27		101	%	10 - 130
			4,6-Dinitro-2-methylphenol	2022/06/27		93	%	10 - 130
			3 & 4-Chlorophenol	2022/06/27		84	%	10 - 130
			2-Nitrophenol	2022/06/27		90	%	10 - 130
8074019	MYI	Method Blank	2,4,6-Tribromophenol	2022/06/27		86	%	50 - 130
			2-Fluorophenol	2022/06/27		61	%	50 - 130
			D5-Phenol	2022/06/27		35	%	30 - 130
			2-Chlorophenol	2022/06/27	<0.1		ug/L	
			2,3,4,6-Tetrachlorophenol	2022/06/27	<0.1		ug/L	
			2,3,5-Trichlorophenol	2022/06/27	<0.1		ug/L	
			2,4-Dichlorophenol	2022/06/27	<0.1		ug/L	
			2,4-Dimethylphenol	2022/06/27	<1		ug/L	
			2,4,6-Trichlorophenol	2022/06/27	<0.1		ug/L	
			2,6-Dichlorophenol	2022/06/27	<0.1		ug/L	
			4-Chloro-3-Methylphenol	2022/06/27	<0.2		ug/L	
			4-Nitrophenol	2022/06/27	<1		ug/L	
			m/p-Cresol	2022/06/27	<0.5		ug/L	
			o-Cresol	2022/06/27	<0.5		ug/L	
			Pentachlorophenol	2022/06/27	<0.1		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Phenol	2022/06/27	<0.5		ug/L	
			2,3,4,5-Tetrachlorophenol	2022/06/27	<0.1		ug/L	
			2,3,5,6-Tetrachlorophenol	2022/06/27	<0.1		ug/L	
			2,3,4-Trichlorophenol	2022/06/27	<0.1		ug/L	
			2,3,6-Trichlorophenol	2022/06/27	<0.1		ug/L	
			2,4,5-Trichlorophenol	2022/06/27	<0.1		ug/L	
			3,4,5-Trichlorophenol	2022/06/27	<0.1		ug/L	
			2,4-Dinitrophenol	2022/06/27	<1		ug/L	
			2,3-Dichlorophenol	2022/06/27	<0.1		ug/L	
			2,5-Dichlorophenol	2022/06/27	<0.1		ug/L	
			3,4-Dichlorophenol	2022/06/27	<0.1		ug/L	
			3,5-Dichlorophenol	2022/06/27	<0.1		ug/L	
			4,6-Dinitro-2-methylphenol	2022/06/27	<1		ug/L	
			3 & 4-Chlorophenol	2022/06/27	<0.1		ug/L	
			2-Nitrophenol	2022/06/27	<1		ug/L	
8074019	MYI	RPD	2-Chlorophenol	2022/06/27	NC		%	30
			2,4-Dichlorophenol	2022/06/27	NC		%	30
			2,4,6-Trichlorophenol	2022/06/27	NC		%	30
			Pentachlorophenol	2022/06/27	NC		%	30
			2,4,5-Trichlorophenol	2022/06/27	NC		%	30
8074223	GYA	Matrix Spike	Total Cyanide (CN)	2022/06/24		96	%	80 - 120
8074223	GYA	Spiked Blank	Total Cyanide (CN)	2022/06/24		96	%	80 - 120
8074223	GYA	Method Blank	Total Cyanide (CN)	2022/06/24	<0.0050		mg/L	
8074223	GYA	RPD	Total Cyanide (CN)	2022/06/24	NC		%	20
8076183	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2022/06/27		85	%	80 - 120
8076183	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2022/06/27		92	%	80 - 120
8076183	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2022/06/27	<0.050		mg/L	
8076183	MCN	RPD	Nitrogen (Ammonia Nitrogen)	2022/06/27	NC		%	20
8076367	MCN	Matrix Spike	Nitrate + Nitrite (N)	2022/06/28		98	%	80 - 120
8076367	MCN	Spiked Blank	Nitrate + Nitrite (N)	2022/06/28		99	%	80 - 120
8076367	MCN	Method Blank	Nitrate + Nitrite (N)	2022/06/28	<0.050		mg/L	
8076367	MCN	RPD	Nitrate + Nitrite (N)	2022/06/28	NC		%	20
8076369	MCN	Matrix Spike	Nitrite (N)	2022/06/28		96	%	80 - 120
8076369	MCN	Spiked Blank	Nitrite (N)	2022/06/28		106	%	80 - 120
8076369	MCN	Method Blank	Nitrite (N)	2022/06/29	<0.010		mg/L	
8076369	MCN	RPD	Nitrite (N)	2022/06/28	NC		%	20
8077362	MJ1	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2022/06/28		95	%	80 - 120
8077362	MJ1	QC Standard	Total Kjeldahl Nitrogen (TKN)	2022/06/28		96	%	80 - 120
8077362	MJ1	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2022/06/28		99	%	80 - 120
8077362	MJ1	Method Blank	Total Kjeldahl Nitrogen (TKN)	2022/06/28	<0.10		mg/L	
8077362	MJ1	RPD	Total Kjeldahl Nitrogen (TKN)	2022/06/28	NC (3)		%	20
8078427	NGI	Spiked Blank	pH	2022/06/28		100	%	97 - 103
8078427	NGI	RPD	pH	2022/06/28	0.15		%	N/A
8078433	NGI	Matrix Spike	Dissolved Fluoride (F-)	2022/06/28		92	%	80 - 120
8078433	NGI	Spiked Blank	Dissolved Fluoride (F-)	2022/06/28		101	%	80 - 120
8078433	NGI	Method Blank	Dissolved Fluoride (F-)	2022/06/28	<0.10		mg/L	
8078433	NGI	RPD	Dissolved Fluoride (F-)	2022/06/28	NC		%	20
8078509	EPU	Matrix Spike	Total Mercury (Hg)	2022/06/29		100	%	80 - 120
8078509	EPU	Spiked Blank	Total Mercury (Hg)	2022/06/29		99	%	80 - 120
8078509	EPU	Method Blank	Total Mercury (Hg)	2022/06/29	<0.013		ug/L	
8078509	EPU	RPD	Total Mercury (Hg)	2022/06/29	NC		%	20
8081033	LPG	Matrix Spike [SYY879-17]	2,4,5,6-Tetrachloro-m-xylene	2022/06/29		82	%	30 - 130
			Decachlorobiphenyl	2022/06/29		97	%	30 - 130
			Lindane	2022/06/29		98	%	30 - 130
			Heptachlor	2022/06/29		88	%	30 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aldrin	2022/06/29		82	%	30 - 130
			Heptachlor epoxide	2022/06/29		97	%	30 - 130
			Oxychlordane	2022/06/29		89	%	30 - 130
			g-Chlordane	2022/06/29		94	%	30 - 130
			a-Chlordane	2022/06/29		94	%	30 - 130
			Dieldrin	2022/06/29		109	%	30 - 130
			o,p-DDE	2022/06/29		111	%	30 - 130
			p,p-DDE	2022/06/29		93	%	30 - 130
			o,p-DDD	2022/06/29		99	%	30 - 130
			p,p-DDD	2022/06/29		100	%	30 - 130
			o,p-DDT	2022/06/29		99	%	30 - 130
			p,p-DDT	2022/06/29		104	%	30 - 130
			Methoxychlor	2022/06/29		102	%	30 - 130
8081033	LPG	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2022/06/29		86	%	30 - 130
			Decachlorobiphenyl	2022/06/29		103	%	30 - 130
			Lindane	2022/06/29		106	%	30 - 130
			Heptachlor	2022/06/29		80	%	30 - 130
			Aldrin	2022/06/29		78	%	30 - 130
			Heptachlor epoxide	2022/06/29		106	%	30 - 130
			Oxychlordane	2022/06/29		94	%	30 - 130
			g-Chlordane	2022/06/29		99	%	30 - 130
			a-Chlordane	2022/06/29		98	%	30 - 130
			Dieldrin	2022/06/29		113	%	30 - 130
			o,p-DDE	2022/06/29		113	%	30 - 130
			p,p-DDE	2022/06/29		96	%	30 - 130
			o,p-DDD	2022/06/29		105	%	30 - 130
			p,p-DDD	2022/06/29		103	%	30 - 130
			o,p-DDT	2022/06/29		95	%	30 - 130
			p,p-DDT	2022/06/29		98	%	30 - 130
			Methoxychlor	2022/06/29		100	%	30 - 130
8081033	LPG	RPD	Lindane	2022/06/29	0.32		%	40
			Heptachlor	2022/06/29	1.0		%	40
			Aldrin	2022/06/29	4.5		%	40
			Heptachlor epoxide	2022/06/29	0.44		%	40
			Oxychlordane	2022/06/29	0.15		%	40
			g-Chlordane	2022/06/29	0.34		%	40
			a-Chlordane	2022/06/29	1.1		%	40
			Dieldrin	2022/06/29	1.9		%	40
			o,p-DDE	2022/06/29	2.8		%	40
			p,p-DDE	2022/06/29	0.40		%	40
			o,p-DDD	2022/06/29	15		%	40
			p,p-DDD	2022/06/29	0.71		%	40
			o,p-DDT	2022/06/29	0.032		%	40
			p,p-DDT	2022/06/29	1.4		%	40
			Methoxychlor	2022/06/29	5.0		%	40
8081033	LPG	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2022/06/29		86	%	30 - 130
			Decachlorobiphenyl	2022/06/29		104	%	30 - 130
			Lindane	2022/06/29	<0.0060		ug/L	
			Heptachlor	2022/06/29	<0.0060		ug/L	
			Aldrin	2022/06/29	<0.0060		ug/L	
			Heptachlor epoxide	2022/06/29	<0.0060		ug/L	
			Oxychlordane	2022/06/29	<0.0060		ug/L	
			g-Chlordane	2022/06/29	<0.0060		ug/L	
			a-Chlordane	2022/06/29	<0.0060		ug/L	
			Dieldrin	2022/06/29	<0.0060		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			o,p-DDE	2022/06/29	<0.0060		ug/L	
			p,p-DDE	2022/06/29	<0.0060		ug/L	
			o,p-DDD	2022/06/29	<0.0060		ug/L	
			p,p-DDD	2022/06/29	<0.0060		ug/L	
			o,p-DDT	2022/06/29	<0.0060		ug/L	
			p,p-DDT	2022/06/29	<0.0060		ug/L	
			Methoxychlor	2022/06/29	<0.024		ug/L	
			Aroclor 1016	2022/06/29	<0.050		ug/L	
			Aroclor 1221	2022/06/29	<0.050		ug/L	
			Aroclor 1232	2022/06/29	<0.050		ug/L	
			Aroclor 1242	2022/06/29	<0.050		ug/L	
			Aroclor 1248	2022/06/29	<0.050		ug/L	
			Aroclor 1254	2022/06/29	<0.050		ug/L	
			Aroclor 1260	2022/06/29	<0.050		ug/L	
8081404	RMK	QC Standard	Total Suspended Solids	2022/07/04		98	%	80 - 120
8081404	RMK	Method Blank	Total Suspended Solids	2022/07/04	<1.0		mg/L	
8081404	RMK	RPD	Total Suspended Solids	2022/07/04	14		%	20
8087480	ZZH	Matrix Spike	Total Chemical Oxygen Demand	2022/07/04		105	%	80 - 120
8087480	ZZH	QC Standard	Total Chemical Oxygen Demand	2022/07/04		99	%	80 - 120
8087480	ZZH	Spiked Blank	Total Chemical Oxygen Demand	2022/07/04		103	%	80 - 120
8087480	ZZH	Method Blank	Total Chemical Oxygen Demand	2022/07/04	<20		mg/L	
8087480	ZZH	RPD	Total Chemical Oxygen Demand	2022/07/04	0		%	25
8088105	JHY	Matrix Spike	Total Aluminum (Al)	2022/07/06		98	%	80 - 120
			Total Antimony (Sb)	2022/07/06		105	%	80 - 120
			Total Arsenic (As)	2022/07/06		93	%	80 - 120
			Total Barium (Ba)	2022/07/06		94	%	80 - 120
			Total Beryllium (Be)	2022/07/06		100	%	80 - 120
			Total Bismuth (Bi)	2022/07/06		96	%	80 - 120
			Total Boron (B)	2022/07/06		101	%	80 - 120
			Total Cadmium (Cd)	2022/07/06		95	%	80 - 120
			Total Calcium (Ca)	2022/07/06		101	%	80 - 120
			Total Chromium (Cr)	2022/07/06		94	%	80 - 120
			Total Cobalt (Co)	2022/07/06		94	%	80 - 120
			Total Copper (Cu)	2022/07/06		94	%	80 - 120
			Total Iron (Fe)	2022/07/06		99	%	80 - 120
			Total Lead (Pb)	2022/07/06		94	%	80 - 120
			Total Magnesium (Mg)	2022/07/06		98	%	80 - 120
			Total Manganese (Mn)	2022/07/06		NC	%	80 - 120
			Total Molybdenum (Mo)	2022/07/06		103	%	80 - 120
			Total Nickel (Ni)	2022/07/06		94	%	80 - 120
			Total Phosphorus (P)	2022/07/06		102	%	80 - 120
			Total Potassium (K)	2022/07/06		99	%	80 - 120
			Total Selenium (Se)	2022/07/06		95	%	80 - 120
			Total Silver (Ag)	2022/07/06		96	%	80 - 120
			Total Sodium (Na)	2022/07/06		NC	%	80 - 120
			Total Strontium (Sr)	2022/07/06		NC	%	80 - 120
			Total Thallium (Tl)	2022/07/06		96	%	80 - 120
			Total Tin (Sn)	2022/07/06		100	%	80 - 120
			Total Titanium (Ti)	2022/07/06		100	%	80 - 120
			Total Uranium (U)	2022/07/06		100	%	80 - 120
			Total Vanadium (V)	2022/07/06		95	%	80 - 120
			Total Zinc (Zn)	2022/07/06		93	%	80 - 120
8088105	JHY	Spiked Blank	Total Aluminum (Al)	2022/07/06		101	%	80 - 120
			Total Antimony (Sb)	2022/07/06		104	%	80 - 120
			Total Arsenic (As)	2022/07/06		91	%	80 - 120

