Environmental Assessment Registration Document

Aerotech Waste Handling Facility

203 Aerotech Drive, Goffs, NS

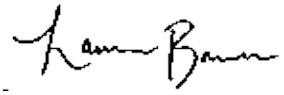
GFL Environmental Services Inc.
Final Report

October 29, 2024
2312359.001

ENGLOBE

GFL Environmental Services Inc.

Prepared by:



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Revisions and publications log

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Minimum Requirements Checklist

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NSECC, 2022. *Environmental Assessment Regulations*.

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1 Introduction

1.1 Overview

GFL Environmental Services Inc. (the proponent) is proposing the expansion and operation of a waste handling facility for the temporary storage of Waste Dangerous Goods and Waste Non-Dangerous Goods at its 203 Aerotech Drive site in Goffs, Nova Scotia. To proceed with this project, a Class 1 Environmental Assessment (EA) is required, pursuant to the *Environment Act* as identified in Schedule A of the *Environmental Assessment Regulations*, Undertaking E.1 Waste Management (1) "*A facility for storing, processing, treating or disposing of waste dangerous goods that were not produced at that facility, except all of the following facilities: a) a facility operated by, or on behalf of, a municipality or Provincial agency for waste dangerous goods collected only from residential premises; b) a facility in which asbestos waste is stored, if waste dangerous goods are not otherwise processed, treated or disposed of at that facility; c) a facility in which lead acid battery waste is stored, if waste dangerous goods are not otherwise processed, treated or disposed of at that facility*.".

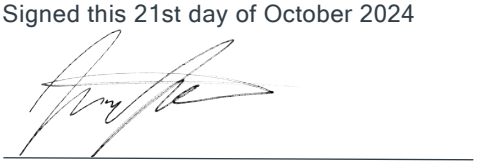
The 203 Aerotech Drive facility currently holds two active permits: one for water treatment and discharge (NSECC 2023-3370913-03) and one for used oil collection and storage (NSECC 2015-093397-03). The facility currently treats wastewater and is a transfer location for handling and ultimate disposal of small quantities of waste non-dangerous and dangerous goods. Wastewater is received from outside sources and treated onsite, with all treated wastewater effluent being discharged to the Halifax Water (HW) sanitary sewer. Waste goods (such as oily rags, oil filters, paint drums, etc.) are received in containers and are processed to capture reusable or recyclable products (such as waste oil) before consolidation into containers for off-site disposal. All liquid and solid waste resulting from the wastewater treatment process and waste good handling are hauled to a number of different approved facilities for final disposal.

This project will allow GFL Environmental Services Inc. (GFL) to accept and handle/store Waste Dangerous Goods (WDG) and Waste Non-Dangerous Goods (WNDG) at their Goffs facility, at larger quantities than those exempted in the *Nova Scotia Dangerous Goods Management Regulations (NSDGMR)*.

1.2 Proponent Information

The proponent is GFL Environmental Services Inc. The Nova Scotia (NS) Registry of Joint Stocks information is provided in Appendix A. Contact information is provided below:

Proponent:	GFL Environmental Services Inc.
Proponent CEO:	Patrick Dovigi
Proponent Contact:	Matthew Zwicker
Official Title:	Regional Director, Strategic Projects
Mailing Address:	11 Brown Avenue, Dartmouth, NS B3B 1Z7
Phone:	(902) 468-9011
Email:	mzwicker@gflenv.com
EA Consultant:	Aven Cole, M.Sc.E., P.Eng.
Company:	Englobe Corp.
Mailing Address:	97 Troop Avenue, Dartmouth, NS B3B 2A7

Phone:	(902) 468-6486 ext. 167234
Fax:	(902) 468-4919
Email:	aven.cole@englobecorp.com
	Signed this 21st day of October 2024  Jordan Poste Regional Vice President GFL Environmental Services Inc.

2 Undertaking

2.1 Name of Undertaking

GFL proposes the expansion and operation of a waste storage facility for the temporary storage of WDG and WNDG at its 203 Aerotech Drive site in Goffs. This project is referred to as the Aerotech Waste Handling Facility.

2.2 Location and Adjacent Land Use

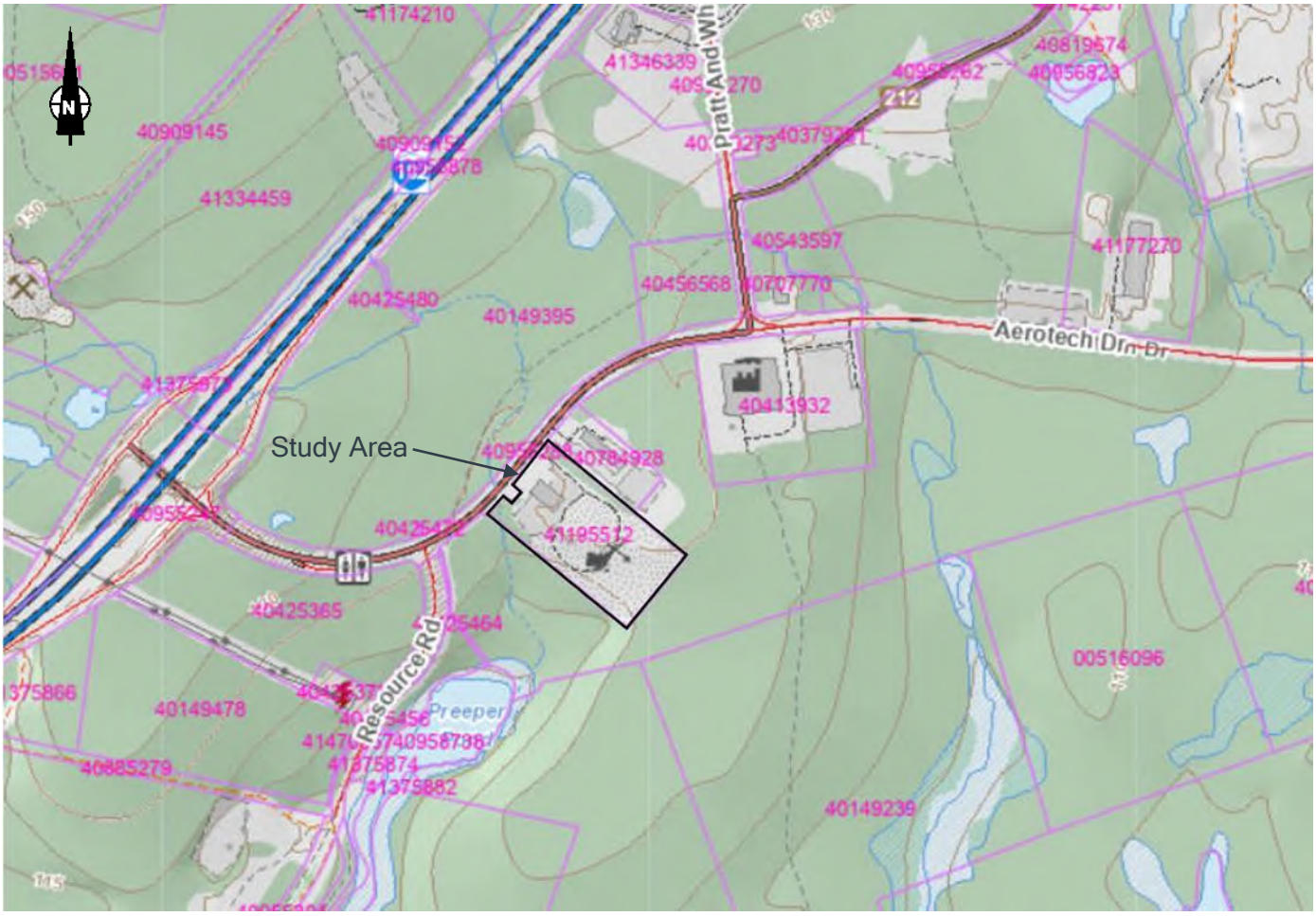
The Project Site is located on private land, along the south side of Aerotech Drive in Goffs, Halifax County, NS, as shown on Figure 2-1. The Study Area (PID No. 41195512) is comprised of one parcel, owned by CleanEarth Industrial Services Inc. (CEIS) and operated by GFL. The parcel is approximately 5 hectares (ha) in size.

Currently, the property is used in an industrial nature, and those operational areas are fenced. There is a building onsite that is approximately 1,670m^2 that is used as a warehouse and office space. There is also a covered pad (approx. 300m^2) and a tank farm (approx. 350m^2). The remainder of the site is used for general equipment storage and truck parking. The project area, specifically, is the building, and areas adjacent to the building and tank farm. A site plan with the project concept is provided in Appendix C.

Based on the local topographic contours (from Google Earth digital terrain mapping and NS Digital Topographic Map 1:10,000 series), the site is relatively flat and the surrounding area slopes downward from northeast to southwest (towards Preeper Pond).

The Study Area is located in a predominately un-inhabited area with neighbouring land uses to the northeast being predominately commercial. Based on review of the Study Area on the Service Nova Scotia and Municipal Relations (SNSMR) website, the site and most of the developed surrounding properties are classified as commercial taxable/exempt, and the undeveloped surrounding properties are classified as resource taxable. The nearest residential dwelling is located approximately 3km from the Project Site (at Civic No. 931 Perrin Drive). The Project Site is separated from the residential areas by other commercial lands, water features, and forest; the site is not visible from any residential property, but is visible from Aerotech Drive.

Figure 2-1 Site Location



3 Scope

3.1 Nature of the Undertaking

GFL is a leading provider of industrial and environmental services including hydro blasting services, vacuum truck services, industrial cleaning and industrial waste management. GFL has an extensive list of equipment to service local industry including vacuum trucks, tractors, trailers, service vehicles, high pressure wash units (up to 40,000 psi), boilers, loaders, deck trucks, pumps, forklifts, tankers, as well as all necessary tools, fittings, meters, rescue equipment, lighting and air movers (fans). The permanent operators, technicians and managers work in a project team structure designed to facilitate a customized approach to clients' needs. The Aerotech Drive Facility contains three main operational service groups – Industrial & Field Services, Chemical Cleaning and Industrial Waste Services.

GFL intends to continue to use the Project Site for the purpose of wastewater treatment (with discharge of treated effluent to the HW sanitary sewer) and oil collection/storage, with the addition of waste (WDG and WNDG) handling/storage operations in quantities that exceed the *NSDGMR*. The *NSDGMR* identifies 9 classes of dangerous goods. GFL proposes to accept the WDG and WNDG identified in Table 3-1. Note, some of these WNDG are already permitted under GFL's current operating Approvals (wastewater and used oil).

Table 3-1 Potential Material Types of WDG and WNDG for proposed handling and temporary storage at the site

Waste Dangerous Goods (*NSDGMR*)	Waste Non-Dangerous Goods
Class 2 (gases)	Wastewater (impacted with PHCs, PAHs, suspended solids and/or metals, and associated with construction site dewatering, hydro excavation and other industrial applications)
Class 3 (flammable liquids)	Bilge water
Class 4 (flammable and water-reactive substances)	Oily water (associated from cleaning commercial oil water separators, grease traps, and water collected from petroleum tank cleaning)
Class 5 (oxidizing substances and organic peroxides)	Used oil and contaminated used oil (as defined in the *Used Oil Regulations*)
Class 6.1 (toxic materials)	Oily solids and sludges
Class 8 (corrosive substances)	Non-dangerous goods solids (rags, pads, hydro-excavation solids)
Class 9 (miscellaneous products, substances or organisms excluding PCBs and asbestos)	
Glycol (with concentration > 1000mg/L)	
Petroleum products with a flashpoint greater than 61 °C	

A building expansion may be required to accommodate the expanded scope of waste handling/storage operations at the facility. The onsite building is currently used for the water treatment process. There is currently no storage, processing or bulking of dangerous goods in the building. The slope/grade of the floor is generally flat with three sump pits that provide storage capacity for spilled liquids. There is additional secondary containment around the operations area.

The proposed expansion and modification of the building would be to accommodate a laydown area, and offloading docks for containerized waste. Some of the water treatment equipment may be removed from the building (for re-use at another facility) to provide space so that the building can be used for WDG and WNDG handling. A proposed building concept is presented in Figure 1, Appendix C. It will include space for drum staging and storage, a lab packing/bulking and pump out room, drum washing and crushing, and some minor storage for treated wastewater (that is suitable for discharge to HW's sanitary sewer).

The building would have capacity for 1,500 drum equivalents (307,500 L) and two poly tanks (35,000 L each) of waste. The anticipated waste volume inside the building would be 377,500 L and could be gases, liquids or solids. The expansion area would be integrated into the existing building structure, and the floors would be at the same elevation. Additional secondary containment would be installed, as necessary, to effectively contain waste in the event of a release. All containment will meet or exceed the requirements specified by current approvals and NSECC and is generally described in Figure 1, Appendix C.

Outside of the building, loading docks would be installed to facilitate waste handling. Loading docks would have integrated secondary containment; in an event of a release, the substance in the loading docks would be sequestered, sampled, and (depending on the product) transferred to a similar waste container or treated (wastewater) for discharge to the Halifax Water sanitary sewer. Other exterior operating areas at the site (bulk storage tanks, existing unloading areas) already have secondary containment in place, some upgrades will be carried out to further prevent and divert clean rainwater from accumulating in these secondary containment devices. The exterior travel areas around the building will be graded towards new stormwater collection devices. Waste releases are not expected; however, an emergency shut-off valve will be installed on the stormwater infrastructure to mitigate against potential releases.

A new exterior tank farm with 8-90,000 L tanks would also be constructed to store liquid waste and petroleum products other than used oil. All petroleum storage tanks will be registered according to *NS Petroleum Management Regulations.*

All interior and exterior waste handling would be conducted within secondary containment (i.e., sumps, berms, etc.). The proposed operation would store waste for two to four weeks on average, and no longer than 90 days. GFL estimates that 50,000 drum equivalents (205 L each) will be cycled through the facility on an annual basis. Usually, the wastes will be collected at the source by GFL and delivered to the Facility. Waste would be received through the loading docks and then securely placed within the facility in designated areas. Drums would be opened, sampled (where required), and consolidated (based on compatibility) to reduce overall shipping capacities when transported from the facility for final disposal. Sorting and consolidation of waste batteries, if it occurs, will happen within the building.

Repacking of wastes that do not require specialized handling could occur in designated staging and repacking areas in the building, and there would be a dedicated room for repacking of compatible wastes that may require additional specialized handling. Within this dedicated room, there would be a dedicated "pump out" chamber that would allow for consolidation of compatible dangerous and non-dangerous liquid wastes to be pumped directly to certified tanks that are stored in the tank farms outside of the building located in containment areas.

GFL estimates that 2,000,000 L of bulk flammable liquids will be cycled through the tank farm on an annual basis. Delivery of bulk flammable liquids (i.e. vacuum trucks or tankers) will be directly to the certified tanks within the existing and proposed tank farm. Delivery of containerized flammable liquids (i.e. drums or totes) would be received in the main receiving and staging areas. Materials that could be consolidated would then be transferred to the lab packing room to be consolidated and pumped to certified tanks in the tank farm via dedicated transfer lines. Smaller quantities of containerized flammable liquids may be consolidated with other compatible flammable liquids into drums in designated areas.

Bulking of wastes will result in more efficient loads for final disposal, therefore reducing environmental impact of transportation. Once consolidated, the wastes would be transported to their final approved disposal (or recycling) destination by GFL or an approved third-party contractor.

The project schedule is flexible, based on the timing of the various environmental Approvals. It is expected that site preparation can commence in spring of 2025, with waste storage/handling activities beginning in summer/fall 2025. The hours of operation for the site are 7 am to 6 pm, weekdays, except statutory holidays.

A generalized schedule of activities is presented below.

3.2 Purpose and Need of the Undertaking

In the Halifax region of Nova Scotia, there is a need for temporary storage of WDG and WNDG so that these materials can be consolidated prior to ultimate disposal outside of Nova Scotia.

The primary purpose of the proposed undertaking is to provide local capacity to temporarily and safely handle WDG and WNDG in a manner that they can be consolidated into smaller packaging and full

truckloads and shipped to a final (licensed) disposal facility in a more environmentally sustainable manner.

GFL has other facilities that carry out these permitted activities, however, the facility at 203 Aerotech Drive is on a central transportation hub and would result in increased transportation efficiencies. The additional handling space at this facility also ensures sufficient floor space is available to segregate and handle the wastes, allowing for larger loads to be consolidated prior to shipping. The increased handling quantities of WDG and WNDG at the GFL facility at 203 Aerotech Drive in Goffs would allow GFL to ensure storage is available for unplanned or short notice local waste pickups and to maintain service level standards with their customer base. The additional space at this facility would result in increased transportation efficiencies and less overall waste storage prior to out-of-province transport.

The expansion of the building and outside storage areas will allow for optimized engineered controls, waste segregation, and spill prevention and containment.

GFL is the only major diversified environmental services company in North America offering services in solid waste and liquid waste management. They provide safe, accessible and cost-effective solutions in order to encourage environmental responsibility.

3.3 Project Alternatives

Alternatives are defined as different ways of attaining the same outcome.

As a result of the regulatory and operational restrictions on the storage and handling of WDG and WNDG, and need for a suitable facility, infrastructure and location; the alternatives are limited for this Project.

With respect to both methods (of waste handling) and locations, GFL reviewed potential alternatives. Considerations during alternative review included the need for a suitable location that aligns with regulatory permitting requirements, and proximity to relevant markets (i.e., close to the WDG/WNDG origin). Development of the Project on an existing site with existing infrastructure (including municipal services) and emergency management measures was considered an asset compared to development of a green field site or a site in an un-serviced location.

The prospects of finding a suitable property (with existing infrastructure or for a new build) based on the considerations above, that is at a similar financial price point as the proposed project, are limited.

Other handling methods were explored including additional capacity at other local GFL locations (i.e., Brown Avenue facility), however, none were on a suitable transportation hub, and existing facilities had insufficient volume capacity based on their footprint and lack of expansion potential.

The alternative to the undertaking is the “do nothing” alternative, which does not achieve the same outcome. If nothing is done, there is potential there is insufficient local capacity to temporarily and safely store WDG and WNDG, therefore leading to increased shipping of smaller volumes which is ultimately not an environmentally sustainable practice.

3.4 Other Undertakings in the Area

Review of the *NSECC Environmental Assessment Project Registry* in August 2024 has revealed no provincial projects (that require environmental assessment) registered near the Project Footprint.

Review of the *Canadian Impact Assessment Registry* in August 2024 has revealed three different federal projects (that require environmental assessment) within 15km of the Project Footprint; they are all located at the Halifax Stanfield International Airport (approximately 2km away from the Project Footprint) for the Halifax International Airport Authority and include “Halifax Stanfield Airfield Improvements”, “Construction of Private Aircraft Hangar”, and “Construction of a New Cell Phone Lot”.

Based on review of available NSECC Industrial Approvals (in Goffs) in August 2024, within 5km of the site, the following industrial activities were identified:

- 171 Resource Road: Construction – Asphalt Paving Plant (NSECC 2020-2702296-00), Construction – Ready Mix Concrete Plant (NSECC 2017-102798-00), and Construction – Quarry (NSECC 2016-095664-04), all operated by Scotian Materials Limited
- 330 Aerotech Drive: Oil and Gas – Compressor and Pumping Station, operated by Eastward Energy Incorporated (NSECC 2013-085487-02)
- 1250 Old Guysborough Road: Services – Wastewater Treatment Facility, operated by Halifax International Airport Authority (NSECC 2000-011912-03)
- 189 Pratt and Whitney Drive: Metals – Electroplating Plant and Dangerous Goods – Dangerous Goods Handling Facility, operated by Pratt & Whitney Canada Corp./ Pratt & Whitney Canada CIE. (NSECC 2001-325267-00)

Significant cumulative project related effects in conjunction with other undertakings in the area are not likely to occur, given the nature of the current project, implementation of mitigative measures that are outlined here-in and the nature of the nearby industrial activities.

3.5 Land Ownership and Project Funding

The 5 ha project area is owned by CEIS and operated by the proponent (GFL). The project will be privately funded by GFL and will not include any outside funding from municipal, provincial or federal agencies.

3.6 Scope of the Environmental Assessment

This EA document has been prepared in conjunction with GFL, as well as review of the following:

- NSECC *Environmental Assessment Regulations*
- 2012 *Nova Scotia Environment Proponents' Guide : The Role of Proponents in Crown Consultation with the Mi'kmaq of Nova Scotia*
- 2018 *Nova Scotia Environment A Proponent's Guide to Environmental Assessment*
- 2011 *Nova Scotia Environment Guide to Considering Climate Change in Environmental Assessments in Nova Scotia*
- 2005 *Nova Scotia Environment Guide to Addressing Wildlife Species and Habitat in an EA Registration Document*
- 2021 *Nova Scotia Environment and Climate Change Contingency Planning Guidelines*
- 2023 *Nova Scotia Environment and Climate Change Guidelines for Environmental Noise Measurement and Assessment*

The Environmental Assessment is a planning tool used in which the environmental effects of a proposed undertaking are predicted and evaluated and are given consideration prior to the undertaking. The environmental assessment includes identifying and describing those components of the proposed setting within the area of the study boundaries that will or could be affected by the project. The process for an environmental assessment is a step-wise and transparent process. The steps in the process include:

- Determining the Valued Environmental Components (VECs)
- Determining the project activities that may interact with the VECs
- Determining the temporal and spatial assessment boundaries
- Determining the potential effects that could occur as a result of project activity interaction with the identified VECs

— Determining the mitigation measures or best management practices that can be used or implemented to reduce the impacts
— Determining and characterizing the residual environmental effects and their significance
— Developing monitoring measures

The scope of the assessment has been determined based on the proposed Project components and activities, the existing environment, stakeholder/regulatory consultations and regulatory framework, and on the associated identification of, and evaluation of the potential for the Project to interact with the VECs following mitigation. Additional detail on each of these factors is provided in Section 7.2. Potential environmental effects were evaluated for each of the Project phases for VECs that include:

— Surface Water Interactions
— Groundwater Interactions
— Aquatic Habitat
— Species at Risk
— Air Quality and Noise
— Climate Change
— Existing conditions for other components since they are either not present or will not change (i.e. flora, fauna, geology, transportation, land use, archaeology)

In addition to the VECs listed above, a significant portion of the assessment deals with accidents/malfunctions, contingency planning and safety.

The project includes both spatial and temporal boundaries in assessing the effects on the surrounding environments. The spatial boundaries include the area that the project has the potential to impact. The spatial boundaries are the area where potential project impacts occur, whether direct or indirect, and are dependent on the VEC and the potential effect of the project on a particular VEC. Temporal boundaries include the time period, or duration, over which the effect may occur and consist of site development and site operations until decommissioning.

The spatial boundaries of the assessment examine both a regional and local Study Area based on potential nature of the VECs.

— The regional Study Area reflects the regional atmospheric area, transportation to the facility, and the communities connected to the proposed Project.
— The local Study Area focuses on the Study Area and Project Footprint associated buffers in relation to VECs on-site, as well as within the local watershed (for hydrogeologic considerations and sensitive downgradient receptors).

The temporal boundaries include a proposed 2025 Project initiation with an approximate 20 to 30 year operations lifespan, followed by decommissioning of any activity specific equipment and repurposing of the building.

4 Engagement and Public Consultation

GFL is committed to engaging with First Nation communities and organizations throughout the life of the Project and sharing findings of all cultural or other valued environmental components. GFL has proactively interacted with the affected rights holders and stakeholders to share project plans and

related information. During the assessment process, GFL has actively engaged rights holders and stakeholders to share information and to understand what other concerns may be important to these groups. The goal was to proactively identify concerns regarding adverse effects or environmental effects; and, to identify means that Project concerns may be addressed, as applicable.

Public consultation for Class I Undertakings is not a mandatory component, except for announcing the release of the EA report to the public and noting that the public may submit written comments to the provincial Administrator within 30 days following the date of publication of the notice. Notice shall be published in one newspaper having general circulation in the community of the Project and in one newspaper with province wide circulation. Notices can also be published in municipal buildings, post office or public buildings, in absence of a local newspaper.

GFL will post notice in the Halifax Herald and The Laker Newspaper, in accordance with the required timelines. Confirmation will be provided to NSECC.

Therefore, in addition to the notice provided in the Halifax Herald and The Laker Newspaper, the following activities were conducted with respect to involving the public:

- Letter of Introduction and Project Description to Millbrook First Nation (MFN)
- Letter of Introduction and Project Description to Sipekne'katik First Nation (SFN)
- Letter of Introduction and Project Description to the Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO).
- Letter of Introduction and Project Description to the Maritime Aboriginal Peoples Council (MAPC)
- Letter of Introduction and Project Description to The Confederacy of Mainland Mi'kmaq (CMM)
- Discussion with local government agencies including:
  - NS Natural Resources and Renewables (NSNRR), NSECC and Nova Scotia Office L'nu Affairs (OLA).

Further details are provided in the following sections.

4.1 Mi'kmaq of Nova Scotia Engagement

On July 30, 2024, Gillian DesRoche, Senior Consultation Advisor at Nova Scotia OLA, was contacted via email for advice on the consultation process with the Mi'kmaq community. A response was received on August 2, 2024, with recommendations for engagement.

On August 7, 2024, letters of introduction and brief description of the project were sent to Chief Robert Gloade (MFN), Chief Michelle Glasgow (SFN), the MAPC, and the CMM via email. The Lands Department of KMKNO and Gillian DesRoche were copied on the letters.

Table 4-1 Summary of Mi'kmaq contact

Office	Contact Name	Response
Mlilbrook First Nation (MFN)	Chief Robert Gloade	None
Sipekne'katik First Nation (SFN)	Chief Michelle Glasgow	Yes
Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO)	Lands Department	None
Maritime Aboriginal Peoples Council (MAPC)		None
The Confederacy of Mainland Mi'kmaq (CMM)		None

No response has been received from the Millbrook First Nation, MAPC, CMM, nor KMKNO.

On September 20, 2024, the Sipekne'katik Consultation Department responded that the SFN has a community-based consultation protocol, the Sipekne'katik Governance Initiative (SGI), that is administered by the Sipekne'katik Consultation Department. The SGI process is composed of 6 phases and affirms the inherent authority of the SFN to manage their lands, waters, and resources by

regulating the industrial activities of foreign governments and proponents on their traditional territories. GFL has entered the SGI process with the SFN, although the process is in the early stages and no meaningful engagement has yet occurred other than GFL providing additional information related to the Project. Initial information from SFN indicates that any disruption of Sipekne'katik including that of the Sipekne'katik River System will impact the health and well being of the Sipekne'katikowaq.

In an effort to continue to engage with the Mi'kmaq of Nova Scotia, a copy of the EA document will be directly provided to the MFN, SFN, KMKNO, MAPC and CMM once it is registered.

A copy of all correspondence is provided in Appendix G.

4.2 Government Agency Engagement

During preparation of the EA document, Englobe contacted representatives from the EA branch to inform the EA branch of the project and request a meeting to formally introduce the project to NSECC and other provincial government stakeholders. Follow-up meetings were held with both the NSECC EA officer and NSECC EA branch manager.

Englobe contacted local representatives from NSECC compliance branch (Bedford Office) and NSNRR (species at risk biologist) to discuss the project, its related permitting requirements, and any suspected species at risk (VEC) in the project area.

A summary of contact for the project is presented in Table 4-2.

Table 4-2 Summary of government contact

Office	Name	Role
NSECC, EA Branch	Bridget Tutty	Manager, EA Branch
NSECC, EA Branch	Mark McInnes	EA Officer
NSECC, EA Branch	Helen McPhail	EA Officer
NSECC, Compliance Branch	Kevin Garroway	District Manager
NSECC, Compliance Branch	Jean-Charles Finnigan	District Engineer
NSECC, Compliance Branch	Derrick Peverill	Environment Officer
NSNRR, Wildlife Division	Sarah Spencer	Species at Risk Biologist
OLA	Gillian DesRoche	Senior Consultation Advisor

4.3 Key Issues

At this time, no key issues have been identified with the Mi'kmaq of Nova Scotia. GFL will continue to engage with the Sipekne'katik Consultation Department through the SGI process to determine if there are key issues.

At this time, no key issues have been identified with any other stakeholders. All concerns discussed have been related to the registration of the EA document and follow up Industrial Approval.

5 Description of the Undertaking

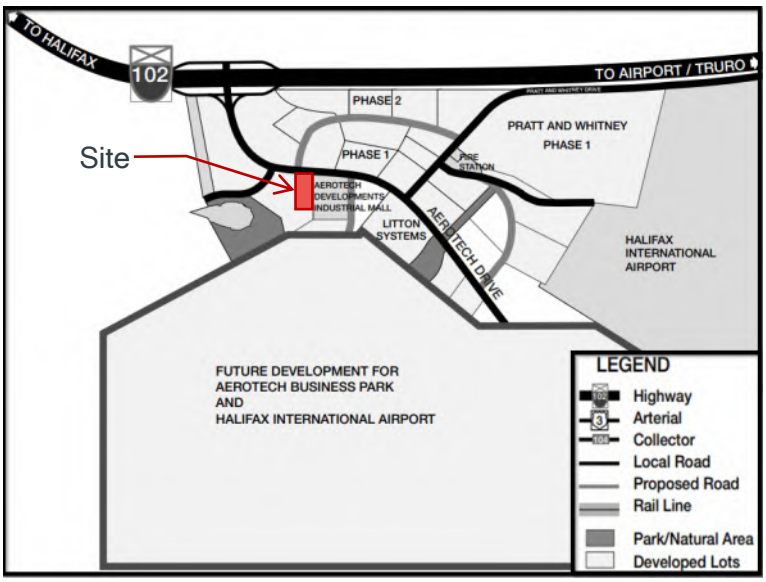
5.1 Geographic Location

The Project Footprint is located on PID No. 41195512 on the south side of Aerotech Drive, between Highway 102 and Pratt and Whitney Drive in Goffs, Halifax County, NS, as shown on Figure 2-1. The community of Goffs is located between the larger communities of Miller Lake West and Enfield. The coordinates of the site are approximately 4966788 m N, 456827 m E (NAD83 UTM20).

The Project Footprint will occur on CEIS lands. A site concept plan is provided in Appendix C, and a larger regional scale map (in support of the VEC assessment) is provided in Appendix D. The Project Footprint is fully within the property boundaries of Civic No. 203 Aerotech Drive, and is accessed by a restricted access (i.e., gated) driveway connecting the site to Aerotech Drive.

As noted in Section 2.2, the site is located in a predominately un-inhabited area with neighbouring land uses for purposes other than residential development. Current and future land use is intended for commercial and/or industrial activities as planned by the Halifax Regional Municipality (HRM) and enacted by Land Use Bylaws; these are described further below. Through HW, the Study Area is supplied municipal water, wastewater. The Study Area is supplies stormwater services through Nova Scotia Department of Public Works (NSDPW). Areas outside the municipal service area rely on private potable water wells and septic fields.

Figure 5-1 Aerotech Business Park



5.2 Climate Setting

The proposed Project site is located in the Eastern ecoregion (400) and Eastern Interior ecodistrict (440). Although the Eastern ecoregion includes some climatic conditions usually associated with higher elevations and proximity to coastal influences, it has primarily an inland, lowland climate sheltered from direct marine influences. Winters in this region tend to be colder (mean -5.0° C) than in western Nova Scotia (mean -3.5° C) and mean annual precipitation ranges from 1400–1500 mm (Neily et al, 2017).

Records from the Halifax Stanfield (Airport), 4 km to the northeast of the Study Area for climate normals (1991-2020) are summarized in Table 5-1. This weather station is in the same ecoregion and ecodistrict as the Study Area.

Table 5-1 Canadian Climate Normals 1991-2020 Station Data, Halifax Stanfield (Airport) Composite Station and Projections (Goffs)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Temperature Normals													
Daily Average, °C	-5.7	-5.2	-0.9	4.5	10.1	15.2	19.2	19.2	15.2	9.2	3.8	-1.9	6.9
Daily Maximum, °C	-1.2	-0.6	3.5	9.2	15.5	20.5	24.2	24.2	20.0	13.7	7.6	2.1	11.6
Daily Minimum, °C	-10.1	-9.7	-5.4	-0.3	4.6	9.8	14.2	14.1	10.2	4.7	0.0	-5.8	2.2
Precipitation Normals													
Rainfall, Mm	78.6	70.7	89.0	90.4	108.2	89.8	86.7	90.5	107.3	139.2	145.4	106.8	1,202.4
Snow fall, Cm	53.9	44.3	34.4	16.6	2.1	0.0	0.0	0.0	0.0	0.6	19.4	44.1	215.2
Total, Mm	125.9	111.0	120.2	106.4	109.7	89.8	86.7	90.5	107.3	139.8	159.1	146.9	1,393.3
Projections, 2031-2060 (RCP 8.5)													
Average Temperature, °C													8.4 to 9.9
Average Precipation, mm													1424 to1522
Max 24-hr Rainfall, mm													65 to 79

5.3 Operational History

The Site has been operated by CEIS (and since 2023 by GFL) as a collection, storage and treatment facility for various wastes (soil, wastewater, WDG and WNDG) since it was commissioned in 2005. The onsite building is used as a warehouse and office space, while the remainder of the property is used for storage and truck parking.

The facility is fully permitted and operational as a Used Oil Collection Facility, under Approval No. 2015-093397-03, effective November 1, 2023, expiring July 28, 2025, and as a Wastewater Treatment Facility, under Approval No. 2023-3370913-03, Effective October 11, 2024, expiring July 13, 2033.

Used/contaminated oil collection/storage has always occurred and continues to occur at the site, with the used oil eventually being sold for re-use and associated wastes being shipped to an approved facility for disposal or recycling.

Wastewater collection and treatment (within secondary containment) also continues to occur at the site, with treated effluent being discharged to the HW sanitary sewer and associated wastes from the treatment process being consolidated and shipped to an approved disposal facility. If wastewater can not be treated to meet the HW discharge criteria, it is shipped to an approved disposal facility.

Waste goods (WDG and WNDG) generated as part of the other operations, as well as other small quantities of these products are handled at the facility. These waste goods are consolidated to reduce overall quantities and transported off-site to a final (licenced) disposal facility.

Contaminated soil and sulphide bearing material (SBM) treatment was conducted at the facility until 2021, when CEIS discontinued this treatment service. Associated exterior treatment areas were decommissioned and the soil treatment equipment was removed from the site.

5.4 Physical Components

A building expansion and additional exterior tank farm may be required to accommodate the proposed additional waste handling operations at the facility. The current Study Area, site boundaries and proposed Project Footprint are provided in Figure 1 (Appendix C). The undertaking will include the following activities, which are described further below:

— Site Preparation
— Operations (and Maintenance)
— Decommissioning and Reclamation

The onsite building is currently used for the water treatment process. Maintaining the current operations, there is floor space in the building and the exterior storage areas for the proposed increase in volumes of WDG and WNDG to be handled. The proposed expansion and modification of the building would be to accommodate a laydown area, lab-pack room and efficient offloading docks for containerized waste that incorporate secondary containment.