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Barium (Ba)	2022/07/06		96	%	80 - 120
			Total Beryllium (Be)	2022/07/06		97	%	80 - 120
			Total Bismuth (Bi)	2022/07/06		98	%	80 - 120
			Total Boron (B)	2022/07/06		98	%	80 - 120
			Total Cadmium (Cd)	2022/07/06		96	%	80 - 120
			Total Calcium (Ca)	2022/07/06		104	%	80 - 120
			Total Chromium (Cr)	2022/07/06		95	%	80 - 120
			Total Cobalt (Co)	2022/07/06		95	%	80 - 120
			Total Copper (Cu)	2022/07/06		94	%	80 - 120
			Total Iron (Fe)	2022/07/06		103	%	80 - 120
			Total Lead (Pb)	2022/07/06		99	%	80 - 120
			Total Magnesium (Mg)	2022/07/06		102	%	80 - 120
			Total Manganese (Mn)	2022/07/06		99	%	80 - 120
			Total Molybdenum (Mo)	2022/07/06		103	%	80 - 120
			Total Nickel (Ni)	2022/07/06		96	%	80 - 120
			Total Phosphorus (P)	2022/07/06		104	%	80 - 120
			Total Potassium (K)	2022/07/06		103	%	80 - 120
			Total Selenium (Se)	2022/07/06		95	%	80 - 120
			Total Silver (Ag)	2022/07/06		97	%	80 - 120
			Total Sodium (Na)	2022/07/06		98	%	80 - 120
			Total Strontium (Sr)	2022/07/06		97	%	80 - 120
			Total Thallium (Tl)	2022/07/06		101	%	80 - 120
			Total Tin (Sn)	2022/07/06		100	%	80 - 120
			Total Titanium (Ti)	2022/07/06		100	%	80 - 120
			Total Uranium (U)	2022/07/06		102	%	80 - 120
			Total Vanadium (V)	2022/07/06		95	%	80 - 120
			Total Zinc (Zn)	2022/07/06		96	%	80 - 120
8088105	JHY	Method Blank	Total Aluminum (Al)	2022/07/06	<5.0		ug/L	
			Total Antimony (Sb)	2022/07/06	<1.0		ug/L	
			Total Arsenic (As)	2022/07/06	<1.0		ug/L	
			Total Barium (Ba)	2022/07/06	<1.0		ug/L	
			Total Beryllium (Be)	2022/07/06	<0.10		ug/L	
			Total Bismuth (Bi)	2022/07/06	<2.0		ug/L	
			Total Boron (B)	2022/07/06	<50		ug/L	
			Total Cadmium (Cd)	2022/07/06	<0.010		ug/L	
			Total Calcium (Ca)	2022/07/06	<100		ug/L	
			Total Chromium (Cr)	2022/07/06	<1.0		ug/L	
			Total Cobalt (Co)	2022/07/06	<0.40		ug/L	
			Total Copper (Cu)	2022/07/06	<0.50		ug/L	
			Total Iron (Fe)	2022/07/06	<50		ug/L	
			Total Lead (Pb)	2022/07/06	<0.50		ug/L	
			Total Magnesium (Mg)	2022/07/06	<100		ug/L	
			Total Manganese (Mn)	2022/07/06	<2.0		ug/L	
			Total Molybdenum (Mo)	2022/07/06	<2.0		ug/L	
			Total Nickel (Ni)	2022/07/06	<2.0		ug/L	
			Total Phosphorus (P)	2022/07/06	<100		ug/L	
			Total Potassium (K)	2022/07/06	<100		ug/L	
			Total Selenium (Se)	2022/07/06	<0.50		ug/L	
			Total Silver (Ag)	2022/07/06	<0.10		ug/L	
			Total Sodium (Na)	2022/07/06	<100		ug/L	
			Total Strontium (Sr)	2022/07/06	<2.0		ug/L	
			Total Thallium (Tl)	2022/07/06	<0.10		ug/L	
			Total Tin (Sn)	2022/07/06	<2.0		ug/L	
			Total Titanium (Ti)	2022/07/06	<2.0		ug/L	
			Total Uranium (U)	2022/07/06	<0.10		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Vanadium (V)	2022/07/06	<2.0		ug/L	
			Total Zinc (Zn)	2022/07/06	<5.0		ug/L	
8088105	JHY	RPD [SYY879-06]	Total Aluminum (Al)	2022/07/06	NC		%	20
			Total Antimony (Sb)	2022/07/06	NC		%	20
			Total Arsenic (As)	2022/07/06	NC		%	20
			Total Barium (Ba)	2022/07/06	NC		%	20
			Total Beryllium (Be)	2022/07/06	NC		%	20
			Total Bismuth (Bi)	2022/07/06	NC		%	20
			Total Boron (B)	2022/07/06	2.9		%	20
			Total Cadmium (Cd)	2022/07/06	NC		%	20
			Total Calcium (Ca)	2022/07/06	3.2		%	20
			Total Chromium (Cr)	2022/07/06	NC		%	20
			Total Cobalt (Co)	2022/07/06	NC		%	20
			Total Copper (Cu)	2022/07/06	NC		%	20
			Total Iron (Fe)	2022/07/06	NC		%	20
			Total Lead (Pb)	2022/07/06	NC		%	20
			Total Magnesium (Mg)	2022/07/06	0.36		%	20
			Total Manganese (Mn)	2022/07/06	NC		%	20
			Total Molybdenum (Mo)	2022/07/06	NC		%	20
			Total Nickel (Ni)	2022/07/06	NC		%	20
			Total Phosphorus (P)	2022/07/06	NC		%	20
			Total Potassium (K)	2022/07/06	0.98		%	20
			Total Selenium (Se)	2022/07/06	NC		%	20
			Total Silver (Ag)	2022/07/06	NC		%	20
			Total Sodium (Na)	2022/07/06	0.31		%	20
			Total Strontium (Sr)	2022/07/06	0.98		%	20
			Total Thallium (Tl)	2022/07/06	NC		%	20
			Total Tin (Sn)	2022/07/06	NC		%	20
			Total Titanium (Ti)	2022/07/06	NC		%	20
			Total Uranium (U)	2022/07/06	0.74		%	20
			Total Vanadium (V)	2022/07/06	NC		%	20
			Total Zinc (Zn)	2022/07/06	NC		%	20
8092772	EMT	Matrix Spike	Total Phosphorus	2022/07/08		100	%	80 - 120
8092772	EMT	Spiked Blank	Total Phosphorus	2022/07/08		94	%	80 - 120
8092772	EMT	Method Blank	Total Phosphorus	2022/07/08	<0.020		mg/L	
8092772	EMT	RPD	Total Phosphorus	2022/07/08	NC		%	25

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) CBOD Analysis: Reference Material recovery and Second source QC recovery high. All other QC acceptable.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(3) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Colleen Acker, B.Sc, Scientific Service Specialist

Phil Deveau, Scientific Specialist (Organics)

Robyn Edwards, Bedford Micro Supervisor

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Your Project #: 19-1742
Your C.O.C. #: 884405-01-01

Attention: Paul Koke

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/06/24
Report #: R7184714
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C2H2923
Received: 2022/06/22, 13:40

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
TC/EC Non Drinking Water CFU/100mL	1	N/A	2022/06/23	ATL SOP 00096	MOE E3407 R2

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 19-1742
Your C.O.C. #: 884405-01-01

Attention: Paul Koke

Dillon Consulting Limited
137 Chain Lake Dr
Suite 100
Halifax , NS
CANADA B3S 1B3

Report Date: 2022/06/24
Report #: R7184714
Version: 1 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BUREAU VERITAS JOB #: C2H2923
Received: 2022/06/22, 13:40

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Preeti Kapadia, Project Manager
Email: Preeti.Kapadia@bureauveritas.com
Phone# (902)420-0203 Ext:252
==========
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

MICROBIOLOGY (WATER)

Bureau Veritas ID		SYY879		
Sampling Date		2022/06/22 11:20		
COC Number		884405-01-01		
	UNITS	RWS1	RDL	QC Batch
Microbiological				
Escherichia coli	CFU/100mL	<1.0	1.0	8070025
Total Coliforms	CFU/100mL	<1.0	1.0	8070025

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.3°C

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Bureau Veritas Job #: C2H2923
Report Date: 2022/06/24

Dillon Consulting Limited
Client Project #: 19-1742

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8070025	JWA	Method Blank	Escherichia coli	2022/06/23	<1.0		CFU/100mL	
			Total Coliforms	2022/06/23	<1.0		CFU/100mL	