There are currently no undisturbed or natural habitats being disturbed at the Project Footprint as the fenced portions of the site have been previously used for industrial purposes. Very minimal natural areas are still present at the site, therefore no further disturbance of natural habitats will occur.

Based on the Land Use Bylaw (Halifax Regional Municipality, 2024a), the Project Footprint and Study Area is currently zoned “AE-1” Aerotech Core. Only industrial and business land use is permitted in this zone. Surroundings lands are zoned “AE-4” Aerotech Business, “AE-2” General Airport (industrial and commercial land use), and “AE-H” Holding, all of which are industrial and commercial land uses.

A review of the area surrounding the Project Footprint reveals the following land uses; the Project Footprint is not visible from any of these residential dwellings or commercial buildings although the site is visible from Aerotech Drive:

Table 5-2 Summary of surrounding properties

Distance (km)	Number of Potential Residential Dwellings	Number of Potential Commercial Buildings	Number of Agricultural Uses
0.5	0	2	0
1	0	7	0
1.5	0	9	0
2	0	14	0

Other relevant features in the surrounding area are depicted on Figure 1 provided in Appendix D.

5.5 Site Preparation

Due to the industrial nature of the site and the proposed location at an existing facility; minimal site preparation is required. Existing equipment present in the Project Footprint will be moved, to allow for excavation and construction of the building and tank farm expansion. The expansions will be designed in accordance with industry standards and comply with all required building codes. All secondary containment will be incorporated into expanded areas; the exact method will depend on the area. Examples and locations of the expected types of secondary containment are depicted on Figure 1, Appendix C and include integrated sub slab concrete sumps, concrete berm walls (around exterior concrete slabs) and drive over spill containment berms (i.e. “speed bumps”). The secondary containment devices will be designed to contain 110% of the volume of the largest tank or container in the specifically contained area, or 100% of the volume of the largest tank or container plus 10% of the aggregate capacity of all other containers or tanks in the contained area, whichever is greater. All

concrete devices will be designed and installed to prevent construction joints that may leak. The secondary containment devices will be self contained and under no circumstances drain directly to the HW sanitary sewer.

Upgrades to the exterior site grading will be carried out as part of the work, ensuring that the operations yard is graded towards new exterior stormwater catch basins, where possible. During upgrades to the stormwater infrastructure, an emergency shut off valve and dedicated pump out control device will be installed in on the stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.

Heavy-duty motor gasoline and/or diesel fuel oil construction equipment (trucks, excavators, etc.) and light-vehicles would be required during construction of the expansion areas. Greenhouse gas emissions (GHG) (CO_2, CH_4, and N_2O) from off-road fuel combustion of construction-related activities and on-road transportation, and fugitive dust may be generated by these mobile sources. Emission levels will be managed through pollution control practices including reduced-idle practice, regular inspection and maintenance of heavy-duty equipment and clean burning fuel. If needed, dust will be controlled through the application of water (brought by water truck from off-site).

Silt fences and other erosion and sediment control measures (as required) will be installed to contain any site sediment and eliminate off-site sediment transport. During earthworks, filter fabric will be placed over catch basin covers to prevent release of sediment into the stormwater service. The proposed exterior catch basins will also be designed to allow any sediment that may be captured during rain events to be contained at the base of the catch basin and not flow out the discharge pipe. This accumulated sediment will be cleaned out on a regular basis.

Petroleum products and other chemicals are already stored at the site in an appropriate manner, although no additional storage of these products is expected as part of the construction and site preparation activities. Any accidental petroleum (or other chemical) releases associated with site preparation will be addressed immediately in accordance with applicable regulations and the contingency plans in place at the Facility.

Throughout the Site Preparation, GFL will carry out construction activities in accordance with industry "best practices" and mitigation measures will be employed to prevent and/or reduce any environmental impacts. These include:

– Employing ESC measures to prevent sedimentation of local water ways
– Developing a Contingency Plan (including spill response) to address any accidents

5.6 Operation, Maintenance and Spill Response

Operations

The proposed operation would temporarily store waste within areas of secondary containment prior to ultimate offsite disposal at approved facilities both inside and outside of Nova Scotia. The annual handling capacity is estimated to be approximately 50,000 drum equivalents (205 L each) for materials inside the building. 2,000,000 L of flammable liquid materials are estimated to be handled as bulk loads (via vacuum truck or tanker) and delivered directly to the exterior certified tank farm. Volumes of containerized flammable liquids to be consolidated in the lab packing room and transferred via dedicated pump out space to the tank farm are included in the annual drum volume numbers.

WDG and WNDG would be picked up at customer sites and unloaded from the collection trucks into the contained areas in the Facility, sampled and consolidated (where required) in designated handling areas, and then subsequently shipped off-site for disposal. The wastes are expected to be solids, liquids, and gasses. Note gases would be in the form of aerosol cans and occasional gas cylinders;

these will only be repackaged in to consolidated waste containers, the individual “gas” products would not be processed. There are handling procedures in the Contingency Plan to prevent the damage of gas cylinders and potential releases of gases, including H_2S. The consolidation of wastes will only occur after confirmation that they are compatible; no incompatible liquid wastes will be consolidated.

All incompatible materials (i.e., flammables and oxidizers, acids and bases, water-reactive and aqueous solutions) will be segregated from each other at all times. There is a dedicated area that has an isolated sub slab sumps that will allow these incompatible materials to be separated and handled in dedicated handling areas. All consolidation and handling of wastes will occur in areas of secondary containment. A procedure is outlined in the Operations Manual, which is currently being finalized.

Waste materials that are collected in the secondary containment areas would be either consolidated in waste containers (solids, liquids) or sent for disposal or treatment (liquids, gasses). The site is not intended to be the final disposal location of any WDG or WNDG, although as noted wastewater treatment (under an already issued NSECC *Approval*) may occur to reduce the volume of wastes requiring disposal, where applicable. All waste storage and handing would occur in accordance with the Operations Manual and Contingency and Emergency Response Plan.

Throughout the Project life, GFL will carry out operations in accordance with industry “best practices” and mitigation measures will be employed to prevent and/or reduce any environmental impacts. These include:

– Developing a Contingency Plan (including spill response) to address any accidents

Maintenance

The proposed building and tank farm expansion would be incorporated into the GFL’s existing inspection, maintenance, and monitoring programs. Emergency response and management protocols for the specific addition will be built into existing plans for the facility. Response plans are discussed in further detail in the Contingency Plan in Appendix F.

All dedicated equipment will be inspected and maintained in accordance with manufacturers guidance and industry best standards. PPE, transfer equipment and other associated equipment will be inspected prior to use and on regularly scheduled intervals, as required. Tanks will be visually inspected daily and documented weekly on facility inspections. Primary containment devices (>5,000L) will be visually inspected every year, or as directed by applicable standards. Pads, pits and sumps are required to be cleaned and inspected at least annually. All secondary containment devices for liquids will be leak tested every five years.

There may be occasional minor service to the transportation equipment if a breakdown occurs on-site. Routine GFL owned transportation equipment maintenance and repair will occur at off-site locations.

Emissions, Effluents and Releases

Given the industrial nature of this site and it past/current activities, no significant increase in transportation traffic is expected. Generated air emissions (CO_2, CH_4, and N_2O) at the new facility would be mainly from on-road transportation (heavy duty motor gasoline and/or diesel fuel oil trucks) and other light mobile operation-related equipment (forklifts and loaders). Air emissions (CO_2, CH_4, and N_2O) may be generated by these mobile sources and fugitive dust. Emission levels will be managed through pollution control practices including reduced-idle time, regular inspection and maintenance of heavy-duty equipment and clean burning fuel. Noise may be generated by equipment operating at the site, however, will be managed within the recommended limits for facility operations as prescribed by NSECC. Overall, reduced emissions are expected as a result of waste consolidation prior to off-site disposal, since there will be efficient transportation of waste via full loads. Through the mitigation measures present, release of gases from handling gaseous waste are unexpected.

All collected stormwater associated with the Project operations will be managed and treated as appropriate (i.e. exterior secondary containment devices). Clean rainwater and other clean stormwater will be prevented from entering areas of secondary containment to the extent possible and directed to the NSDPW stormwater service in Aerotech Drive. As noted, the site will be graded towards new

stormwater catch basins. During these upgrades to the stormwater infrastructure, an emergency shut off valve and dedicated pump out control device will be installed in on the stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.

Since all waste handling will occur within secondary containment devices, no accidental releases of wastes into uncontrolled areas are expected. Gaseous wastes will be handled in designated areas, where ventilation has been incorporated in accordance with *NS Occupational Health and Safety Regulations*. Any liquids (or solids) that collect in the secondary containment devices will be tested to determine handling procedures. These materials will be consolidated with current wastes (for off-site disposal), or if possible, treated and discharged to the HW sanitary sewer if the testing complies with discharge limits. Under no circumstances will waste materials in secondary containment devices be released to exterior stormwater devices or other natural drainage systems. All effluent (from existing operations) is directed to the dedicated HW sanitary sewer. Although unlikely, it is possible that some liquid effluent may be released by an accident or malfunction that could lead to a spill emergency. Spills and leaks typically can be handled with onsite trained personnel and spill response equipment from onsite inventory such as shovels, floor dry, rags/wipes, etc. Leaking containers may be repacked in new drums or overpacked in existing drums. For larger spills and clean up, on site vacuum trucks and mobile wash equipment may be utilized to recover the product and wash down the affected area. The contingency and emergency response plan in Appendix F outlines further measures and specific spill response scenarios.

Monitoring and Management

There is a groundwater and surface water monitoring plan already in place for this Facility (as required by the other NSECC *Approvals*) and it will be reviewed and updated as required to be protective of any new project activities. Currently, the plan is comprehensive and captures the areas immediately downgradient of the new Project activities (including the location of the NSDPW stormwater discharge into the adjacent watercourse) as well as a suitable suite of chemical analysis; there are no updates anticipated.

The most ecologically sensitive area of the property is to the northwest of the Project Footprint, where there is a watercourse that runs from the northeast to southwest, briefly crossing the corner of PID 41195512, and eventually flowing into Preeper Pond (off-site to the west). There is a minimum of 20 m buffer between the proposed edge of the Project Footprint and this watercourse. As noted, appropriate sediment and erosion controls methods will be put in place during construction of the building and tank farm expansion to protect this adjacent watercourse. Exterior travel ways, where possible, will be graded towards permanent stormwater infrastructure (and away from the northwest corner). Potential discharges into the watercourse are already monitored through the existing surface water monitoring plan require at the site. Also, all operations are designed in manner to prevent release of wastes off-site that may ultimately impact this watercourse.

5.7 Decommissioning and Reclamation

The proposed Facility is intended for long-term (i.e., at least 20 years) operation based on ongoing favourable market conditions. Once a date for decommissioning has been established, consultation with the NSECC will be undertaken to help develop an official site decommissioning plan that meets all regulatory requirements. In general, the facility and any associated equipment will be appropriately decontaminated and potentially removed (or returned to CEIS) followed by any necessary site remediation. These activities will proceed in coordination with operation and/or decommissioning activities on the site as a whole.

6 Regulatory Framework

6.1 Federal

No work associated with the Project will involve Federal lands or federal funding. The Project is being carried out by a private company. No federal *Approvals* or permits are expected to be required for the proposed Project.

Table 6-1 Summary of Federal Legislation

Legislation	Requirement	Permit
Impact Assessment Act - IAA	Project not on federal land. Proponent is a private company. Project does not meet the criteria of a 'Designated Project' under item 56 or 57 of the *Physical Activities Regulations*; there will be no treatment, incineration, disposal or recycling of hazardous waste.	No
Fisheries Act - DFO	There are no watercourses in the Project Footprint, and there will be no water discharges from the Project Footprint into watercourses (or other stormwater devices) nor any Project interaction with navigable waters. There is a watercourse nearby (within the property boundaries), but mitigation measures will be employed to protect these natural features (i.e., secondary containment, spill kits, and an erosion and sediment control plan).	No
Canadian Navigable Waters Act - TC		
Species at Risk Act - ECCC	There are no SAR species present at the site.	No
Migratory Birds Convention Act - ECCC	There may be migratory birds present at the site and nearby, but no tree clearing, or other possible nest disturbance will occur at the site.	No
Transportation of Dangerous Goods Act - TC	There will be transportation of dangerous goods and/or chemicals out of the province by outside transportation services (non-GFL), as well as GFL. All regulations will be followed.	Yes, already in possession.
Canadian Environmental Protection Act - ECCC	There will be transportation of dangerous goods and/or chemicals out of the province. All regulations will be followed.	Yes, already in possession.

[1] IAA - Impact Assessment Agency of Canada
[2] DFO - Fisheries and Oceans Canada
[3] TC - Transport Canada
[4] ECCC - Environment and Climate Change Canada

6.2 Provincial

To proceed with this Project, a Class 1 EA is required, pursuant to the *Environment Act* as identified in Schedule A of the *Environmental Assessment Regulations*, Undertaking E.1 Waste Management (1) "*A facility for storing, processing, treating or disposing of waste dangerous goods that were not produced at that facility, except all of the following facilities: a) a facility operated by, or on behalf of, a municipality or Provincial agency for waste dangerous goods collected only from residential premises; b) a facility in which asbestos waste is stored, if waste dangerous goods are not otherwise processed, treated or disposed of at that facility; c) a facility in which lead acid battery waste is stored, if waste dangerous goods are not otherwise processed, treated or disposed of at that facility*".

In addition, the Proponent has an NSECC *Industrial Approval* for its current operations. As stated previously, GFL currently operates its facility under NSECC *Approval* Nos. 2015-093397-03 and 2023-3370913-02. An application for a separate (new) *Approval* for the WDG/WNDG activities will be submitted to NSECC once the Project has satisfied the requirements of the NSECC *Environmental Assessment Act*. All new tanks will be registered with NSECC (under the *Petroleum Management Regulations*), as required.

No other permits or *Approvals* are expected to be required from the Province for the Undertaking. If it is determined that additional permits or *Approvals* are required, the Proponent commits to obtaining all requisite *Approvals* prior to work.

Table 6-2 Summary of Provincial Legislation

Legislation	Requirement	Permit
Nova Scotia Environment Act - NSECC		
Environmental Assessment Regulations	Schedule A, Class I: Waste Management	Yes
Activities Designation Regulations - Dangerous Goods/Waste Dangerous Goods/Salvage Yard	The construction, operation or reclamation of a waste dangerous goods facility is a designated activity.	Yes
Activities Designation Regulations - Wetlands	There are no wetlands within the Project Footprint.	No
Activities Designation Regulations - Watercourses	There are no watercourses in the Project Footprint and no water discharges (or removals) from the site into (or from) watercourses due to the new proposed activities.	No
Activities Designation Regulations - Used oil	Salvageable used oil may be a by-product of the waste acceptance.	Yes, already in possession
Contaminated Sites Regulations	There is no expected contamination; all previous contaminated site requirements (by CEIS) have been addressed and closed.	No
Sulphide Bearing Materials Disposal Regulations	There is no expected bedrock disturbance, and no sulphide bearing bedrock is present.	No
Petroleum Management Regulations	Salvageable used oil may be a by-product of the waste acceptance.	Yes, already in possession
Nova Scotia Endangered Species Act - NSLF	There are no SAR species present at the site.	No
Wildlife Act - NSLF	There are no natural areas present at the site that support wildlife.	No
Special Places Protection Act - CCTH	Heritage research permits are not required as no new disturbance to natural areas will occur.	No
Nova Scotia Public Highways Act - NSDPW	The site and surrounding road network area have been designed and used for industrial purposes including heavy transportation equipment.	No
Dangerous Goods Management Regulations	There will be handling/storage operations of WDG in quantities that exceed these regulations.	Yes
Dangerous Goods Transportation Act and Regulations - NSDPW Vehicle Compliance Group	There will be transportation of dangerous goods and/or chemicals within the province. All regulations will be followed.	No
Occupational Health and Safety Act and Regulations - NSLSI	Workplace health and safety requirements.	Activity specific

[1] NSECC - Nova Scotia Environment and Climate Change
[2] NSLF - Nova Scotia Lands and Forests
[3] CCTH - Communities, Culture, Tourism and Heritage
[4] NSDPW - Nova Scotia Department of Public Works
[5] NSLSI - Nova Scotia Department of Labour, Skills and Immigration

6.3 Municipal

The Project is located within the HRM. The Project Footprint is zoned “AE-1” (Aerotech Core), commercial taxable. Only industrial and business land use is permitted in this zone. Surroundings lands are zoned “AE-4” Aerotech Business, “AE-2” General Airport, and “AE-H” Holding.

The Project Footprint has been used for waste handling (including used oil collection/storage and soil/wastewater treatment) for the past 20 years.

At the conclusion of the Project, the Project Footprint will be in a condition that it can be used for commercial or industrial purposes. Areas not intentionally left for future industrial land use would be decommissioned in accordance with the Facility’s reclamation plan.

The Project, including its final intended land use, embodies the goal and objectives of “Aerotech" being the Municipality's largest single commitment to growth, improved employment opportunities, and the long-term balancing of taxation, as defined in the Municipal Planning Strategy (HRM, 2023). GFL recognizes the importance of maintaining natural and sensitive environmental features, as such, the Project Footprint has been designed to avoid sensitive environmental features (wetlands and watercourses) through buffers and non-disturbance.

A Building permit will be required by HRM for expansion activities; however, no other municipal permits are required for the Project. No work associated with the Project will involve municipal funding.