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Robyn Edwards

Robyn Edwards, Bedford Micro Supervisor

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvlabs.com

Appendix D

Effluent Quality Objectives

D- 1: Environmental Quality Objectives

			Effluent Quality Objectives				
	SOPC	Unit	Atlantic RBCA	CCME MAL	EPA Saltwater	Measured Average	Selected EQO
Inorganic Parameters	Arsenic	mg/L	0.0125	0.0125	0.036	0.01	0.0125
	Cadmium	mg/L	0.00012	0.00012	0.0079	0.0001	0.00012
	Chromium (hexavalent)	mg/L	0.0015	0.0015	0.05	tbd	tbd
	Chromium (total)	mg/L	0.056	-	-	0.01	0.056
	Cobalt	mg/L	0.004	-	-	0.004	0.004
	Copper	mg/L	0.002	-	0.0031	0.005	0.005
	Lead	mg/L	0.002	-	0.0081	0.005	0.005
	Mercury (total)	mg/L	0.000016	0.000016	0.00094	0.000013	0.000016
	Nickel	mg/L	0.0083	-	0.0082	0.02	0.02
	Selenium	mg/L	0.002	-	0.071	0.005	0.005
	Vanadium	mg/L	0.005	-	-	0.02	0.02
	Zinc	mg/L	0.01	-	0.081	0.05	0.05
General Chemistry Parameters	Total Ammonia Nitrogen (Total NH3-N)	mg/L	1.1	-	-	0.086	1.1
	Carbonaceous Biochemical Oxygen Demand (CBOD5)	mg/L	-	25	-	3.9	25
	Chloride	mg/L	Narrative	NRG	-	9,000	9,000*
	Fluoride	mg/L	1.5	NRG	-	0.555	1.5
	Nitrate (as N)	mg/L	200	45	-	0.05	45
	Nitrite (as N)	mg/L	-	-	-	0.0115	0.0115
	Total Phosphorus (TP)	mg/L	-	0.1	-	0.026	0.1
	pH	Units	7.0 - 8.7	7.0 - 8.7	6.5 – 8.5	7.945	7.0 - 8.7
	Sodium	mg/L	-	-	-	8,800	8,800
	Sulphates (background)	mg/L	-	-	-	1,300	1,300*
	Total Suspended Solids (TSS)	mg/L	-	Narrative	-	7	32
	Total Dissolved Solids (TDS)	mg/L	-	-	-	20,000	20,000*
Petroleum Hydrocarbons (PHC) Parameters	Benzene	mg/L	2.1	0.11	-		0.11
	Toluene	mg/L	0.77	0.215	-		0.215
	Ethylbenzene	mg/L	0.32	0.025	-		0.025
	Xylene	mg/L	0.33	-	-		0.33
	Modified TPH (Gas)	mg/L	1.5	-	-		1.5
	Modified TPH (Fuel)	mg/L	0.1	-	-		0.1
	Modified TPH (Lube)	mg/L	0.1	-	-		0.1
Polycyclic Aromatic Hydrocarbons (PAH) Parameters Non-Carcinogenic PAH Compounds	Naphthalene	mg/L	0.0014	0.0014	-		0.0014
	1 - Methylnaphthalene	mg/L	0.001	-	-		0.001
	2 - Methylnaphthalene	mg/L	0.001	-	-		0.001
	Acenaphthene	mg/L	0.006	-	-		0.006
	Anthracene	mg/L	0.0001	-	-		0.0001
	Fluoranthene	mg/L	0.0002	-	-		0.0002
	Fluorene	mg/L	0.012	-	-		0.012
	Phenanthrene	mg/L	0.0003	-	-	0.0000135	0.0003
	Pyrene	mg/L	0.00002	-	-		0.00002
Carcinogenic PAH Compounds	Benzo(a)pyrene	mg/L	0.00001	-	-		0.00001
	Chrysene	mg/L	0.0001	-	-		0.0001
Limited Volatile Organic Compound (VOC) Parameters	Tetrachloroethylene	mg/L	0.11	-	-	0.001	0.11
	Trichloroethylene	mg/L	0.02	-	-	0.001	0.02
Other Parameters	Ethylene Glycol	mg/L	192	-	-		192
	Propylene Glycol	mg/L	500	-	-		500
	Phenol (background)	mg/L	0.2	-	-		0.2

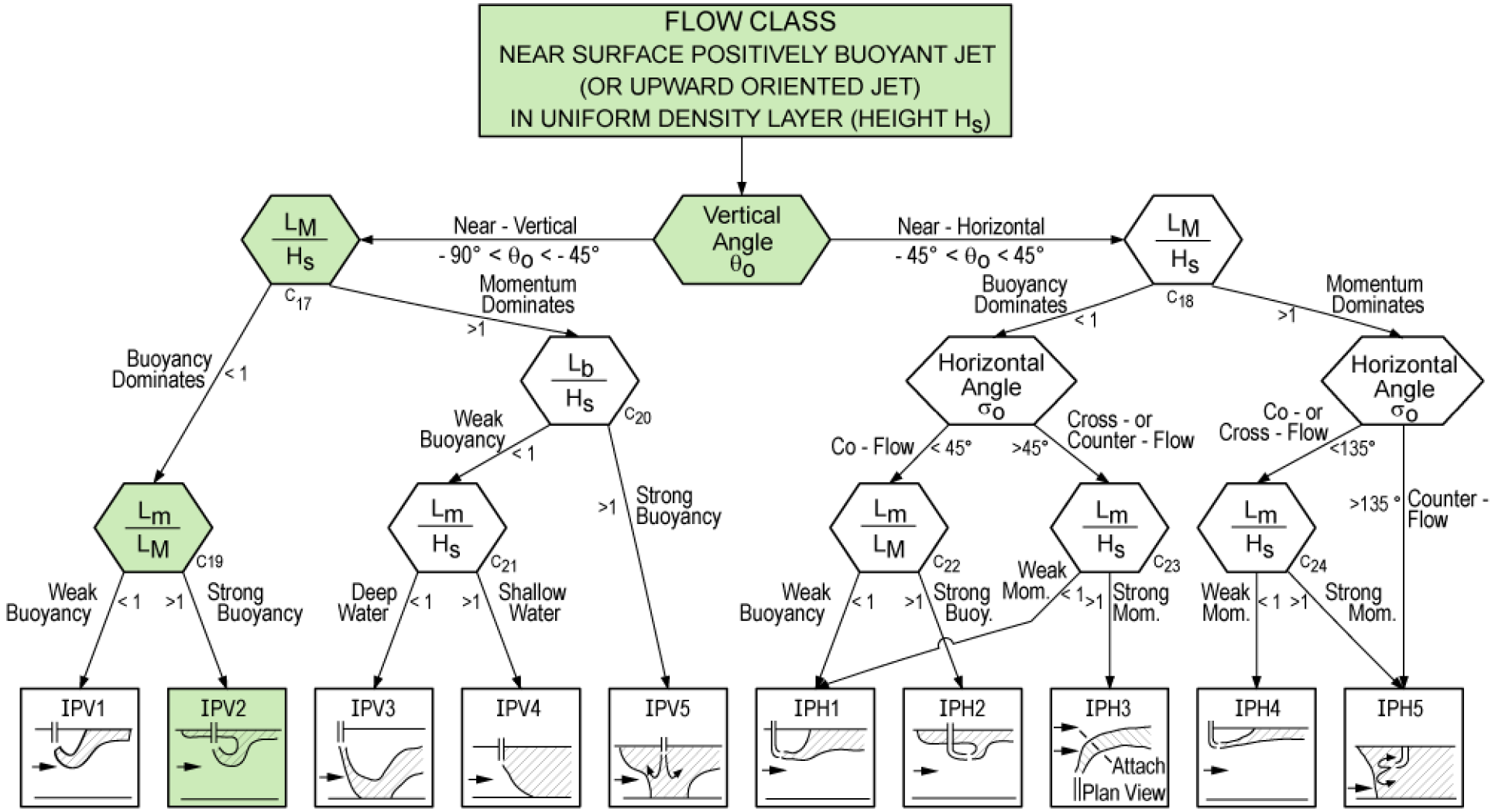
** Typical values for marine water in Atlantic Canada*