7 Valued Environmental Components & Effects Management

7.1 Determination of Valued Environmental Components

A list of potential VECs was determined using a standard environmental assessment methodology. Potential VECs were assessed to determine if they may be present within the Study Area. Based on this information a determination was made as to which of the VECs would be included in the assessment of this project.

The identification of the project activities that may interact with the VECs is completed by identifying the various project components that may have a potential effect pathway to the receiving environment or component. The components are categorized to whether they occur during preparation, operation or decommissioning phases of the project. Project activities are compared to the list of VECs and the potential interactions are identified for further consideration in the impact assessment process.

Once the project and VEC interaction have been identified, potential impacts can be identified. Information about the VECs and the knowledge of the project activities are combined to determine and review potential adverse effects of the project.

Mitigation measures, which can be used to reduce the potential impacts of the project on the VECs, are identified. Mitigation measures can include both project design, construction practices or project specific measures and are implemented by the proponent to reduce the identified impacts.

The VECs for this project were identified based on the existing biophysical environment, the nature of the undertaking and input from stakeholders and include:

— Surficial Geology
— Surface Water Interactions
— Groundwater Interactions
— Aquatic Habitat
— Wetlands
— Species at Risk
— Air Quality and Noise
— Climate Change
— Economy
— Human Health
— Flora, fauna, geology, transportation, land use, culture and heritage, recreation and tourism (only existing conditions will be discussed since these are either not present or will not change)

In addition to the VECs listed above, a significant portion of the assessment deals with accidents/malfunctions, contingency planning and safety.

7.1.1 Residual Environmental Effects Determination and Characterization

Residual environmental effects are those effects that remain following the application of mitigation measures. They can be characterized based on their geographic extent, duration, frequency, reversibility and magnitude as outlined in Table 7-1.

Table 7-1 Residual Impacts Rating Criteria

CRITERIA	RATING TERM	DEFINITION
Magnitude	Negligible	No measurable impacts.
	Small	Impact likely to result in less than 1% change in regional resource.
	Medium	Impact likely to result in 1% to 10 % change in regional resource.
	Large	Impact likely to result in more than 10% change in regional resource.
Geographic Extent	Local	Effect is limited to the footprint of the Project Site and immediate surrounding area.
	Regional	Effect is limited to the Regional Study Area of the VEC.
Frequency	Rarely	Less than once per year.
	Intermittent	Less than once per week.
	Daily	Greater than once a day.
Duration	Short-Term	Effects only occur during construction, decommissioning, or as an isolated event during the operation and maintenance phase.
	Medium-Term	Effect lasts for the duration of the project, or during operation.
	Long-Term	Effect occurs for an undetermined time beyond project decommissioning.
Reversibility	Reversible	Effect is reversed after the activity ceases.
	Partially-Reversible	Effect is partially reversed after the activity ceases.
	Non-Reversible	Effect will not be reversed when activity ceases.

7.1.2 Significance of Residual Environmental Effects

Assigning residual impact significance is required to determine if a project has the potential to result in an adverse impact after implementing mitigation measures. A clear determination is made regarding whether or not the residual environmental effect is significant.

A rating system for describing the significance of adverse environmental effects was chosen, as presented in Table 7-2.

Table 7-2 Rating System for the Significance of Identified Adverse Environmental Effects

RATING TERM	DEFINITION
High	Potential impact could threaten sustainability of the resources and should be considered a management concern. Research, monitoring and / or recovery initiative should be considered.
Medium	Potential impact could result in a decline in resource to lower-than-baseline, but stable levels in a Study Area after project closure and into the foreseeable future. Regional management actions such as research, monitoring, monitoring and/or recovery initiatives may be required.
Low	Potential impact may result in slight decline in resource in Study Area during the life of the project. Research, monitoring and /or recovery initiatives would not normally be required.
Minimal	Potential impact may result in slight decline in resource in study are during the construction and decommissioning phase, but the resource should return to baseline levels.

7.2 Project-Environment Interactions and Valued Environmental Components (VECs)

Project pathways are determined by the assessor, based on experience and a firm understanding of the proposed project. Understanding the pathways allows identification of possible impacts on environmental receptors (VECs). Interactions are described in the following sections for pathways which occur in the construction and operations phases.

The site preparation / construction phase can potentially affect a broad range of VECs. While the construction phase of the project is generally short term in duration, impacts to VECs can be long term. Once the site preparation / construction phase of the project is complete, the operations phase will begin. Impacts in this phase are typically longer in duration than in the construction phase.

The potential project - VEC interactions are shown in Table 7-3.

Table 7-3 Summary of Valued Environmental Components and Interactions

PROJECT ACTIVITIES	VECS																	
	BIO-PHYSICAL												SOCIO-ECONOMIC					
	Surficial Geology	Bedrock	Surface Water	Groundwater	Wetlands	Flora	Fauna	Fish and Fish Habitat	Climate Change	Species at Risk	Air Quality	Noise	Economy	Land Use	Transportation	Recreation and	Human Health	Culture and Heritage
Site Preparation Phase																		
Building and Tank Farm Expansion, Site Grading	X		X		X						X	X					X	
Accidents	X		X	X	X	X	X	X			X						X	
Operations and Maintenance Phase																		
WDG and WNDG Handling and Storage									X		X	X	X				X	
Vehicle Transport											X	X	X		X		X	
Accidents	X		X	X	X	X	X	X			X						X	
Reclamation Phase																		
Dismantling and Removal of Equipment											X	X					X	

7.3 Biophysical Environment

7.3.1 Surficial Geology and Geology

7.3.1.1 Existing Conditions

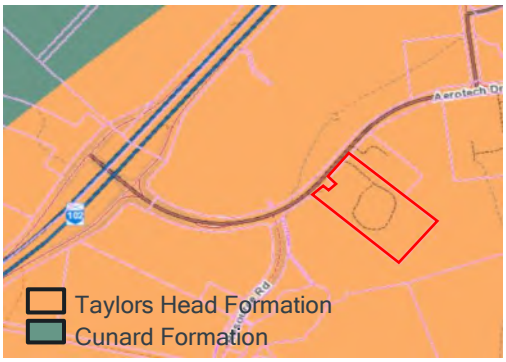
Surficial geology mapping (NSNR Map 2011-006) indicates that the native soils in this area are glacial deposits known regionally as Beaver River Till. Beaver River Till is described as a diamicton with a sandy matrix and locally derived clasts. The thickness of the units is approximately 0.5 metres to 5 metres; some areas include exposed bedrock and thicker units of locally derived till. Geologic mapping in the subject area from the 1980s (Stea et al) identified the overlying soils in the area of the GFL Facility as Slate Till which is equivalent to Beaver River Till. Surficial geology mapping is presented on Figure 1 (Appendix D).

The bedrock geology mapping of the area (Horn et al 2009) indicates that the site is underlain by the Meguma Supergroup of meta-sediments, specifically by Late NeoProterozoic to Middle Cambrian bedrock of the Taylors Head Formation of the Goldenville Group. This unit is described as undivided (massive) meta-sandstone, interbedded with green meta-siltstone and minor black slate. Large pyrite cubes are locally common; although, this bedrock type is not sulphide bearing (nor acid producing). This rock type has structures such as bedding and cleavage planes, which result in secondary porosity and permeability.

The geologic contact between the Taylors Head Formation and the Cunard Formation (Halifax Group) is present to the north of the site, crossing beneath Highway 102. The contact strikes in a northeast to southwest direction. The Cunard unit is finely laminated black slate with thinly bedded meta-siltstone/meta-sandstone layers. The Cunard Formation in the is sulphide bearing (and acid producing). Bedrock geology mapping is presented on Figure 7-1.

All areas of the Project Footprint have been disturbed in the past for Facility activities, and the soil conditions now consist of engineered fill. Based on the conditions observed at the Project Site (and neighbouring property) no bedrock will be encountered during building and tank farm expansion as they will be built as slab on grade.

Figure 7-1 Generalized Bedrock Geology



7.3.1.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

All areas of the Project Footprint have been disturbed in the past for facility activities. All fill materials will be removed to depths required by a geotechnical engineer to ensure structural stability of the new infrastructure. However, accidental spills may occur, and there is potential for erosion and sedimentation to occur during the site preparation phase of the Project.

We anticipate that bedrock will not be encountered during any phase of the undertaking.

To minimize any potential impacts from surficial geology, the following mitigation measures will be implemented during the site preparation and reclamation phases of the Undertaking:

- No work will be conducted outside the Project Footprint.
- Implement a site-specific ESC plan in accordance with practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites*. The ESC Plan will be adjusted as required, throughout the life of the Undertaking.
- Stockpiled materials (e.g., fill to be reused or new construction materials) will be stored in a manner to prevent mobilization of sediment laden surface water.
- Undertake regular maintenance of any ditches and other ESC measures to minimize sediment build-up.
- An emergency shut off valve and dedicated pump out control device will be installed in on the exterior stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this “closed system” will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.
- In the event of extreme precipitation, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered do not accumulate and overflow with precipitation.
- A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
- Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.

With the mitigation measures, any impact is anticipated to be negligible.

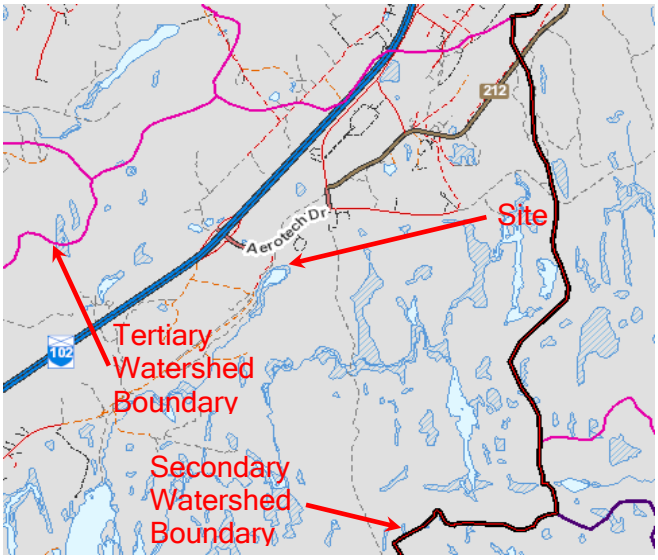
Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

7.3.2 Surface Water

7.3.2.1 Existing Conditions

Regionally, surface water flows (where they do not infiltrate directly into the ground) follow the general topography of the area, with tertiary watercourses and tributaries flowing into larger second and first order watercourses. The site is located in the Shubenacadie/Stewiacke primary watershed (1DG), the Shubenacadie R. (1DG-1) secondary watershed and is located in the middle of the tertiary watershed (1DG-1-GG). The Atlantic Canada Conservation Data Centre (ACCDC) report also showed the project area as being within the East Hants Regional Municipal Water Supply. Although the Project Site is within the Shubenacadie River secondary watershed, it is not in the source protection zones.

Figure 7-2 Watershed boundaries



In general, there are minimal surface water flows present at the Project Site other than the unnamed watercourse that flows from north to south, crossing the subject property boundary in the top left corner. This watercourse originates from a borrow pit located on the north side of Highway 102 and collects stormwater from Highway 102. It flows beneath Aerotech Drive through two 1100-mm concrete culverts. It eventually discharges into Preeper Pond (approximately 250m to the southwest of the site). Catch basins in Aerotech Drive between Perrin Drive and the adjacent property at 209 Aerotech Drive collect stormwater and discharge it to the unnamed watercourse through a 600-mm culvert. A HW sanitary sewer emergency overflow pumping station is present to the west of the site building (on Aerotech Drive). Although it has been reported by HW that this pumping station has not been in emergency overflow since it was upgraded (prior to 2016), in overflow conditions, it would discharge to a wetland immediately adjacent to the site (that discharges to the watercourse).

No surface water features are present in the Project Footprint; the unnamed watercourse is to the west of the Project Footprint (Figure 1, Appendix D). No discharge of effluent nor waste is directed towards the watercourse. One catch basin in the paved parking lot (north of the building) discharges to the stormwater system in Aerotech Drive. The remainder of the site water (in un-paved areas) is directed to the ditch along the southwest property line; this water is currently tested and collected for treatment (if necessary). All wastewater handling occurs within secondary containment devices; any collected water from the secondary containment devices is directed into the treatment system or collected for off-site disposal.

The current *Industrial Approvals* do not mention any setbacks from watercourses, however HRM requires a minimum 20 m setback from the ordinary highwater mark of any watercourse. The existing infrastructure currently satisfy this requirement, and the proposed Project Footprint has been designed to also satisfy the 20 m setback requirement from all watercourses.

Surface water monitoring is conducted within the watercourse and the interceptor ditch quarterly, as part of monitoring requirements for the existing *Approvals*. During the monitoring events, Englobe personnel measure the surface water locations for temperature, pH, conductivity and dissolved oxygen. Where sufficient water is present, surface water samples are collected for laboratory analysis. Laboratory testing parameters include analysis of total metals, mercury, general chemistry, bromide, total suspended solids (TSS), total dissolved solids (TDS), polycyclic aromatic hydrocarbons (PAHs) and petroleum hydrocarbons (PHCs) including benzene, toluene, ethylbenzene and xylenes (BTEX), and modified TPH.

7.3.2.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

The undertaking will not alter the regional surface water flow pattern. There is not expected to be any water discharges from the site due to the new proposed activities. However, accidental spills may occur at the site which could present a risk to surface water quality in the surrounding area, and there is potential for erosion and sedimentation to occur during the site preparation phase of the Project.

Stormwater is not directed towards surface water resources. All effluent (from existing operations) is directed to the HW sanitary sewer. Wastes collected from secondary containment would be consolidated for off-site disposal or (if liquid) treated onsite with the effluent being discharged to the HW sanitary sewer if it satisfies the HW discharge criteria. Upgrades to the exterior site grading will be carried out as part of the work, ensuring that the operations yard is graded towards exterior stormwater catch basins, where possible. During upgrades to the stormwater infrastructure, an emergency shut off valve and dedicated pump out control device will be installed in on the stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.

The current monitoring program will continue in the future independent of this Project, and results from these sampling events will serve to verify that there are no effects to surface water from this Project. Based on the current sample locations and monitoring program, no additional sampling is required to verify that the Project activities are not impacting surface water resources.

To minimize any potential impacts to surface water, the following mitigation measures will be implemented:

- No work will be conducted outside the Project Footprint.
- Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change.
- Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases.
- An emergency shut off valve and dedicated pump out control device will be installed in on the exterior stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.
- In the event of extreme precipitation, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered do not accumulate and overflow with precipitation.
- A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
- Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

7.3.3 Groundwater

The regional aquifer is located in the unconfined till and shallow, weathered and fractured bedrock which is composed of metamorphosed rock (metasandstone and metasiltstone) of the Goldenville Group. The recharge of this aquifer is located where the bedrock is exposed close to the surface. Outcrops along Aerotech Drive and along Highway 102 represent recharge zones. Surficial deposits in

the area are composed of till (moraine or silt till). Much of the shallow groundwater at the site is found at the contact of till and weathered bedrock (at a depth of 1.5 m or less). Groundwater in the bedrock is directed by the open fractures which are most often at the surface of the bedrock. When there is less fracturing developed in the rock, groundwater may pond and/or migrate along the bedrock surface. Since the topography is somewhat steep and the shallow groundwater is close to the surface, it is likely that there will be resurgence of groundwater on the lands west of the Facility, either in the wetlands or directly to the watercourse. Groundwater ultimately flows to the west towards the unnamed watercourse, and south to southwest towards Preeper Pond. Groundwater is not used at the site (or nearby surrounding area) for potable water purposes.

Groundwater monitoring is conducted from installed monitor wells throughout the site quarterly, as part of monitoring requirements for the existing *Approvals*.

During the monitoring events, Englobe personnel monitor the groundwater wells for static water level and field parameters (pH, conductivity, temperature, dissolved oxygen and redox potential (Eh)). The groundwater is sampled for laboratory analysis. Laboratory testing parameters include analysis of dissolved metals, dissolved mercury, general chemistry, bromide, TSS, PAHs and PHCs.

7.3.3.1 Predicted Environmental Effects, Proposed Mitigation and Monitoring

The undertaking is not expected to adversely affect the groundwater resources. Site preparation for the building expansion will not extend into the groundwater table. However, accidental spills may occur at the site which could present a risk to water quality in the surrounding area.

The current monitoring program will continue in the future independent of this Project, and results from these sampling events will serve to verify that there are no effects to groundwater from this Project. Based on the current sample locations and monitoring program, no additional sampling is required to verify that the Project activities are not impacting groundwater resources.

To minimize any potential impacts to groundwater, the following mitigation measures will be implemented:

- No work will be conducted outside the Project Footprint.
- Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases.
- A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

7.3.4 Wetlands

There are no wetlands present within the Project Footprint, however there is one small wetland present within the subject property boundaries, in the northwest corner adjacent to the HW sanitary sewer emergency overflow pumping station. There are also several wetlands on the adjacent property to the west (see Figure 1, Appendix D).

7.3.4.1 Predicted Environmental Effects, Proposed Mitigation and Monitoring

The undertaking will not require altering of any wetlands. However, accidental spills may occur at the site which could present a risk to wetlands in the surrounding area, and there is potential for erosion and sedimentation to occur during the site preparation phase of the Project.

To minimize any potential impacts to wetlands, the following mitigation measures will be implemented:

– No work will be conducted outside the Project Footprint.
– Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change.
– Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases.
– A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
– Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

7.3.5 Flora, Habitat and Species at Risk

7.3.5.1 Existing Conditions

All areas of the Project Footprint have been disturbed in the past for Facility activities; most areas of the larger Facility site have also been disturbed in the past and only a small area in the northwest corner of the site has never been previously disturbed. Other than the small undisturbed area (which is outside the Facility fencing) noted above, there is no vegetation present at the Project Site and overall Facility; these areas are all paved, landscaped (grass) or gravel surfaced.

The ACCDC provided information on recorded significant plant species and habitats found within a 5 km radius of the property; a copy of the ACCDC report is provided in Appendix E. The ACCDC information is summarized in Table 7-4.

There are no flora species in the Project Footprint nor at the Facility (other than manicured grass); no rare or unusual plant species are present.

One of the flora species at risk (SAR) in the ACCDC report for observations within a 5 km radius of the site is considered a location-sensitive species (species for which their specific location is not reported to the public, for the species' protection): *Fraxinus nigra* (black ash). NSNRR was contacted with regards to core habitat for this species and a response was received stating that there is no core habitat in or near the Project Site, and that there is black ash core habitat approximately 1 km to the southwest of the Project Site (NSNRR, personal communication).

7.3.5.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

The existing small, undisturbed area outside the Facility fencing is not within the Project Footprint and will not be disturbed. No federally or provincially listed rare plants are present at the Project Site. However, accidental spills may occur at the site which could present a risk to flora and SAR in the surrounding area, and there is potential for erosion and sedimentation to occur during the site preparation phase of the Project. These may impact flora or SAR in areas adjacent to the site.

To minimize the impacts to vegetation and to protect the adjacent vegetation and habitat features from being impacted from construction activities, the following mitigation measures will be implemented:

— No work will be conducted outside the Project Footprint.
— Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites and* adjust surface water, erosion and sediment control measures accordingly if conditions change.
— Secondary containment will be used in all areas where waste is delivered or handled to prevent spills or accidental releases.

Table 7-4 Summary of ACCDC flora species

Species		Conservation Status			Habitat Preference	Present
Common Name	Scientific Name	Federal Status		Provincial Status		
		SARA	COSEWIC			
Blue Felt Lichen	*Pectenia plumbea*	SC	SC	S3 (V)	Cool, humid woodlands that may be mixed coniferous/hardwood or dominated by deciduous trees. Prefers mature deciduous trees, particularly maple, ash and yellow birch.	No; there is no vegetation in the Project Footprint.
Flat-leaved Peat Moss	*Sphagnum platyphyllum*			S2	Typically in minerotrophic habitats such as shores of lakes, ponds, streams, margins of open fens, especially seasonally flooded sites.	No; there is no vegetation in the Project Footprint.
Blistered Tarpaper Lichen	*Collema nigrescens*			S3	Acid, or ±weakly nutrient-rich bark in riparian or coastal situations, occasionally on rocks	No; there is no vegetation in the Project Footprint.
Pompom-tipped Shadow Lichen	*Phaeophyscia pusilloides*			S3	Bark. Can be found on trees, logs, and mosses in most of southern Canada and eastern United States.	No; there is no vegetation in the Project Footprint.
Black Ash	*Fraxinus nigra*		T	S1S2 (T)	Swamps, floodplains and fens. Most sites are flood prone, where its high tolerance of seasonal flooding appears to offer a competitive advantage.	No; there is no vegetation in the Project Footprint. No nearby locations nor core habitat as verified by NSNRR.
Pennsylvania Sedge	*Carex pensylvanica*			S1?	Dry to moist woods.	No; there is no vegetation in the Project Footprint.
Michaux's Dwarf Birch	*Betula michauxii*			S3	Sphagnum bogs, around pools, and wet peaty meadows.	No; there is no vegetation in the Project Footprint.
Southern Twayblade	*Neottia bifolia*			S3	Shaded sphagnum moss of bogs or damp woods.	No; there is no vegetation in the Project Footprint.

Notes:
E - Endangered
T - Threatened
SC - Special Concern
V - Vulnerable
S1 - Provincially Critically Imperiled
S2 - Provincially Imperiled
S3 - Provincially Vulnerable
S4 - Provincially Apparently Secure
S5 - Provincially Secure
M - Migrant
B - Breeding
N - Nonbreeding
SU - Unrankable
SNA - Not Applicable
NAR - Not at risk

– A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
– Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

7.3.6 Fauna, Habitat and Species at Risk

7.3.6.1 Existing Conditions

All areas of the Project Footprint have been disturbed in the past for Facility activities; most areas of the larger Facility site have also been disturbed in the past and only a small area in the northwest corner of the site has never been previously disturbed. Other than the small undisturbed area (which is outside the Facility fencing) noted above, there is no vegetation present at the Project Site and overall Facility; these areas are all paved, landscaped (grass) or gravel surfaced.

The ACCDC provided information on recorded significant fauna species and habitats found within a 5 km radius of the property; a copy of the ACCDC report is provided in Appendix E. The ACCDC information is summarized in Table 7-5.

No rare or unusual fauna species were observed on the site.

There was potential for snake hibernaculum (*Thamnophis sauritus* (Eastern Ribbonsnake)) to be present within 5 km of the site based on the location sensitive species information provided by ACCDC. NSNRR was contacted with regards to occurrences for this species and a response was received stating that they were unable to locate any occurrences and that this area would not be an area Ribbonsnake are commonly found in (NSNRR, personal communication).

7.3.6.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

The existing small, undisturbed area of the outside the Facility fencing is not within the Project Footprint and will not be disturbed. No federally or provincially listed rare fauna are present at the Project Site. However, accidental spills may occur at the site which could present a risk to fauna and SAR in the surrounding area, and there is potential for erosion and sedimentation to occur during the site preparation phase of the Project.

To minimize the impacts to vegetation and to protect the adjacent vegetation and habitat features from being impacted from construction activities, the following mitigation measures will be implemented:

– No work will be conducted outside the Project Footprint.
– Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change.
– Secondary containment will be used in all areas where waste is delivered or handled to prevent spills or accidental releases.
– A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
– Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

Table 7-5 Summary of ACCDC fauna species

Species		Conservation Status			Habitat Preference	Present
Common Name	Scientific Name	Federal Status		Provincial Status		
		SARA	COSEWIC			
Birds						
Bank Swallow	*Riparia riparia*	T	T	S2B (E)	Breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts and stockpiles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures and agricultural cropland).	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Rusty Blackbird	*Euphagus carolinus*	SC	SC	S2B (E)	Moist woodland (primarily coniferous), bushy bogs and fens, and wooded edges of water courses and beaver ponds.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Barn Swallow	*Hirundo rustica*	T	SC	S3B (E)	Nest in or on an artificial structure, including barns and other outbuildings, garages, houses, bridges and road culverts. Barn swallows prefer various types of open habitats for foraging, including grassy fields, pastures, various kinds of agricultural crops	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Canada Warbler	*Cardellina canadensis*	T	SC	S3B (E)	Breeding habitat includes moist thickets of woodland undergrowth (especially aspen poplar), bogs, tall shrubbery along streams or near swamps, and deciduous second growth.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Common Nighthawk	*Chordeiles minor*	SC	SC	S3B (T)	Nests in both rural and urban habitats including coastal sand dunes and beaches, logged forest, recently burned forest, woodland clearings, prairies, plains, grasslands, open forests, and rock outcrops. They also nest on flat gravel rooftops.	No; although the Project Site has gravel covered areas, the Project Footprint and most areas of the Project Site are heavily travelled daily with trucks and other equipment.
Olive-sided Flycatcher	*Contopus cooperi*	T	SC	S3B (T)	Edges of coniferous or mixed forests with tall trees or snags for perching, alongside open areas, or in burned forest with standing trees and snags.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Bobolink	*Dolichonyx oryzivorus*	T	SC	S3B (V)	Breeding habitat includes moderate to tall vegetation, moderate to dense vegetation, and moderately deep litter, lacking woody vegetation.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.

Species		Conservation Status			Habitat Preference	Present
Common Name	Scientific Name	Federal Status		Provincial Status		
		SARA	COSEWIC			
Evening Grosbeak	*Coccothraustes vespertinus*	SC	SC	S3B S3N S3M (V)	Coniferous (primarily spruce and fir) and mixed coniferous- deciduous woodland, second growth, and occasionally parks; in migration and winter in a variety of forest and woodland habitats, and around human habitation.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S3S4B (V)	Wide variety of wooded upland and lowland habitats including deciduous, coniferous, or mixed forests. Occurs most frequently in forests with some degree of openness, whether it be the result of forest structure, natural disturbance, or human alteration.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Common Tern	*Sterna hirundo*		NAR	S3B	Seacoasts, estuaries, bays, lakes, rivers, and marshes. Nests on sandy, pebbly, or stony beaches, matted vegetation, marsh islands, and grassy areas; typically, on isolated, sparsely vegetated islands in large lakes or along coast, also in rivers. Breeds successfully on human-made islands, including navigational aids or cribs.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Warbling Vireo	*Vireo gilvus*			S1B SUM	Open deciduous and mixed deciduous-coniferous woodland, riparian forest and thickets, pine-oak association, orchards, and parks.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Vesper Sparrow	*Pooecetes gramineus*			S1S2B SUM	Plains, dry shrublands, weedy pastures, fields, arid scrub, and woodland clearings.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Brown-headed Cowbird	*Molothrus ater*			S2B	Breeding habitat includes woodland, forest (primarily deciduous), forest edge, city parks, suburban gardens, farms, and ranches. Cowbirds often are associated with forest-field edge habitat and clearings in forests.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Cliff Swallow	*Petrochelidon pyrrhonota*			S2S3B	Open to semi-open wooded habitat, cliffs, canyons, and farm country, generally near meadows, marshes, and water. They build bottle-shaped mud nest in colonies on cliffs, under eaves of buildings, under bridges, and similar sites sheltered by an overhang. Many return to same nesting area in successive years, but colonies tend to switch nesting sites between seasons, evidently due to a buildup of insect parasites in the nests. Cliff swallow commonly repair and use old nests.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.

Species		Conservation Status			Habitat Preference	Present
Common Name	Scientific Name	Federal Status		Provincial Status		
		SARA	COSEWIC			
Canada Jay	*Perisoreus canadensis*			S3	Boreal and subalpine forests, usually where black or white spruce trees are common. Other tree species often found in its habitat include aspen, white birch, balsam fir, sugar maple, lodgepole pine, jack pine, red spruce, Engelmann spruce, Sitka spruce, eastern white cedar, yellow cedar, alpine fir, amabilis fir, and mountain hemlock.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Boreal Chickadee	*Poecile hudsonicus*			S3	Boreal coniferous and mixed forests, muskeg bogs, vicinity of white cedar and hemlock swamps, birches and streamside willows. Nests in natural cavities or abandoned woodpecker holes, or in cavity dug in rotten tree stub.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Pine Siskin	*Spinus pinus*			S3	Habitats include various forests and woodlands, parks, and gardens and yards in suburban areas. In migration and winter, this species occurs in a variety of woodland and forest habitats, partly open situations with scattered trees, open fields, pastures, and savanna.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Killdeer	*Charadrius vociferus*			S3B	Various open areas such as fields, meadows, lawns, pastures, mudflats, and shores of lakes, ponds, rivers, and seacoasts. Nests are on the ground in open dry or gravelly situations, sometimes in similar situations on roofs, driveways, etc.	No; although the Project Site has gravel covered areas, the Project Footprint and most areas of the Project Site are heavily travelled daily with trucks and other equipment.
Black-billed Cuckoo	*Coccyzus erythropthalmus*			S3B	Forest edge and open woodland, both deciduous and coniferous, with dense deciduous thickets. Found in extensive tracts of dry upland woods where it uses the midstory canopy and the overstory canopy for most activities.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Eastern Kingbird	*Tyrannus tyrannus*			S3B	Forest edge, open situations with scattered trees and shrubs, cultivated lands with bushes and fencerows, and parks.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Rose-breasted Grosbeak	*Pheucticus ludovicianus*			S3B	Second-growth woods, mature forest edge, borders of swamps and wooded streams, dense growths of small trees, gardens and parks, old orchards. In migration and winter in various forest, woodland, and scrub habitats; avoids interior of closed forest.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.

Species		Conservation Status			Habitat Preference	Present
Common Name	Scientific Name	Federal Status		Provincial Status		
		SARA	COSEWIC			
American Kestrel	*Falco sparverius*			S3B S4S5M	Migratory raptor. During breeding, it prefers open or partly open habitat; prairies, deserts, wooded streams, burned forest, cultivated lands and farmland with scattered trees, open woodland, along roads, sometimes in cities.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Wilson's Snipe	*Gallinago delicata*			S3B S5M	During non-breeding wet meadows, flooded fields, bogs, swamps, moorlands, and marshy banks of rivers and lakes. During Breeding nests in tussock of vegetation in or at edge of marsh, wet meadow, or bog.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Wilson's Warbler	*Cardellina pusilla*			S3B S5M	Habitat includes semi-open areas in moist woodlands, bogs with scattered trees, willow and alder thickets, and areas with similar vegetation structure.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Pine Grosbeak	*Pinicola enucleator*			S3B S5N S5M	The Pine Grosbeak habitats includes open coniferous (less commonly mixed coniferous-deciduous) forest and forest edge; in migration and winter also in deciduous forest, woodland, second growth and shrubbery.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Cape May Warbler	*Setophaga tigrina*			S3B SUM	Habitat includes primarily forests of spruce and/or fir, typically in stands > 50 years old, > 15 m tall, with well-developed crowns and some trees that rise above canopy for use as singing posts. Trees may be scattered or dense; also found near forest edge, especially if birches or hemlocks are present and more open land with small trees. Proliferates in areas heavily infested by spruce-budworms and may not occur after the outbreak has subsided.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Reptiles and Amphibians						
Snapping Turtle	*Chelydra serpentina*	SC	SC	S3 (V)	Prefer slow-moving waterways with a soft mud or sand bottom and abundant aquatic vegetation. Occupied water bodies are typically shallow but can also be found along the edges of deep lakes. Typical water bodies include fens, bogs, swamps, marshes, permanent or temporary ponds, and shallow bays of lakes and rivers. Nest in open-canopy habitats with high sun exposure, such as in forest clearings, meadows, shorelines, rock outcrops, agricultural fields and the	No; there is no habitat in the Project Footprint or the fenced area of the Facility.

Species		Conservation Status			Habitat Preference	Present
Common Name	Scientific Name	Federal Status		Provincial Status		
		SARA	COSEWIC			
					shoulders of roads. The nest sites are typically within a few hundred metres of a wetland or water body.	
Four-toed Salamander	*Hemidactylium scutatum*		NAR	S3	Adults live under objects or among mosses in swamps, boggy streams, and wet, wooded or open areas near ponds or quiet, mossy or grassy/sedgy pools (the larval habitat). Sphagnum moss is commonly abundant in suitable habitat.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Snake hibernaculum (Eastern Ribbonsnake)	*Thamnophis sauritus*	T		(T)	Semi-aquatic, frequenting edges of ponds, streams, marches, swamps or bogs.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.
Invertebrates						
Monarch	*Danaus plexippus*	SC	E	S2?B S3M (E)	Habitat is a complex issue for this species. In general, breeding areas are virtually all patches of milkweed in North America and some other regions. The critical conservation feature for North American populations is the overwintering habitats (Mexico and California). Adult feeding is nectar from all milkweeds and early and late in the season, Monarchs visit a variety of flowers. Caterpillar hosts are exclusively milkweed.	No; there is no habitat in the Project Footprint or the fenced area of the Facility.

Notes:
E - Endangered
T - Threatened
SC - Special Concern
V - Vulnerable
S1 - Provincially Critically Imperiled
S2 - Provincially Imperiled
S3 - Provincially Vulnerable
S4 - Provincially Apparently Secure
S5 - Provincially Secure
M - Migrant
B - Breeding
N - Nonbreeding
SU - Unrankable
SNA - Not Applicable
NAR - Not at risk

7.3.7 Fish, Fish Habitat and Species at Risk

7.3.7.1 Existing Conditions

No fish habitat is present in the Project Footprint or the Project Site. The nearby unnamed watercourse to the west of the Project Footprint is considered fish habitat but is not documented to provide SAR habitat.

As previously noted, the Project Footprint has a setback of a minimum of 20m from any watercourse. No discharge of effluent nor waste is directed towards the watercourse. Currently, one catch basin in the paved parking lot (north of the building) discharges to the stormwater system in Aerotech Drive (and ultimately to the watercourse). The remainder of the site water (in un-paved areas) is directed to the ditch along the southwest property line; this water is currently tested and collected for treatment (if necessary).

All wastewater handling occurs within secondary containment devices; any collected water from the secondary containment devices is directed into the treatment system (and discharged to the HW sanitary sewer) or shipped off-site to an approved disposal facility.

7.3.7.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

The undertaking will not alter any surface water nor fish habitat. However, accidental spills may occur at the site which could present a risk to water quality in the surrounding area, and there is potential for erosion and sedimentation to occur during the site preparation and reclamation phases of the Project. Upgrades to the exterior site grading will be carried out as part of the work, ensuring that the operations yard is graded towards exterior stormwater catch basins, where possible. During upgrades to the stormwater infrastructure, an emergency shut off valve and dedicated pump out control device will be installed in on the stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this “closed system” will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.

The current monitoring program will continue in the future independent of this Project, and results from these sampling events will serve to verify that there are no effects to surface water from this Project. Based on the current sample locations and monitoring program, no additional sampling is required to verify that the Project activities are not impacting surface water resources.