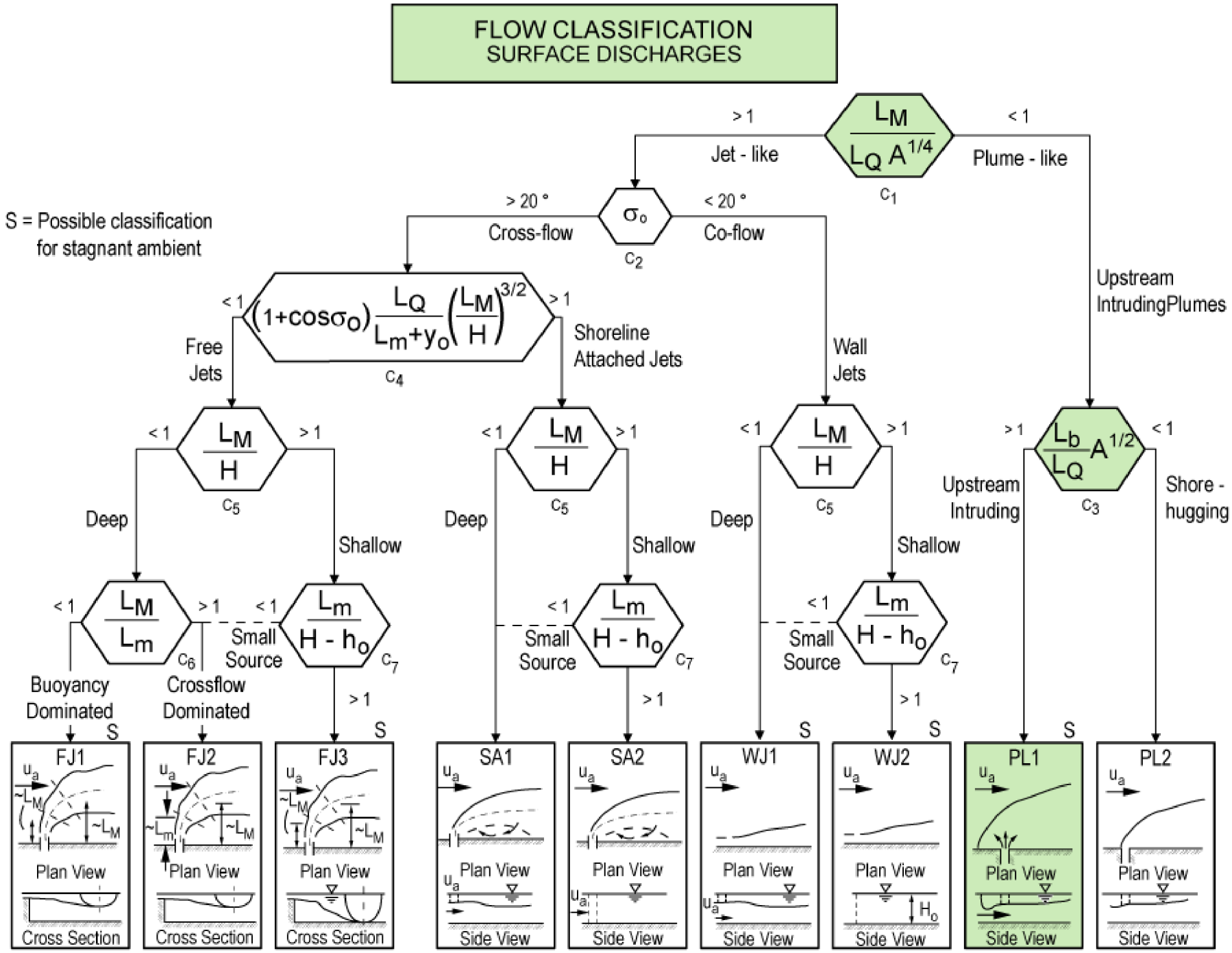
Appendix E

CORMIX Classification Tree

Follow the GREEN Highlighted Path along the Decision Tree to determine how CORMIX arrived at this flow class.

Flow Class Description – CLICK TO VIEW




FLOW CLASSIFICATION
SURFACE DISCHARGES
S = Possible classification for stagnant ambient
$\frac{L_M}{L_Q A^{1/4}}$
c1
> 1
Jet - like
< 1
Plume - like
σ_o
c2
> 20 °
Cross-flow
< 20 °
Co-flow
$(1+\cos\sigma_o)\frac{L_Q}{L_m+y_o}\left(\frac{L_M}{H}\right)^{3/2}$
c4
< 1
Free Jets
> 1
Shoreline Attached Jets
Wall Jets
Upstream IntrudingPlumes
$\frac{L_M}{H}$
c5
$\frac{L_b}{L_Q} A^{1/2}$
c3
Deep
Shallow
Upstream Intruding
Shore - hugging
$\frac{L_M}{L_m}$
c6
$\frac{L_m}{H - h_o}$
c7
Small Source
Buoyancy Dominated
Crossflow Dominated
S
FJ1
FJ2
FJ3
SA1
SA2
WJ1
WJ2
PL1
PL2
Plan View
Cross Section
Side View

Appendix F

Effluent Discharge Objective

F-1: Environmental Discharge Objectives

	SOPC	Unit	Selected EQO	Dilution Ratio	EDO [4]
Inorganic Parameters	Arsenic	mg/L	0.0125	753	2.3
	Cadmium	mg/L	0.00012	753	0.019
	Chromium (hexavalent)	mg/L	tbd	tbd	tbd
	Chromium (total)	mg/L	0.056	753	42
	Cobalt[2]	mg/L	0.004	1	0.005
	Copper[2]	mg/L	0.005	1	0.006
	Lead[2]	mg/L	0.005	1	0.006
	Mercury (total)	mg/L	0.000016	753	0.003
	Nickel[2]	mg/L	0.02	1	0.024
	Selenium[2]	mg/L	0.005	1	0.006
	Vanadium[2]	mg/L	0.02	1	0.024
	Zinc[2]	mg/L	0.05	1	0.061
General Chemistry Parameters	Total Ammonia Nitrogen (Total NH3-N)	mg/L	1.1	753	930
	Carbonaceous Biochemical Oxygen Demand (CBOD5)	mg/L	25	1	38
	Chloride[2]	mg/L	9,000	1	11,000
	Fluoride	mg/L	1.5	753	870
	Nitrate (as N)	mg/L	45	753	41,000
	Nitrite (as N)[1]	mg/L	0.0115	1	0.014
	Total Phosphorus (TP)	mg/L	0.1	753	68
	pH	Units	7.0 - 8.7	-	6.8 - 8.9
	Sodium[1]	mg/L	8800	1	11,000
	Sulphates (background)[1]	mg/L	1,300	1	1,600
	Total Suspended Solids (TSS)	mg/L	32	1	41
	Total Dissolved Solids (TDS)[1]	mg/L	20,000	1	26,000
Petroleum Hydrocarbons (PHC) Parameters	Benzene	mg/L	0.11	753	112
	Toluene	mg/L	0.215	753	219
	Ethylbenzene	mg/L	0.025	753	25
	Xylene	mg/L	0.33	753	336
	Modified TPH (Gas)	mg/L	1.5	753	27
	Modified TPH (Fuel)	mg/L	0.1	753	41
	Modified TPH (Lube)	mg/L	0.1	753	27
Polycyclic Aromatic Hydrocarbons (PAH) Parameters Non-Carcinogenic PAH Compounds	Naphthalene	mg/L	0.0014	753	1.6
	1 - Methylnaphthalene	mg/L	0.001	753	1.1
	2 - Methylnaphthalene	mg/L	0.001	753	1.1
	Acenaphthene[3]	mg/L	0.006	753	5,300
	Anthracene	mg/L	0.0001	753	0.1
	Fluoranthene[3]	mg/L	0.0002	753	0.2
	Fluorene[3]	mg/L	0.012	753	2.3
	Phenanthrene	mg/L	0.0003	753	0.3
	Pyrene	mg/L	0.00002	753	0.02
Carcinogenic PAH Compounds	Benzo(a)pyrene[3]	mg/L	0.00001	753	0.002
	Chrysene[3]	mg/L	0.0001	753	0.002
Limited Volatile Organic Compound (VOC) Parameters	Tetrachloroethylene	mg/L	0.11	753	123
	Trichloroethylene	mg/L	0.02	753	21
Other Parameters	Ethylene Glycol	mg/L	192	753	220,000
	Propylene Glycol	mg/L	500	753	560,000
	Phenol (background)	mg/L	0.2	753	226

[1] parameters which have no regulatory guideline, therefore background = EQO = EDO

[2] parameters in which background concentrations are greater than regulatory guidelines, therefore background = EQO = EDO

[3] approaching solubility limits, EDO set to less than the solubility limit

[4] EDO including analytical precision adjustment

References

Atlantic Risk-Based Corrective Action RBCA (2022). Ecological Tier I Environmental Quality Standards (EQS) for Surface Water.

Bedford Institute of Oceanography. WebTide Tidal Prediction Model. Retrieved from: https://www.bio.gc.ca/science/research-recherche/ocean/webtide/index-en.php

Canadian Hydrographic Service, 1996. Chart 4202.

CCME (2007). Canadian Guidance Framework for the Management of Nutrients in Nearshore Marine Systems Scientific Supporting Document.

CCME (2008). Technical Supplement 3. Canada-wide Strategy for the Management of Municipal Wastewater Effluent. Standard Method and Contracting Provisions for the Environmental Risk Assessment.

DFO. Shellfish Harvesting Map. Retrieved from: https://www.dfo-mpo.gc.ca/shellfish-mollusques/cssp-map-eng.htm

ACWWA. 2006. Atlantic Canada Wastewater Guidelines Manual for Collection, Treatment, and Disposal.