To minimize any potential impacts to surface water, the following mitigation measures will be implemented:

- No work will be conducted outside the Project Footprint.
- Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change.
- Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases.
- An emergency shut off valve and dedicated pump out control device will be installed in on the exterior stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this “closed system” will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.
- In the event of extreme precipitation, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered do not accumulate and overflow with precipitation.

– A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
– Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Short-term	N/A

7.3.8 Atmospheric Conditions/Air Quality

7.3.8.1 Existing Conditions

The site is currently operating under two *Industrial Approvals* for oil collection/storage and water treatment. Emissions are being managed by properly operating equipment and are being carried out in accordance with the Terms and Conditions of those *Approvals*. The Project Site is located in a Business Park, which is zoned (AE-1) for commercial and industrial lands uses. There are no nearby residential dwellings.

The Study Area is located approximately 12 km north of Lake Major, where the nearest Ambient Air Quality monitoring station (030120) is located. The station is operated by the Nation Air Pollution Surveillance (NAPS) program and measures various ambient air nitrogen oxides (NO_x), nitric oxide (NO), Nitrogen dioxide (NO_2), ozone (O_3) and particulate matter less than or equal to 2.5 ($PM_{2.5}$). Available data from Station 030120 are summarized in Table 7-6, for August to September 2024, and annually (September 2023 to September 2024).

Table 7-6 Summary of Air Quality Data for the NAPS station in Lake Major, NS (030120)

Kentville (031101)	NO_x ppb	NO ppb	NO_2 ppb	O_3 ppb	$PM_{2.5}$ ug/m^3
Monthly Minimum	-0.1	0.0	-0.2	13.8	2.4
Monthly Maximum	12.7	8.2	4.3	33.6	10.1
Monthly Average	1.4	0.4	0.9	20.8	5.2
Annual Average	1.5	0.4	1	28	4

7.3.8.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

Potential impacts to local air quality may be caused due to airborne dust and GHG emissions during site construction and later, operations.

During construction, mainly exhaust emissions from heavy-duty motor gasoline and/or diesel fuel oil equipment (trucks, excavators, etc.) and fugitive dust could affect air quality on the Project Footprint. The GHG emission will be of short-term duration and will be managed through pollution control practices.

During operations, GHG emissions and fugitive dust may be generated by mobile sources during waste handling (forklifts and loaders) and on-road transportation (gasoline and/or diesel fuel oil trucks). Air emissions will be of continuous basis and limited to operating hours. Emission levels during operations will be managed through pollution control practices. The impacts during operation could affect air quality on the Project Footprint; however, the overall objective of the Project is to consolidate waste transport from the site (and regional area) prior to shipping to a final (licensed) disposal facility. This may result in decreased of future GHG emissions from on-road mobile sources with reduction on climate effects from the waste disposal sector. There are handling procedures in the Contingency Plan to prevent the damage of gas cylinders and potential releases of gases.

Dust has the potential to negatively impact air quality with subsequent potential impacts to human health and flora (dust deposition). Excessive dust generation is not expected to occur. The disturbed area will be kept to a minimum as much as possible during the preparation phase. Once the site preparation phase is complete, transportation trucks will travel on predominately paved surfaces and the small area onsite that is a gravel surface will be managed with suppressant materials, as required.

To minimize the impacts from site preparation and operations activities, the following mitigation measures will be implemented:

- Minimize the extent of disturbance for Project.
- Use water and/or other approved dust suppressants to reduce and manage dust levels when required during site preparation. Oil or calcium chloride will not be used for dust suppression.
- Control (GFL) vehicle speed on the transportation route to improve fuel efficiency (and reduce GHG emissions); dust is not a concern on paved roadways.
- Maintain the equipment in good working condition to reduce emissions.
- Use properly sized and maintained equipment; idling of equipment and vehicles will be kept to a minimum.
- GFL will conduct particulate monitoring on an “as required” basis through high volume sampling when requested by NSECC.
- GFL will take measures to mitigate odours “as required” by NSECC.
- Maintain the current sign indicating proponent contact information in case of concern or complaint.
- A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Daily (during site preparation)	Short-term	Reversible
Negligible	Local and Regional	Daily (during operations)	Medium-term	Reversible

7.3.9 Noise

7.3.9.1 Existing Conditions

The Project Footprint located in a Business Park, which is zoned (AE-1) for commercial and industrial lands uses. There are no nearby residential dwellings. The site is currently operating under two *Industrial Approvals* for oil collection/storage and water treatment, and there have not been any noise complaints. Noise from current operations would be from heavy equipment and on- and off-site truck transportation.

Sound is expressed as a logarithmic basis, so the result of increasing a sound intensity by 2 (or doubling) is raising its level by 3 dBA and increasing sound intensity by a factor of 10 raises its level by 10 dB. Table 7-7 lists some normal outdoor sounds.

Table 7-7 Normal outdoor and construction sounds

Routine Background Activity	Noise Level (dBA)
Threshold of hearing	0
Rural Ambient background (7am-7pm)	45
Normal conversation (1m)	60
Vacuum	75
Automobile (60 km/h, at 20m)	65

Project Related Activity	Noise Level (dBA)
Front End Loader (at 15m)	80
Diesel truck (50 km/hr at 20m)	85

Routine Background Activity	Noise Level (dBA)
Tractor	85
Lawn mower (at 1m)	110
Jet plane (at 30m)	130

7.3.9.2 Predicted Environmental Effects, Proposed Mitigation and Monitoring

Noise will be generated during site preparation and operations by the movement of vehicles and heavy equipment used on site.

To minimize the impact of noise during site preparation and operations, the construction and transportation equipment will be kept in good operating condition. Truck loading patterns will be optimized to reduce backing up.

Operations with similar levels of noise are already occurring in surrounding areas; no additional noise impacts are anticipated.

Operations at the Project Footprint (and transportation route) will be limited to the daylight working hours (7am to 6pm). Reducing speed limits on roadways and increasing enforcement of speed limits is often the most effective and cost-efficient means of reducing noise. All GFL trucks are equipped with a GPS transponder that is capable of determining truck speed.

The anticipated additional noise is not expected to be greater than that already experienced. The operations will not exceed the permissible sound levels for Industrial presented in the *NSECC Guidelines for Environmental Noise Measurement and Assessment*, as presented in Table 7-8.

Table 7-8 NSECC Permissible Sound Levels

Geographic classification	LAeq $_{(1\ hour)}$ dBA (including $L_{LM(x\text{-}hrs)}$ dBAI)		
	0700 to 1900 hrs	1900 to 2300 hrs	2300 to 0700 hrs
Rural	53	48	40
Urban residential	58	53	45
Industrial	65	60	55

*The permissible sound levels are the maximum comprehensive sound levels that are permitted to be experienced at receptor locations (NSECC, 2023).

To minimize the impacts from site preparation and operations activities, the following mitigation measures will be implemented:

- No work will be conducted outside the Project Footprint.
- Control vehicle speed on the Project Site.
- Control vehicle speed on the transportation route to reduce noise.
- Maintain the equipment in good working condition.
- Use properly sized and maintained equipment; idling of equipment and vehicles will be kept to a minimum.
- GFL will conduct noise monitoring on an “as required” basis when requested by NSECC.
- Maintain the current sign indicating proponent contact information in case of concern or complaint.

With the mitigation measures the impact will not increase over the current level of noise and is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Rarely	Medium-term	N/A

7.4 Socio-Economic Environment

7.4.1 Economy

The Study Area is located in a predominately un-inhabited area north of the community of Miller Lake West, and south of the community of Enfield, in the HRM. It is within the Aerotech Industrial Park, which is the Municipality's largest single commitment to growth, improved employment opportunities, and the long-term balancing of taxation. Within the Aerotech Industrial Park, HRM intends to provide sites for the development of industries at the leading edge of modern technology, as well as for uses which will substantially benefit from the airport location (HRM, 2023).

The Project is an important component of the waste disposal sector and provides a safe place for hazardous wastes to be consolidated and stored before being shipped to approved facilities for disposal. By consolidating wastes safely, workers can fill the metal drums to a greater capacity, therefore reducing the number of drums needed for disposal. By disposing of waste more efficiently, environmental impacts of transportation can be reduced, which also realizes cost savings.

This project will support the other GFL facilities and waste disposal operations and provides direct and indirect employment for GFL's workers and suppliers. Currently, there are 15 to 20 employees at the facility, and the proposed expansion is anticipated to result in at least double the amount of jobs (anticipated an additional 20 jobs). The current project is expected to operate for at least the next 20 years, followed by the repurposing of the site to operate in an industrial/business capacity.

7.4.2 Land Use

The Project Site is currently used as an oil collection/storage and water treatment/discharge facility (industrial capacity). It is zoned "AE-1" (Aerotech Core); the land use or municipal zoning will not be changing. The end use of the Project Footprint (once waste handling/treatment concludes) is industrial or business.

No land use impacts are anticipated. Signage is already posted indicating proponent contact information in case of concern or complaint.

7.4.3 Transportation

No significant additional truck traffic is anticipated as a result of this expansion, as additional transport loads are offset by increased transport efficiency. The area is already designed to accommodate trucking and transportation and is located on a major transportation hub.

7.4.4 Recreation and Tourism

There are no parks or formal recreation activities conducted in the immediate surrounding area.

There are no anticipated recreation and tourism impacts.

7.4.5 Human Health

GFL intends to continue to use the Project Site for the purpose of wastewater treatment (with discharge of treated effluent to the HW sanitary sewer) and oil collection/storage, with the addition of increased capacity of WDG and WNDG handling/storage operations.

During the course of operations, there is also potential leaks or spills in the secondary containment areas. The proposed activities at the site can be dangerous in nature, as WDG will be handled. A

contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F). This plan includes measures for gas releases, liquid and solid releases into secondary containment and potential mixing of incompatible materials as well as emergencies (e.g., fire, explosion, etc.). These plans are supplemented with internal policies and procedures and a risk management manual/Green Book that summarizes all relevant GFL employee health and safety policies and practices. In addition, all workers handling WDG and WNDG will be trained to meet the requirements of the *NS Occupational Health and Safety Regulations*, *Transportation of Dangerous Goods* (*TDG*) and in spill response. Staff will also be trained for the handling of the WDG and in spill response in accordance with provincial and federal regulations. Signs will be placed in a high visible location identifying that waste dangerous goods are being stored at the site and the nature of the waste.

During the course of site preparation and operations, dust, exhaust emissions and noise will be generated by the heavy machinery, trucks and other operations. The current conditions are described in Sections 7.3.8 and 7.3.9.

7.4.6 Predicted Environmental Effects, Proposed Mitigation and Monitoring

As noted, there are no predicted impacts from changes to economy, land use, transportation, and tourism.

The proposed mitigation measures to protect human health to on-site workers, as well as surrounding occupants are the same as those for both Air Quality (Section 7.3.8) and Noise (Section 7.3.9). In addition, the following mitigation measures will be implemented:

- Use water and/or other approved dust suppressants to reduce and manage dust levels when required. Oil or calcium chloride will not be used for dust suppression.
- Maintain the equipment in good working condition to reduce emissions.
- Use properly sized and maintained equipment; idling of equipment and vehicles will be kept to a minimum.
- GFL will conduct particulate monitoring on an “as required” basis through high volume sampling when requested by NSECC.
- GFL will conduct noise monitoring on an “as required” basis when requested by NSECC.
- Maintain the sign indicating proponent contact information in case of concern or complaint.
- A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).
- All workers will be trained to meet the requirements of the *NS Occupational Health and Safety regulations*, TDG, spill response.
- Only certified operators may operate forklifts.
- All waste and other incompatible materials (e.g., flammables and oxidizers, acids and bases, water-reactive and aqueous solutions) will be stored in a manner that ensures they are segregated.

With the mitigation measures any impact is anticipated to be negligible.

Magnitude	Geographic Extent	Frequency	Duration	Reversibility
Negligible	Local	Daily (during operations)	Medium-term	N/A

7.5 Culture and Heritage

All areas of the Project Footprint have been disturbed in the past for Facility activities, and the soil conditions now consist of engineered fill overlying bedrock. Also, most areas of the larger Facility site have also been disturbed in the past and only a small area in the northwest corner of the site has never been previously disturbed.

Due to the fact that the entirety of the Project Footprint has been previously disturbed and original soils replaced with fill, there are no anticipated potential interactions with, or predicted effects on, archaeological or cultural resources.

8 Effects of the Project on the Mi'kmaq

Engagement has been initiated with the MFN, SFN, KMKNO, MAPC, CMM, and Nova Scotia OLA during the EA process. GFL has entered into the SGI process with the SFN to further engagement efforts. Initial information from SFN indicates that any disruption of Sipekne'katik including that of the Sipekne'katik River System will impact the health and well being of the Sipekne'katikowaq.

As stated previously, the entirety of the Project Footprint has been previously disturbed and the Project Undertaking will be adding additional capacity to an activity that already occurs at the Project Site. There are limited natural habitats present and there are no archaeological resources due to the disturbed nature of the Project Site and current operations. Surface water is being protected through operational practices, and monitoring of this resource already occurs to ensure there are no releases from the GFL facility that may affect surface water (and the adjacent watercourse).

GFL is committed to continued engagement with Mi'kmaq communities and organizations throughout the life of the Project. Should any of the Mi'kmaq communities or representatives present concerns related to the Project, GFL would be pleased to review and enhance mitigation measures if required.

At this time, no Project related adverse effects on the Mi'kmaq of Nova Scotia are anticipated.

9 Effects of The Environment on the Project

Considering the effects of the environment, including climate change and sustainability, can help prepare the Project for future changes and build climate adaptability and resiliency into the Project at the design stages. For this Project, the environment can have an impact during both the site preparation and operational phases of the project through climate change and meteorological events.

Given the spatial and temporal boundaries of the undertaking, climate change through more frequent large storm events (1:100 yr), increased severity of precipitation and wind events are anticipated to be a potential concern. There are permanent constructed features within the Project Footprint that could be subject to flooding from increased precipitation and physical damage due to high winds. Given the relative site elevations and the unrestricted downstream nature of the nearby watercourse, rising water levels in the unnamed watercourse (119m at it highest) to the northwest of the Project Footprint (124m) are unlikely to inundate portions of the Project Footprint during storm events. Although high intensity storms may cause localized flooding at the Project Site and overwhelm stormwater devices. Secondary containment measures are mostly covered (to prevent stormwater accumulation) and design of new devices will intentionally prevent stormwater accumulation where possible and consider larger rainfall events and more frequent 1:100 year storm events. The secondary containment devices

most at risk would be those surrounding the tank farms; during large storms these will be monitored to prevent overtopping (and potential release to freshwater environments) and accumulated waters sent for treatment or offsite disposal. If releases into the travel ways occur, the valve on the stormwater discharge pipe will be closed. Flow into this “closed system” will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.

Excessive precipitation (or snow) and wind events that cause damage to infrastructure may temporarily halt facility activities. However, immediate responses will be taken to clean up or repair any damage. If excessive precipitation are events forecast to occur, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered (i.e. tank farm berms) do not accumulate and overflow with precipitation. Through the use of onsite storage tanks, GFL will pump containment areas to tanks, sample and then determine course of action for the accumulated precipitation. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.

10 Effects of the Undertaking on the Environment

The current site has operated as a collection, storage and treatment facility since it was commissioned in 2005. Currently, GFL is proposing to expand the Facility in order to facilitate handling and storage of WDG and WNDG in quantities that exceed the *NSDGMR*. Activities associated with the proposed Facility expansion and operation will be conducted in accordance with Terms and Conditions of this EA, a new NSECC *Industrial Approval,* specific mitigative measures described in this assessment, and all other applicable legislation, policies, and guidelines.

Assuming the mitigative and monitoring measures specified in this report are implemented, and the facility is operated according to existing provincial guidelines and *Approvals*, no significant adverse residual environmental or socioeconomic effects are likely.

Effects are expected to be of negligible magnitude, local extent, rare to daily frequency, short to medium-term duration. Operation of the facility will result in economic benefits, including an increased option for WDG and WNDG disposal to local markets. Following the completion of facility operations, the area will be repurposed for industrial/business land use. The facility will provide a safe place for handling/storing WDG and WNDG to prevent those goods ending up in the environment.

There are no significant environmental effects expected from the proposed expansion/operation of the facility.

A summary of the potential for significant adverse effects and the required mitigative measures is provided in Table 10-1.