USEPA. National Recommended Water Quality Criteria for Saltwater. Retrieved from: http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm

Appendix G

Emergency Response and Contingency Plan – Draft (Updated)

CONTINGENCY AND EMERGENCY RESPONSE PLAN (DRAFT)

Envirosoil Limited

Waste Oil Recycling and Water Treatment Facility

Dartmouth, Nova Scotia

September 2022

Revision Tracking Sheet

Revision Description	Revision No.	Revised By	Pages	Date of Revision	Comments

Table of Contents

1 Introduction

Envirosoil Limited (Envirosoil) plans to operate a Waste Oil Recycling and Water Treatment Facility ("the project" or "the facility"), located at 750 Pleasant Street in Dartmouth, Nova Scotia ("the site"). The site currently operates as a Liquid Asphalt Storage Facility, operated by General Liquids Canada, and regulated by Nova Scotia Environment. The property identification numbers (also referred to as PIDs) for the site are 41464280 and 00260703. The facility will be used for receiving and processing liquid waste materials, including but not limited to, bilge waters, surface water spills, and used oil. As Envirosoil is an ISO 9001 and 14000 certified company, a system of occupational health and safety and environmental management is built into the company's day-to-day operations and has developed a culture of safety for planning for and responding to emergencies.

The following document provides Emergency Preparedness (or Contingency) Planning information for the facility, meeting the requirements under the Nova Scotia Environment Act respecting the receiving, processing and storage of liquid waste materials, as well as the treatment of water. Details included in the Province of Nova Scotia's Contingency Planning Guidelines (dated October 2019) were adhered to in developing this document. The plan provides procedures for reporting, containing, removing, and cleaning up events that may result in reasonably foreseeable sudden or gradual release of a substance that is likely to have an adverse effect to the environment, including human health.

This Emergency and Contingency Plan was completed in February 2021.

1.1 Policy Statement

Envirosoil Limited is committed to operating the facility in an environmentally responsible manner consistent with its environmental policy. Envirosoil will implement project planning and management strategies that:

- Avoid or minimize the adverse environmental effects of the project, and enhance positive ones;
- Comply with the applicable laws and regulations; and
- Consider the presence of the project and compatibility with the way of life of the surrounding environment.

Every effort shall be made to protect the assets of the Company, but at no time shall the protection of such assets compromise the safety of personnel. The objective of instituting this plan is to ensure effective and efficient response to emergencies. This will help to prevent injuries, reduce property damage and minimize downtime or production setbacks.

2 Planning

2.1 Hazard Assessment

The following describes the possible Transportation of Dangerous Good (TDG) regulated and non-regulated materials anticipated to be processed on site.

Materials	Estimated Annual Volume (m^3) Processed	Dangerous/waste dangerous goods type, name, CAS and UN Number	Maximum Storage Capacity / good type	Material Storage Locations
Waste Oil as defined by the NS *Used Oil Regulations*	3,000 – 8,000	*	*	**
Wastewater from Treatment of Waste Oil (generated internally)	1,000 – 2,500	*	*	**
Marine Bilge Waters	1,000 – 2,500	*	*	**
Wastewater – Hydrocarbon Contaminated	1,000 – 3,000	*	*	**
Wastewater – PAH contaminated	300 – 1,000	*	*	**
Wastewater – Metals contaminated	300 – 1,000	*	*	**
Wastewater – Miscellaneous (i.e. low level Ammonia, COD, etc.)	500 – 2,000	*	*	**

*** Provided as part of NSE Part V Application for Approval Process; See Site Plan in Appendix.**

2.2 Possible Emergency Types

An emergency is defined as a combination of circumstances that requires immediate action.

The following is a list of emergencies that might be reasonably expected to occur on-site and off-site:

- Fire
- Explosion
- Petroleum or Chemical Spill (note: waste oils, and includes discharges, emissions, escapes, leaks or spills)
- Natural Gas Release
- Volatile Emission
- Workplace Injury
- Power Failure

3 Roles and Responsibilities

The Facility Manager or Designate is responsible for day-to-day operations of the facility including environmental and safety emergency response. In the event of an emergency the Facility Manager or their designate will assume the role of Response Commander. Facility Operators are responsible for oil releases to the marine environment with support from responsible government agencies as required.

3.1 Duties of Facility Manager or Designate

3.1.1 Advance Preparation

The following personnel will be instructed in the manner in which their assigned duties are to be carried out in the event of an emergency. Once an incident is discovered or reported, the Facility Manager or their Designate assumes the role of Response Commander.

- Site Security personnel will meet emergency vehicles (fire truck, ambulance, spill response unit, police) at facility entrance on Pleasant Street and direct them to the emergency site or command centre. This person shall not talk to the media.
- In a power failure situation operations personnel will monitor Heaters 1 and 2.
- The Facility Manager or Designate may request others to call emergency services (ambulance, fire, police).
- Personnel should go to their assigned posts and remain there (if safe to do so) until:
  - They carry out their function
  - They are called back
  - They have been relieved of their duty (breaks, lunch, etc.)
  - The "all clear" has been given
- The Facility Manager or Designate is responsible to provide management with a list of emergency personnel.

3.1.2 Field Coordination

- The Response Commander will evaluate:
  - The seriousness of the incident
  - If the emergency situation can be stopped or controlled quickly
  - What is required to stop or control the incident
  - If it is necessary to shut down the operation

- In the event that there are casualties or injuries, the Response Commander shall use the ECMA technique for evaluation:
  - Evaluate the Environment: electrical, chemical equipment hazards
  - Evaluate the Mechanism: What was the cause – weather, equipment, fall, etc.
  - Evaluate the Casualties: Number, extent of injuries.
  - Evaluate the Assistance required: Ambulance, fire department, police etc.

- The Response Commander will coordinate:
  - Response and/or evacuation
  - Any necessary search and rescue efforts
  - Advise necessary personnel to meet emergency vehicles at the gate and guide them to the scene

- Cordon off or secure the emergency area as required
- The taking of a personnel head count
- Ensure that there are trained personnel on standby to deal with first aid, spill response (outside help if necessary)
- Take whatever actions required to deal with the situation as determined by the initial evaluation
- Contact Management and Safety Coordinator as required

3.1.3 Field Decisions

The Response Commander will initiate the activation of the Evacuation Plan when:

- There is immediate possibility of danger to personnel
- There is possibility the incident may worsen (out of control) to the extent of danger of danger to the personnel
- Notify personnel through telephone and radio system of sending a person if it is safe to do so

4 Emergency Command Centre

The building control room will be used as the primary emergency command centre. If, due to circumstances at the facility, it is not safe to remain on site, the back up operations centre will be at Envirosoil's headquarters on Rocky Lake Drive in Bedford, NS. Both locations will have a copy of the Emergency and Contingency Plan.

5 Public Relations

All communication or information releases will be managed by the Envirosoil General Manager or their designate.

6 Implementation and Operation

6.1 Activation

6.1.1 Notification

The telephone is the main emergency communication system.

- Telephone (office and laboratory lines)
- Cell phone

- Portable radios
  - Radio Protocol
    - Speak clearly and slowly.
    - Give the emergency type.
    - Give the location.
    - Type of assistance required.
    - Repeat the message two times.

Maintain open communications with the scene and forward any pertinent information such as:

- The cause of the incident
- The type of material used
- Hazards which still exist
- Possible problems with protection of personnel
- Updates of any changes in the incident or area conditions

6.1.2 Emergency Contact List (to be updated prior to initiation of operations)

Internal

Facility Manager:
Assistant Facility Manager:
Facility Operators:

External

Fire, Ambulance, Police	911
Poison Control Centre	1-800-565-8164
Department of Labour	1-800-952-2687 / (1-800-9-Labour)
Nova Scotia Environment	1-800-565-1633
For critical injuries or environmental incidents	
See Section 5 communication list or contact Safety Department at	(902) 835-3381
Marine Petroleum Spill	
Canadian Coast Guard Spill #	1-800-565-1633
CANUTEC (24-hr number for dangerous goods)	1-613-966-6666
	1-613-930-9690/(902) 461-9170

7 Response Procedures

The following is a description of the procedures for managing the response to the most probable emergencies at the facility.