Table 10-1 Summary of EA Potential Effects, Mitigation and Significance

VEC	Project Activity	Potential Impact	Mitigation	Significance after Mitigation
Bio-Physical				
Surficial geology	Preparation Operations	Erosion and sedimentation Accidental Spills	– No work will be conducted outside the Project Footprint. – Implement a site-specific ESC plan in accordance with practices outlined in the latest version of the NSECC Erosion and Sedimentation Control Handbook for Construction Sites. The ESC Plan will be adjusted as required, throughout the life of the Undertaking. – Stockpiled materials (e.g., fill to be reused or new construction materials) will be stored in a manner to prevent mobilization of sediment laden surface water. – Undertake regular maintenance of any ditches and other ESC measures to minimize sediment build-up. – An emergency shut off valve and dedicated pump out control device will be installed in on the exterior stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility. – In the event of extreme precipitation, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered do not accumulate and overflow with precipitation. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F). – Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.	Negligible
Bedrock	N/A	N/A	N/A	N/A
Surface Water	Preparation	Erosion and sedimentation	– No work will be conducted outside the Project Footprint.	Negligible

VEC	Project Activity	Potential Impact	Mitigation	Significance after Mitigation
	Operations	Accidental Spills	– Follow practices outlined in the latest version of the NSECC Erosion and Sedimentation Control Handbook for Construction Sites and adjust surface water, erosion and sediment control measures accordingly if conditions change. – Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases. – An emergency shut off valve and dedicated pump out control device will be installed in on the exterior stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility. – In the event of extreme precipitation, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered do not accumulate and overflow with precipitation. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F). – Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.	
Groundwater	Preparation Operations	Accidental Spills	– No work will be conducted outside the Project Footprint. – Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).	Negligible
Wetlands	Preparation Operations	Disturbance and/or unintentional alteration Erosion and sedimentation	– No work will be conducted outside the Project Footprint. – Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change. – Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).	Negligible

VEC	Project Activity	Potential Impact	Mitigation	Significance after Mitigation
		Accidental Spills	– Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.	
Flora, Habitat and Species at Risk	Preparation Operations	Disturbance and/or vegetation removal	– No work will be conducted outside the Project Footprint. – Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change. – Secondary containment will be used in all areas where waste is delivered or handled to prevent spills or accidental releases. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).	Negligible
		Erosion and sedimentation		
		Accidental Spills		
Fauna, Habitat and Species at Risk	Preparation Operations	Disturbance of habitat	– No work will be conducted outside the Project Footprint. – Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change. – Secondary containment will be used in all areas where waste is delivered or handled to prevent spills or accidental releases. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F). – Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.	Negligible
		Disturbance of wildlife		
		Erosion and sedimentation		
		Accidental Spills		
Fish, Fish Habitat and	Preparation	Erosion and sedimentation	– No work will be conducted outside the Project Footprint.	Negligible

VEC	Project Activity	Potential Impact	Mitigation	Significance after Mitigation
Species at Risk	Operations	Accidental Spills	– Follow practices outlined in the latest version of the NSECC *Erosion and Sedimentation Control Handbook for Construction Sites* and adjust surface water, erosion and sediment control measures accordingly if conditions change. – Secondary containment devices will be used in all areas where waste is delivered or handled to prevent spills or accidental releases. – An emergency shut off valve and dedicated pump out control device will be installed in on the exterior stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this "closed system" will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility. – In the event of extreme precipitation, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered do not accumulate and overflow with precipitation. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F). – Visual inspections of the secondary containment devices for liquids will occur annually, and leak detection checks of these areas will occur every five years.	
Atmospheric Conditions/Air Quality	Preparation Operations Reclamation	Dust Generation impacting wildlife and/or human health	– Minimize the extent of disturbance for Project. – Use water and/or other approved dust suppressants to reduce and manage dust levels when required during site preparation. Oil or calcium chloride will not be used for dust suppression. – Control (GFL) vehicle speed on the transportation route to improve fuel efficiency (and reduce GHG emissions); dust is not a concern on paved roadways. – Maintain the equipment in good working condition to reduce emissions. – Use properly sized and maintained equipment; idling of equipment and vehicles will be kept to a minimum. – GFL will conduct particulate monitoring on an "as required" basis through high volume sampling when requested by NSECC. – GFL will take measures to mitigate odours "as required" by NSECC. – Maintain the current sign indicating proponent contact information in case of concern or complaint. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).	Negligible
		GHG Emissions impacting wildlife and/or human health		
		Release of dangerous gases impacting human health		

VEC	Project Activity	Potential Impact	Mitigation	Significance after Mitigation
Noise	Preparation Operations Reclamation	Noise Generation impacting wildlife and/or human health	– No work will be conducted outside the Project Footprint. – Control vehicle speed on the Project Site. – Control vehicle speed on the transportation route to reduce noise. – Maintain the equipment in good working condition. – Use properly sized and maintained equipment; idling of equipment and vehicles will be kept to a minimum. – GFL will conduct noise monitoring on an “as required” basis when requested by NSECC. – Maintain the current sign indicating proponent contact information in case of concern or complaint.	Negligible
Socio-Economic :				
Economy	Operations	N/A	N/A	N/A
Land Use	N/A	N/A	N/A	N/A
Transportation	Operations	N/A	N/A	N/A
Recreation & Tourism	N/A	N/A	N/A	N/A
Human Health	Preparation Operations Reclamation	Interaction of Project activities and Human Health	– Use water and/or other approved dust suppressants to reduce and manage dust levels when required. Oil or calcium chloride will not be used for dust suppression. – Maintain the equipment in good working condition to reduce emissions. – Use properly sized and maintained equipment; idling of equipment and vehicles will be kept to a minimum. – GFL will conduct particulate monitoring on an “as required” basis through high volume sampling when requested by NSECC. – GFL will conduct noise monitoring on an “as required” basis when requested by NSECC. – Maintain the sign indicating proponent contact information in case of concern or complaint. – A contingency and emergency response plan has been developed outlining proper handling and storing techniques, as well as what to do in the event of an accident/release (Appendix F).	Negligible

VEC	Project Activity	Potential Impact	Mitigation	Significance after Mitigation
			– All workers will be trained to meet the requirements of the *NS Occupational Health and Safety regulations*, TDG, spill response. – Only certified operators may operate forklifts. – All waste and other incompatible materials (e.g., flammables and oxidizers, acids and bases, water-reactive and aqueous solutions) will be stored in a manner that ensures they are segregated.	
Culture and Heritage	N/A	N/A	N/A	N/A

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Appendix A
Registry of Joint Stocks

ENGLOBE

NOVA SCOTIA
Registry of Joint Stock Companies

Entity Snapshot

Entity details

Information as of	22 October 2024
Registry ID	4579798
Business/Organization Name	GFL ENVIRONMENTAL SERVICES INC.
Incorporation Date	17 January 2024
Annual Return due Date	31 January 2025
Type	Extra-provincial Corporation Provincial
Status	Active
Jurisdiction	ONTARIO
Registered Office	1969 UPPER WATER ST, SUITE 1300, MCINNES COOPER TOWER, HALIFAX, NOVA SCOTIA, B3J 3R7, CANADA
Mailing Address	100 NEW PARK PLACE, SUITE 500, VAUGHAN, ONTARIO, L4K 0H9, CANADA

Directors and Officers

Name	Position
JONATHAN LUCAS PELOSI	Treasurer
MINDY GILBERT	Secretary
PATRICK DOVIGI	Director, President

Recognized Agent

Name	Position	Civic Address	Mailing Address
FAE SHAW	Recognized Agent	1969 UPPER WATER ST SUITE 1300 MCINNES COOPER TOWER HALIFAX NOVA SCOTIA B3J 3R7 CANADA	PO BOX 730 HALIFAX NOVA SCOTIA B3J 2V1 CANADA

Related Registrations

Relationship	Registry ID	Name	Status
Amalgamated From	4472691	GFL ENVIRONMENTAL SERVICES INC.	Amalgamated

Appendix B
Regulatory Information

Industrial *Approvals*

Lease

ENGLOBE

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: GFL ENVIRONMENTAL SERVICES INC.

SITE PID: 41195512

APPROVAL NO: 2015-093397-03

EXPIRY DATE: July 28, 2025

Pursuant to Part V of the Environment Act, S.N.S. 1994-95, c.1 s.1 as amended from time to time, approval is granted to the Approval Holder subject to the Terms and Conditions attached to and forming part of this Approval, for the following activity:

Industrial - Oil and Gas - Used Oil Collection Facility

Administrator: Kevin G Garroway

Effective Date: November 1, 2023

The Minister's powers and responsibilities under the Act with respect to this Approval have been delegated to the Administrator named above. Therefore, any information or notifications required to be provided to the Minister under this Approval can be provided to the Administrator unless otherwise advised in writing.

TERMS AND CONDITIONS OF APPROVAL

Nova Scotia Department of Environment and Climate Change

Approval Holder: GFL ENVIRONMENTAL SERVICES INC.

Project: Used Oil Collectors Approval

Site:

PID	Civic #	Street Name	Street Type	Community	County
41195512	203	AEROTECH	DR.	GOFFS	HALIFAX COUNTY

Approval No: 2015-093397-03

File No: 92100-30-BED-2015-093397

Reference Documents

- Application submitted October 31, 2023 and attachments.
- Original transfer application submitted September 15 and all attachments

1. Definitions

a. Act means Environment Act. 1994-95, c.1, s.1 , and includes, unless the context otherwise requires, the regulations made pursuant to the Act, as amended from time to time.

b. Administrator means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.

c. Approval means an Approval issued pursuant to this Act with respect to an activity.

d. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, Nova Scotia B4A 0C1

Phone: (902) 424-7773
Fax: (902) 424-0597

e. Extension means an increase in size, volume or other physical dimensions of an activity such that the increase may cause an adverse effect if not properly mitigated.

f. Minister means the Minister of Environment and includes any person delegated the authority of the Minister.

g. Modification means a change to an activity that may cause an adverse effect if not properly mitigated and includes, but is not limited to, the expansion of the same process, addition of product lines and replacement of equipment with different technology other than that presently in use.

h. Site means a place where a designated activity and/or undertaking is occurring or may occur.

2. Scope

a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and all documentation submitted to the Department prior to the issuance of this approval for the Used Oil Collection Facility situated at or near 203 Aero Tech Drive, Goffs, Halifax Regional Municipality .

b. The Approval Holder(s) shall ensure the designated activity is carried out in accordance with this Approval and reference documents, including the application and supporting documentation.

c. This Approval authorizes the collection and immediate conveyance of used oil or contaminated used oil as defined in the Used Oil Regulations, to another Department Approved used oil collector or to a Department Approved used oil treatment or storage facility.

d. This Approval authorizes the collection and immediate conveyance of wastewater feedstock as described in the scope of operations in the Wastewater Treatment Approval 2023-3370913-01 located on the same Site.

3. General

a. The Approval Holder(s) shall conduct the Designated Activity in accordance with the following provisions:

i. The Act, as amended from time to time;

ii. Any standard adopted by the Department, as amended from time to time, which includes but is not limited to the following:

(a) Nova Scotia Standards for Construction and Installation for Petroleum Storage Tank Systems, 1997 Edition as amended from time to time.

(b) Nova Scotia Environment Contingency Planning Guidelines, October 7, 2019 as amended from time to time.

b. Nothing in this Approval relieves the Approval Holder(s) of the responsibility for obtaining and paying for all licenses, permits, approvals or authorizations necessary for carrying out the work authorized to be performed by this Approval which may be required by municipal by-laws, provincial or federal legislation, or other organizations. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

c. No authority is granted by this Approval to enable the Approval Holder(s) to commence or continue the designated activity on lands which are not in the control or ownership of the Approval Holder(s). It is the responsibility of the Approval Holder(s) to ensure that such a contravention does not occur. The Approval Holder(s) shall provide, to the Department, proof of such control or ownership upon expiry of any relevant lease or agreement. Failure to retain said authorization may result in this Approval being cancelled or suspended.

d. If there is a discrepancy between the reference documents and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.

e. Any request for renewal or amendment of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

f. The Approval Holder(s) shall not transfer, sell, lease, assign or otherwise dispose of this Approval without the written consent of the Minister. The sale of a controlling interest of a business or a transfer of the approval from a parent company to a subsidiary or an affiliate is deemed to be a transfer requiring consent.

g. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act.

h. The Approval Holder(s) shall advise the Department in writing prior to any proposed extensions or modifications to the Activity and/or the Site. An amendment to this Approval may be required before implementing any extension or modification.

i. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

j. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

k. All sampling and analysis shall be performed in accordance with the following as amended from time to time: Standard Methods for the Examination of Water and Wastewater, or the analytical methods section of Health Canada's guideline technical document for the parameter of concern. All samples shall be collected by persons trained in appropriate sample collection procedures.

l. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analyzed by a laboratory that meets the

requirements of the Department's "Policy on Acceptable Certification of Laboratories" as amended from time to time.

m. The Approval Holder(s) shall ensure that this Approval, or a copy, is present on Site while personnel are on Site.

n. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department within five business days.

4. Air Quality

a. The Approval Holder(s) shall conduct ambient air and/or source testing in accordance with a acceptable standard, if so directed by the Department.

b. The Approval Holder(s) shall be required to mitigate adverse impacts associated with odour generation or air emissions, if so directed by the Department.

5. Noise

a. The Approval Holder(s) shall ensure that noise generated from the designated activity complies with the equivalent sound level criteria identified in the Nova Scotia Environment and Labour "Guidelines for Environmental Noise Measurement and Assessment" dated May 18, 2005, as amended from time to time.

b. The Approval Holder(s) shall monitor noise at the request of the Department. The number and location of the monitoring station(s) for noise measurement shall be established by a qualified person retained by the Approval Holder(s). The proposed plan must be deemed acceptable by the Department.

6. Surface Water

a. The Approval Holder(s) shall ensure the Site is developed and maintained to prevent contaminants from being discharged into a water resource or beyond the property boundary.

b. The Approval Holder shall be required to develop and/or implement a surface water monitoring program at the direction of the Department.

7. Groundwater Monitoring

a. The Approval Holder shall monitor and maintain the groundwater monitoring stations designated as MWB1, MW5S, MW5D, MW13 as described in drawing entitled “Site Plan Showing Monitoring Well Locations and Surface Water Locations, 2020 Semi-Annual Report”, Figure 1, October 2020, CleanEarth Technologies, by Englobe Corp.”

b. The Approval Holder shall collect groundwater samples from all groundwater monitoring stations on a quarterly frequency. Stations shall be monitored for static water level, flow direction, petroleum hydrocarbons (PHC), BTEX, PAH’s, metals for which there are CCME water quality guidelines or Nova Scotia

Environment, Environmental Quality Standards (EQS) or PSSL's, including mercury and general chemistry (ie. RCAp), including but not limited to, the parameters of conductivity, chloride, bromide and total suspended solids. (Reference Table 1)

c. The Approval holder shall collect groundwater samples from all groundwater monitoring stations annually which shall be analysed for all VOCs as identified in EPA Method 624 (purgeable organics in water).

d. Additional groundwater stations and parameters shall be monitored as directed by the Department.

8. Releases

a. Releases shall be reported in accordance with the Act.

b. Spills or releases shall be cleaned up in accordance with the Act.

9. Used Oil Storage

a. The storage of used oil and wastewater collected under this approval is limited to the following tanks, provided these tanks are not used for treatment and processing:

3 (70,000 litre) capacity steel aboveground tanks
9 (90,000 litre) capacity steel aboveground tanks
1 (60,000 litre) capacity steel double walled aboveground tank

Total capacity 1,080,000 litres

b. This Approval does not authorize de-watering (other than by gravity separation), blending, or treatment of used oil or contaminated used oil.

c. The addition of any substance to used oil or contaminated used oil shall require prior written authorization of an Administrator.

d. All tanks containing used oil shall be clearly marked or labelled to indicate that used oil is stored therein and that contents are combustible.

e. All tanks containing contaminated used oil shall be isolated though physical separation or locked valving from tanks containing used oil to prevent inadvertent transfer or mixing of contents.

10. Use and Transfer

a. Used oil collected may not be transferred, sold, or used by any person except as authorized under the Act.

b. Used oil collected shall not be used as a fuel source or otherwise burned except as authorized under the Act.

c. Equipment shall be checked daily for leakage and repaired immediately. Spill cleanup equipment shall be kept on each collection vehicle.

d. Sludge or gravity separated water from any vehicle or container must be disposed of at a facility approved by the Department. Disposal by other means shall require written authorization from the Minister.

e. All wastewater generated from the Activity shall be directed to wastewater treatment facility located on the same site in accordance with the Wastewater Treatment Approval 2023-3370913-01.

11. Contingency Plan

a. The Approval Holder shall update their contingency plan on an annual basis and make the plan available to staff of the Department upon request.

12. Reporting

a. Pursuant to Section 9(3) of the Used Oil Regulations, certificate(s) of analysis for all contaminated used oil collected shall be submitted to the Department within 7 days of their receipt.

b. Prior to April 30, the Approval Holder(s) shall submit to the Department, an annual report for the Activity.

c. The annual report should include a summarized version of the following information, as required by the terms and conditions of this approval, for each calendar year:

i. the quantity and distribution of all oil and wastewater collected in the previous year,

ii. groundwater monitoring including, but not limited to,

(a) a description of the groundwater monitoring network;

(b) current and all historical groundwater quality results including all data in tabular format, an analysis of spatial and temporal trends since monitoring began for all wells, with comparison to the References specified in Table 2, Appended to this Approval,

(c) current and historical static water elevation data in tabular format;

(d) the identification of any adverse impacts to groundwater as a result of Site activities and associated recommendations;

(e) an assessment of chloride/bromide ratios

iii. volume of used oil burned

iv. the date and description of any emergency or upset conditions,

v. any modifications to the contingency plan,

vi. any complaints received by the Approval Holder and actions taken, as required, to address the complaints.

NOVA SCOTIA

USED OIL COLLECTOR'S APPROVAL

_____	Agent for	GFL ENVIRONMENTAL SERVICES INC.
Company Agent		

hereby acknowledge that I have received a Used Oil Collector's Approval from Nova Scotia Department of Environment and Climate Change which expires July 28, 2025. My signature below certifies that I have read and agree to abide by the terms and conditions of that Approval.