7.1 Evacuation

The entire facility shall be evacuated if the Response Commander has evaluated that there is an immediate possibility of danger to personnel or if there is a possibility the incident may worsen to the extent of danger to personnel. The Response Commander shall announce the evacuation through the communication system.

7.1.1 Evacuation Procedures

- Stop work immediately.
- Shut down any equipment being used. Use your specific shutdown instructions for the equipment.
- If working in the building leave your work area and go to the closest exit (if safe to do so).
    - Do not go through other areas of the building.
- Go to the assembly area (Muster Station).
- Follow a safe route to the assembly areas.
- Report to the Response Commander or Designate.
- Remain at the assembly area until the all clear is given, unless otherwise instructed by the Response Commander or Designate.
- Visitor and contractor safety is the responsibility of the Envirosoil personnel under whose charge they are working/visiting.

7.1.2 Assembly of Personnel

The Response Commander must ensure that all people onsite are accounted for. During an emergency situation, all persons are to proceed to a muster station location that is determined by the wind direction as indicated by the windsocks; either at the main building or main gate. The Response Commander is to:

- Ensure a total head count.
- Report any discrepancies in the head count so search efforts may be initiated (if safe to do so).
- Ensure visitors are accounted for – Visitors names can be verified by using the visitor register.
- Contact or phone on-site contractors to have a current list of personnel on site.

Note: Team leaders may assist with this duty by ensuring that all personnel are accounted for and moved to a designated assembly area. This will include any outside contractors and visitors to the facility.

7.1.3 Visiting Personnel

All visiting personnel will leave with the Envirosoil personnel that they were visiting with then there is an evacuation.

7.1.4 Assembly Areas

The facility's main gate is designated as the muster station.

7.1.5 All Clear Signal

The Response Commander or Designate will notify when the possibility of danger to personnel has been removed. Once the all clear is given, personnel may return to their work stations/sites and wait for further start-up instructions.

7.2 Fire

7.2.1 Initial Discovery

Upon discovery of a fire by any employee, the following steps shall be taken:
Announce the fire via:

- Call the office/laboratory.
- Use a portable radio if you have one.
- Send someone else or go yourself.

Use the extinguishing methods at your disposal if the fire is still in the incipient stage and you know how to fight it as a result of experience and training.

- If the Fire is beyond the incipient stage, announce the fire using the steps noted above.

Communicate calmly and clearly:

- The type of fire (size).
- The location of the fire.
- Who is reporting the fire and your location.
- Repeat the message twice.

REMAIN CALM – THE EFFECTIVENESS OF THE INITIAL RESPONSE CAN DEPEND ON CLARITY AND ACCURACY OF THE INFORMATION

7.2.2 Fire Alarm

There is no separate facility alarm. Use the procedure outlined in Section 7.2.1

7.2.3 Response

Upon receipt of the report of a fire, communicate this information to the Facility Manager or Designate (Response Commander).

If the fire is beyond the incipient stage:

- The Response Commander or Designate will notify the personnel at the site via radio.
- The Response Commander or Designate will make the decision if the fire department is to be contacted.
- The Response Commander or Designate will notify Envirosoil management.

7.2.4 Evacuation

Should evacuation of the site be necessary, refer to the evacuation procedures in Section 7.1

7.3 Explosion

7.3.1 Assessment of Situation

In the event of an explosion, the Response Commander will make decisions after the initial assessment. That is:

- Evacuate the area
- Evacuate the building
- Call for emergency help
- Ambulance
- Fire department
- Spill response
- Police
- Senior management
- Cordon off the area

7.3.2 Evacuation

Should evacuation of the site be necessary, refer to the evacuation procedures in Section 7.1

7.4 Petroleum or Chemical Spill

7.4.1 Spill Emergency

If a spill occurs, the Facility Manager or Designate (Response Commander) shall assist at the incident scene and take whatever steps deemed necessary to contain the spill. Consult the Safety Data Sheet (SDS) if necessary (Appendix D).

7.4.2 Evacuation

Should evacuation of the site be necessary, refer to the evacuation procedures in Section 7.1.

7.4.3 Evacuation Because of Outside Influence

If it is necessary to evacuate the facility because of an outside influence (chemical spill), then proceed to one of the assembly areas described in Section 7.3 if it is safe to do so.

7.4.4 Area Evacuation

The governing factors on area evacuation will be:

- The conditions of the assembly area and the local authorities (if applicable).

7.4.5 Specific Spills

Any leakage or spill must be reported to the Response Commander immediately.

Ensure that any non-authorized personnel are kept away from leaks or spills.

- When working around open or spilled liquid waste materials, diesel fuel (from trucks only) and hot oil heating fluid, the following personal protective equipment shall be worn:
  - Rubber gloves.
  - Chemical resistant goggles.

In cases of any substantial leaks or spills, the spill shall be contained by using the material in the spill kit and forming a dyke to absorb as much liquid as possible.

Carefully shovel all of the absorbent/contaminant into open top containers. Do not fill or cover the containers.

Pour liquid decontaminant/neutralizing solution liberally over the remaining spill area and spread evenly to ensure contact. Let stand for 10-15 minutes at 25 degrees Celsius or longer at lower temperatures. Then wash down with water.

7.5 Natural Gas

7.5.1 Natural gas Emergency

Contact Heritage Gas immediately at **1-866-313-3030** in the event of a leak in any of the lines feeding the facility from the distribution pipe on Pleasant Street.

7.5.2 Natural Gas Leak without Fire

- Use a landline phone to call – leave the area of the leak before calling Heritage Gas
- Do not start any vehicles
- Do not turn on any electrical or appliance switches
- Do not smoke or use lighters
- If the leak is inside a building, call Heritage Gas immediately and open windows and doors to ventilate the building.
    - If the smell (the additive, mercaptan smells like rotten eggs) worsens or you hear a hissing sound, leave the building immediately, leaving windows and doors open and call Heritage Gas from a safe distance.
- If the leak is outside a building, call Heritage Gas immediately and keep windows and doors closed to prevent gas from entering the building.

7.6 Volatile Emission

Sources for Volatile Organic Compounds (VOCs) and particulate matter will be primarily associated hot oil heaters in the building, as well as the asphalt storage tanks associated with pre-existing activities at the site. *Make sure to read and understand the SDS before working with the product. Use appropriate personal protective equipment (PPE) as instructed in the SDS (Appendix D).*

In case of emergency:

- Immediately remove the victim to fresh air. (When administering first aid, ensure that you and other responders are wearing appropriate PPE according to the incident.
- If rapid recovery does not occur, call 911 immediately for additional assessment and treatment.
- The Facility Manager or Designate (Response Commander) will inform senior management of the incident.
- Take all reasonable steps to minimize the discharge of air contaminant.
- Ensure there are no ignition sources in the affected area.

If the incident occurs indoors, keep the temperature and humidity as low as possible or comfortable. Chemicals off gas more readily in high temperatures and humidity.

7.6.1 Evacuation

Should evacuation of the site be necessary, refer to the evacuation procedures in Section 7.1

7.6.2 Evacuation Because of Offsite Influence

If it is necessary to evacuate the facility because of an offsite influence (volatile emission) then proceed to one of the assembly areas described in Section 7.3 if it is safe to do so. You should always position yourself upwind of the emission source (note position of windsock).

7.6.3 Area Evacuation

The governing factors on area evacuation will be:

- The conditions of the assembly area and the local authorities (if applicable).

7.7 Workplace Injury

7.7.1 Initial Discovery

- Send someone to immediately report the incident to the Facility Manager or Designate (Response Commander) or report it yourself as conditions dictate. Communicate calmly and clearly.
    - There is a workplace injury
    - The location of the incident
    - The nature of the injury
    - Identify who is reporting the incident and your location.
- The Response Commander will respond immediately and will take whatever actions deemed necessary:
    - Evaluate the seriousness of the incident.
    - Administer first aid if it is safe to do so.
    - Call 911 if necessary.
    - Shut down the operation where the incident occurred, secure the incident site and post a guard if it is safe to do so.
    - Evacuate personnel that may be at risk due to the incident.

7.7.2 In the Event of Critical Injury or Death

The Response Commander shall contact the Department of Labour using the telephone list in Section 15 or in the accident report package.

In the event of a fatality, it is a requirement to notify the police.
The response Commander will notify the Safety Coordinator and Senior Management immediately.

Under Section 63 of the ***Nova Scotia Health and Safety Act***, it is imperative to comply as follows re:

(1) The employer shall send written notice to the Director
    a. Of a fire or accident at the workplace that occasions bodily injury to an employee, within seven days of its occurrence
    b. Of an accidental explosion at the workplace, whether any person is injured or not, within twenty-four hours of its occurrence; and
    c. Where at the workplace a person is killed from any cause or is injured from any cause in a manner likely to prove fatal, within twenty-four hours of the occurrence of the death or injury.

(2) A true copy of the notice of accident is required to be given by an employer to the Worker's Compensation Board, pursuant to the Worker's Compensation Act, may be delivered or mailed to the Director as sufficient notice pursuant to this section.

(3) Where a notice is required to be sent to the Director pursuant to this Section, the employer shall furnish the committee or representative at the workplace, if any, with a copy of the notice. *1996, c. 7 s. 63*

7.7.3 Disturbance of an accident scene

Except and otherwise directed by and officer, no person shall disturb the scene of an accident that results in serious injury or death except as it is necessary to:

(a) attend to persons injured or killed;
(b) prevent further injuries; or
(c) Protect property that is endangered as a result of the accident. *1996 c. 7 s. 64*

Nothing at the scene of the accident may be removed, disturbed or destroyed until permission has been given by the Department of Labour Inspector, unless it is necessary to rescue a worker or to provide first aid.

7.7.4 Evacuation

Should evacuation of the site be necessary, refer to the evacuation procedures in Section 7.1.

7.8 Power Failure

In the event of a power failure, all personnel will:

- Shut down any machinery being used (control switches).
- Remain in the area of work.
- Do not go through the facility/building unless authorized, as you may be entering a hazardous area.
- Follow existing power failure procedures
- If you have a radio, change from channel 1 to channel 3

Operator:

- Verify all hot oil heaters are running.
- Check to see if thermal oil is circulating well through the system.
- Begin re-start procedures.

Power Outage Information

- Contact Nova Scotia Power to find out what has occurred (**24hr service – 1-877-428-6004**)
- When there is a power failure, all equipment stops with the exception of those units power by the back-up generator.

7.8.1 Emergency Lighting

Emergency lighting is used to provide adequate illumination for personnel to safely shut down equipment/machinery and await further instructions in the work area.

8 Fire and Emergency Equipment

8.1 Fire and Emergency Equipment Procedures

- Monthly, a qualified party shall inspect and ensure that all fire extinguishers are charged and at the designated locations.
- The on-site fire hydrant shall be inspected annually by a qualified party. Copies of the inspection reports should be kept onsite in the event they are requested by Halifax Regional Fire and Emergency inspectors.
- If fire hoses are installed, they shall be checked to ensure they are property rolled, in good condition and ready to use. Hoses must be pressure tested at least annually to ensure good condition.
- The inspection checklist for each location shall be checked, dated and initialed by the inspector. Each equipment location shall be identified to ensure all of the equipment is verified and a checklist shall be provided to the inspector for completion of these tasks.

- Emergency lights shall be tested semi-annually by a qualified person to ensure working condition.
- Any equipment found to be defective must be replaced or repaired immediately.
- Any worker who observes damage or breakage to fire and emergency equipment must report it to their supervisor.
- No welding, grinding or hot work shall be performed where there is no fire protection.
- **No smoking is permitted on site!**

8.2 Inventory of Emergency Equipment

The following is an inventory of potential response equipment. Once the facility is operational, an inventory of emergency equipment will be maintained with an inspection schedule.

Fire Response Equipment:

- Fire extinguishers
- Fire blankets

Containment Equipment:

- Large (200 L) Universal Spill Kits
- Small (40l L) Universal Spill Kits

Note: Spill kits include PPE as well as containment and clean up materials in keeping with the spill size they are designed for.

Decontamination Equipment:

- Eye wash Station/shower combination
- Personal Eye Wash Stations

First Aid Equipment

- Nova Scotia #2 First Aid Kit (or equivalent)

9 Rehabilitation

The intent of rehabilitation following an incident is to return the impacted area(s) to the pre-incident conditions.

Releases will be contained and cleaned up using the appropriate methods as dictated by the material spilled.

Impacted ground surfaces will be sampled by a qualified professional and submitted to an accredited laboratory to confirm effectiveness of the initial clean up.

Soil and other affected material (e.g. concrete, asphalt) will continue to be removed until contaminants are no longer detected.

Replace removed soil and other material to the original state prior to the incident.

If required, obtain approval from Nova Scotia Environment.

10 Disposal

Transport and Disposal of recovered material will be managed by Envirosoil and will be disposed of through provincially approved facilities. These facilities are located within the Halifax Regional Municipality. Out-of-province disposal is not anticipated based on the nature of the activities proposed at the site.

11 Reporting

If requested, Envirosoil will provide NSE with a report detailing the following information regarding spills/releases:

- Date and Time of Release;
- Weather/Atmospheric Conditions at the time of the release and throughout the response;
- The cause of the release;
- A description of the substance(s) released and the quantities released;
- The affected environment and/or properties;
- Identification of all parties and individuals involved in the response or exposed to the product included by-products of combustion;
- Health and safety concerns;
- Containment measures used;
- Mitigation (clean up) techniques employed;
- Site remediation (restoration) completed and planned;
- The current status of the response;
- A log of the actions taken; and
- Preventative measures implemented to prevent any re-occurrence.

An incident report form template is provided in Appendix B. (*Note: this Form would be inserted once the facility is operational)

12 Administrative

12.1 Training

Provide details of proposed training including:

- Envirosoil's commitment to training its personnel in company policy and procedures for responding to emergencies.
- Orientation for new or returning personnel.
- Required training for employees including standard training and specialized training.
- Frequency of the training described.
- Procedures for updating the training curriculum.

12.2 Exercises

Training exercises including response drills for the waste oil recycling and water treatment facility will be conducted in accordance with Envirosoil's ISO 14000 Environmental Management procedure.

12.3 Procedure Review

The Emergency Procedures will be reviewed annually or whenever a change is required to ensure they are kept current with applicable standards, industrial codes of practice, or legislation. Changes must be communicated to the Safety Coordinator. The Safety Department will initiate the review, set the review date and notify personnel of the date.

13 Emergency General Information

13.1 Posted Emergency Procedures

The emergency procedures will be distributed to all personnel. Supervisors will ensure each member of their respective team has a copy.

13.2 Start-Up Procedures

The Facility Manager or Designate will be responsible for delivering the "all clear" status when the emergency is over. Start-up procedures will be under the direction of the Shift Supervisor.

14 Other Contingencies

14.1 Vegetation and Wildlife

Should nesting birds or their young or species at risk be encountered on the site, personnel making the discovery will advise the Facility Manager or their Designate who will have the area cordoned off to prevent further disturbance. The Facility Manager or their Designate will then contact the Nova Scotia Department of Lands and Forestry Wildlife Division (902-679-6097) to discuss immediate actions and mitigation.

14.2 Archaeological and Indigenous Resources

If an archaeological or Indigenous resource/artifact or human remains is unearthed or discovered during the construction or operation and maintenance phases of the Project, the following procedure will be followed:

- Work will be stopped and the area will be marked to prevent further disturbance;
- Immediately contact the Special Places Program (Nova Scotia Department of Communities, Culture and Heritage; 902-424-6475), to notify of the discovery and establish a mitigation plan;
- No additional work will be permitted at the site until approval has been received from the Special Places Program;
- If human remains are found, work in the area must cease and the RCMP should be immediately notified.
- No one shall disturb, move or rebury any uncovered human remains.
- If it is a suspected First Nations burial site, the First Nations should be contacted.

Appendices

Appendix A: Site Plans (including muster station, wind sock, etc.)

Appendix B: Incident Report Forms (note: this Form would be inserted once the facility is operational)

Appendix C: Material Safety Data Sheets (to be included in version kept on site)