Also, I hereby acknowledge that I do/do not de-water (other than by gravity separation) or otherwise treat used oil that I have collected. In the event that I do treat used oil, I understand that I must first acquire an Industrial Approval, and I am to adhere to the terms and conditions therein. I currently do/do not have an Industrial Approval issued by Nova Scotia Department of Environment and Climate Change, the Approval No. being _____ which expires_____.
Y / M / D

_____
Agent

_____
Date

Table 1: Groundwater Monitoring

Monitoring Stations	Parameters	Monitoring Frequency
MWB1, MW5S, MW5D, MW13	Static Water Level Flow Direction Petroleum Hydrocarbons PAHs Metals General Chemistry (RCAP) Including: Conductivity, total suspended solids, mercury	Quarterly
MWB1, MW5S, MW5D, MW13	Chloride and Bromide	Quarterly
MWB1, MW5S, MW5D, MW13	VOCs	Annually

Table 2: Reference Levels for Groundwater Monitoring

Monitoring Stations	Parameters	References for Groundwater 10m or less from a surface water body	References for Groundwater more than 10m from a surface water body
MWB1, MW5S, MW5D, MW13	PAHs, General Chemistry, Metals, VOCs	CCME Freshwater aquatic life guidelines	10x CCME Freshwater aquatic life guidelines
MWB1, MW5S, MW5D, MW13	Petroleum Hydrocarbons (PHC) (BTEX and TPH)	Nova Scotia Contaminated Sites Regulations tier 1 EQS for Surface Water	Nova Scotia Contaminated Sites Regulations tier 2 pathway specific standards for groundwater discharging to surface water.

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: GFL ENVIRONMENTAL SERVICES INC.

SITE PID: 41195512

APPROVAL NO: 2023-3370913-03

EXPIRY DATE: July 13, 2033

Pursuant to Part V of the Environment Act, S.N.S. 1994-95, c.1 s.1 as amended from time to time, approval is granted to the Approval Holder subject to the Terms and Conditions attached to and forming part of this Approval, for the following activity:

Industrial - Services - Wastewater Treatment Facility

Administrator: Kevin G Garroway

Effective Date: October 11, 2024

The Minister's powers and responsibilities under the Act with respect to this Approval have been delegated to the Administrator named above. Therefore, any information or notifications required to be provided to the Minister under this Approval can be provided to the Administrator unless otherwise advised in writing.

TERMS AND CONDITIONS OF APPROVAL

Nova Scotia Department of Environment and Climate Change

Approval Holder: GFL ENVIRONMENTAL SERVICES INC.

Project: 203 AEROTECH DR. - PID 41195512

Site:

PID	Civic #	Street Name	Street Type	Community	County
41195512	203	AEROTECH	DR.	GOFFS	HALIFAX COUNTY

Approval No: 2023-3370913-03

File No: 92100-30-BED-2023-3370913

Grid Reference: Easting - 456755, Northing - 4966866

Reference Documents

- Application submitted June 21, 2024 and attachments.

1. Definitions

a. Act means Environment Act. 1994-95, c.1, s.1, and includes, unless the context otherwise requires, the regulations made pursuant to the Act, as amended from time to time.

b. Associated Works means any building, machinery, equipment, device, tank, system, stockpile, or other related infrastructure.

c. Bilgewater means water that has collected in the lower part of a ship's inner hull.

d. Conceptual Site Model (CSM) means the Report "CleanEarth Technologies Inc: Conceptual Site Model, Civic No. 203 Aerotech Drive, Goffs, Nova Scotia", dated March 7, 2018, prepared by Englobe, as updated from time to time, in accordance with procedures in Chapter 4 of Volume 1 of the CCME Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME Guidance).

e. Department means the Nova Scotia Department of Environment and Climate Change, and the contact for the Department for this approval is:
Nova Scotia Department of Environment and Climate Change
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, Nova Scotia B4A 0C1

Phone: (902) 424-7773
Fax: (902) 424-0597

f. Facility means the Wastewater Treatment Facility including wastewater treatment operations, situated at 203 Aerotech Drive, Goffs, HRM.

g. Grab sample means an individual sample collected in less than thirty (30) minutes and which is representative of the substance sampled.

h. Metals refers to the list of metals identified in the “Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines","the Nova Scotia Environment Environmental Quality Standards for Surface Water and Groundwater, Revision July 6, 2013" and “Nova Scotia Environment, Guidelines For Disposal of Contaminated Solids in Landfills, May 10, 2016”, as amended from time to time.

i. Minister means the Minister of Environment and Climate Change and includes any person delegated the authority of the Minister.

j. PAH’s “polcyclic aromatic hydrocarbons” refers to the list of PAH’s identified in the “Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines”, "the Nova Scotia Environment “Environmental Quality Standards for Soil, Surface water and Groundwater, Revision July 6, 2013", and “Nova Scotia Environment, Guidelines for Disposal of Contaminated Solids in Landfills ” both, as amended from time to time.

k. Qualified Person as it relates to noise, means one who has certified post-secondary education and/or professional training in acoustics, and a minimum of 5 years of experience in the field of environmental noise, or as otherwise authorized by the Department.

l. Qualified Person as it relates to air quality, means one who has certified post-secondary education and/or professional training related to ambient (outdoor) air quality, and a minimum of 5 years of experience in the field of ambient (outdoor) air quality, or as otherwise authorized by the Department.

m. Reclamation means work performed or to be performed in accordance with an authorized plan, and includes rehabilitation of a site or facility.

n. Saltwater impacted soil or SBM means:

    i. soil, sediment or SBM material which has been excavated from below the sea level by dredging or excavation, of marine shoreline areas or marine sediments, at elevations below the elevation of the mean ordinary high water mark of sea level; or

    ii. soil, SBM or sediment which has been impacted by salt due to a release from a brine storage or salt storage facility.

o. Site means the lands where the activity will take place encompassing PID #41195512, situated at 203 Aerotech Drive, Goffs, Halifax Regional Municipality

(HRM) as referenced in WSP Canada Inc., Topographical Plan of Survey of Lot 15-A, Lands Conveyed to CleanEarth Technologies Inc. and a Portion of Block B (Portion of), Lands Conveyed to Halifax Regional Municipality, Aerotech Drive, Goffs, County of Halifax, Province of Nova Scotia, June 15, 2017.

p. Sulphide Bearing Material (SBM) means a material as defined and regulated by the Sulphide Bearing Materials Disposal Regulations.

q. Watercourse means the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.

r. Wetland means land commonly referred to as marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions.

2. Scope

a. This approval (the “Approval”) authorizes the Approval Holder to operate a wastewater treatment operation including associated works (the “Facility”) at or near 203 Aerotech Drive, Goffs, Halifax Regional Municipality (the "Site"), subject to the terms and conditions of this Approval.

b. The Approval Holder(s) shall ensure the designated activity is carried out in accordance with this Approval and reference documents, including the application and supporting documentation.

c. This Approval authorizes the following waste management practises:

   i. Storage, handling, treatment and disposal of wastewater which are impacted with petroleum hydrocarbon, PAH, suspended solids and/or metals, and associated with construction site dewatering, hydro excavation, contaminated soils and SBM.

   ii. Storage, handling and treatment of bilge water in the wastewater treatment process, subject to conditions of the Approval.

   iii. Storage, handling and treatment of oily water associated from cleaning commercial oil water separators, grease traps, and water collected from petroleum tank cleaning.

d. If authorized in writing by the administrator, other waste management practices may be temporary authorized for periods not exceeding 6 months. The administrator may require additional effluent characterization during this period of time.

e. This Approval authorizes application of the following technologies for the treatment of wastewater:

i. Bilge water pre-treatment
Dual Media Sand Filter;
Organo/clay Zeolite (oil/grease filter);
Carbon Treatment;
Ion Exchange;
Reverse Osmosis

ii. The wastewater pretreatment and the effluent treatment system and all wastewater treatment systems shall be limited to the use of the following reagents:

Anionic and Cationic Flocculants
Carbon Dioxide
Citric Acid
Corvidal 400
Ferric Chloride
Ferric Sulfate
Diatomaceous Earth
Hydrochloric Acid
Hydrogen Peroxide
Ozone
Sodium Bicarbonate
Sodium Hydroxide
Sodium Hypochlorite
Sodium Sulphide
Sulphuric Acid
Surfactants
Demulsifier
Poly-Aluminum Chloride (PAC)

The anionic and cationic reagents shall not contain, copper, selenium or cobalt as a listed ingredient in the product specifications.

f. This Approval is restricted to the Facility only. No alteration or infill of a watercourse or water resource is permitted by this Approval. Works associated with the alteration or infill of a watercourse or water resource will require separate approval from Nova Scotia Environment.

g. Solids, sediment, sludge, or soils associated with the wastewater pre-treatment process, any other water treatment process, or contaminated soils & SBM from remedial work on site shall be sent to an approved facility for disposal.

h. The Approval Holder shall remove contaminated materials from the Site upon revocation or suspension of the Approval.

i. The Approval Holder shall not conduct soil washing operations at the Facility.

j. Contaminated waste, which includes, but is not limited to, disposable coveralls, gloves, boots, and other waste materials which have been in contact with contaminated material or dangerous/waste dangerous goods, shall be collected

and stored in drums in a specified drum storage area at the Facility and disposed at an approvd facility. Materials storage shall be clearly labeled to identify waste.

3. General

a. The Approval Holder(s) shall conduct the Designated Activity in accordance with the following provisions:

i. The Act, as amended from time to time;

ii. Any standard adopted by the Department, as amended from time to time, which includes but is not limited to the following:

b. Nothing in this Approval relieves the Approval Holder(s) of the responsibility for obtaining and paying for all licenses, permits, approvals or authorizations necessary for carrying out the work authorized to be performed by this Approval which may be required by municipal by-laws, provincial or federal legislation, or other organizations. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

c. No authority is granted by this Approval to enable the Approval Holder(s) to commence or continue the designated activity on lands which are not in the control or ownership of the Approval Holder(s). It is the responsibility of the Approval Holder(s) to ensure that such a contravention does not occur. The Approval Holder(s) shall provide, to the Department, proof of such control or ownership upon expiry of any relevant lease or agreement. Failure to retain said authorization may result in this Approval being cancelled or suspended.

d. If there is a discrepancy between the reference documents and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.

e. Any request for renewal or amendment of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

f. The Approval Holder(s) shall not transfer, sell, lease, assign or otherwise dispose of this Approval without the written consent of the Minister. The sale of a controlling interest of a business or a transfer of the approval from a parent company to a subsidiary or an affiliate is deemed to be a transfer requiring consent.

g. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act.

h. The Approval Holder(s) shall notify the Department, in writing, prior to any proposed extensions or modifications to the Facility, including, but not limited to, the active area, operating area, processing changes or waste disposal practices which are not granted under this Approval. An amendment to this Approval may be required before implementing any change.

i. Extensions or modifications to the Facility may be subject to the Environmental Assessment Regulations. Written approval from the Minister may be required before implementing a change.

j. Pursuant to Section 60 of the Act, the Approval Holder(s) shall submit to the Minister any new and relevant information respecting any adverse effect that actually results, or may potentially result, from any activity to which the Approval relates and that comes to the attention of the Approval Holder(s) after the issuance of the Approval.

k. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

l. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analyzed by a laboratory that meets the requirements of the Department's "Policy on Acceptable Certification of Laboratories" as amended from time to time.

m. The Approval Holder(s) shall ensure that this Approval, or a copy, is present on Site while personnel are on Site.

n. The Approval Holder(s) shall ensure that personnel directly involved in the designated activity are made fully aware of the terms and conditions of this Approval.

o. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department within five (5) business days.

p. Electrical conductivity and sodium adsorption ratio of soils shall be sampled and analysed using the most recent procedures identified in the following document “CCME Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 4, Analytical Methods.” Sample preparation for electrical conductivity shall be conducted using not more than a 2:1 (v:w)(water to soil) ratio.

q. The failure of the Minister to insist upon a strict performance of any terms and conditions contained in this Approval shall not be deemed a waiver of any rights or remedies that the Minister may have and shall not be deemed a waiver of any subsequent breach or default in the terms and conditions contained in this Approval.

4. Liability Insurance, Financial Security and Reclamation

a. The Approval Holder shall maintain Third Party Environmental Liability Insurance of at least $ 5,000,000 to cover cleanup costs in the event of contamination or environmental upset caused by the Facility. The coverage must name the Department as an insured and the Approval Holder must ensure that the issuing agency provides written notice to the Department 30 days prior to cancellation of the policy. The policy shall remain in effect for the duration of the Approval.

b. The Approval Holder shall demonstrate that insurance coverage is in place at the request of the Department.

c. The Approval Holder shall maintain a financial security for reclamation of the Facility in a form and value acceptable to the Department and shall renew the security prior to any expiry date of the security. The Approval Holder shall ensure that any security posted is kept valid for the term of this Approval.

d. The Approval Holder shall be required to submit a revised Facility reclamation plan and/or financial reclamation security at the direction of the Department.

   i. The revised reclamation plan shall include the estimated total cost of labour, equipment, supplies and services of a third-party contractor to undertake reclamation activities associated with the Facility, including, but not limited to, the treatment and/or disposal of contaminated materials and wastewater remaining on Site. The reclamation plan shall be prepared by an independent professional engineer with experience in contaminated soil and wastewater treatment systems.

   ii. The approved reclamation plan will be used to determine a revised acceptable financial reclamation security.

e. The Department shall release the Approval Holder of their security obligations once the Facility is reclaimed in accordance with an approved reclamation plan and to the satisfaction of the Department.

5. Contaminated Materials Acceptance Criteria

a. The Approval Holder shall maintain records of all laboratory parameter concentration analyses, leachate analyses, and other records necessary to demonstrate compliance with material acceptance criteria and conditions of this Approval.

b. The Approval Holder shall submit records of analyses for wastewater accepted at the Facility at the request of the Department.

c. The Approval Holder shall not accept wastewater and/or materials which have concentrations which exceed the Health Canada Guidelines for Management of Naturally Occurring Radioactive Materials.

d. The Approval Holder shall not accept hydraulic fracturing fluids and/or back flow wastewater from oil and gas well operations.

e. The Approval Holder shall not accept drill cuttings and/or drill muds from oil and gas well operations.

f. The Approval Holder shall not accept marine and/or freshwater dredge spoils.

g. The Approval Holder shall not accept saltwater impacted soil and/or saltwater impacted SBM.

h. The Approval Holder shall not accept wastewater and/or materials contaminated with pesticides.

i. Substances classified as waste dangerous goods, as defined in the Dangerous Goods Management Regulation, or materials which are characterised as hazardous waste by the “Nova Scotia Department of Environment Guidelines For Disposal of Contaminated Solids in Landfills”, as amended from time to time, are not to be received, stored or treated at the Facility.

j. Wastewater which originates from sources which contain other contaminants such as pesticides, inorganic, halogenated or chlorinated compounds shall be analysed for these specific contaminants.

k. Minerals as defined in the Activities Designation Regulations and/or mine tailings/waste, are not to be accepted for the purposes of this Approval and are not to be received, stored or treated at the Facility.

l. Wastewater shall only be accepted at the Facility with appropriate documentation and analytical characterization.

    i. Minimum analysis shall include all parameters necessary to comply with conditions of this section, as well as inorganic, petroleum hydrocarbon, polycyclic aromatic hydrocarbons (PAH’s) parameters listed in the Department’s “Environmental Quality Standards for Soil, Surface water and Groundwater, 2022 as amended from time to time, the “Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines” as amended from time to time.

    ii. Analysis previously carried out at the source, as a result of environmental investigations, which includes the identified parameters, may be used to comply with this condition.

m. Wastewater and/or materials delivered to the Facility that do not comply with acceptance criteria shall be reported, in writing, to the Department within 48 hours.

    i. Once notification is received the wastewater and/or material shall be removed to an alternate location at the direction of the Department and in accordance with the timelines directed by the Department.

n. Only wastewater and bilgewater as authorized by Condition 2 and which originates from The Atlantic Canadian Provinces, shall be accepted, received and treated at the Facility. For the purpose of this condition, “accepted” means “having possession of or any condition resulting in the possession of wastewater and/or bilge water".

6. Dangerous Goods and Contaminated Wastewater Storage and Handling

a. The Approval Holder shall ensure that they only handle dangerous goods, waste dangerous goods, wastewater and sludge associated with the operation of the Facility.

b. All loading and unloading of dangerous goods, waste dangerous goods, wastewater and associated sludge shall be completed within the designated

handling areas of the Facility. The Approval Holder shall provide a Site layout of storage and handling areas for dangerous and waste dangerous goods at the request of the Department.

c. A trained employee of the Facility shall be present during all dangerous goods, waste dangerous goods, wastewater and associated sludge handling operations. A trained employee means the employee has acquired training in the handling of dangerous goods.

d. All dangerous goods, waste dangerous goods, wastewater and associated sludges that are handled at the Facility shall be stored in drums, vessels, containers or tanks composed of materials which are compatible with the contents stored therein.

e. Incompatible dangerous goods, waste dangerous goods, wastewater and associated sludge shall not be loaded or unloaded in the handling area at the same time.

f. All floors in the loading/unloading, processing and storage areas of the building shall be constructed of smooth impervious material with secondary containment or approved equivalent.

g. The storage and handling areas for dangerous goods, waste dangerous goods, wastewater and associated sludge of the Facility building shall have no open floor drains.

h. Sufficient aisle space shall be provided between containers/drums to allow the unobstructed movement of persons, transfer equipment, fire protection equipment, spill control equipment, and decontamination equipment to any part of the Facility.

i. All storage racks, vehicles and containers associated with flammable dangerous, waste dangerous goods, wastewater and associated sludge shall be electrically grounded to prevent build up of static electric charges if transferring flammable materials.

j. All containers, vessels, drums or tanks holding dangerous goods (eg. reagents), waste dangerous goods, wastewater and associated sludge shall be completely surrounded by secondary containment sized to contain 110% of the volume of the largest tank or container in the specifically contained area or 100% of the volume of the largest tank or container plus 10% of the aggregate capacity of all other containers or tanks in the contained area, whichever is greater.

k. Individual storage and transfer areas for wastewater shall have secondary containment to meet the specifications of condition 7(j). Areas requiring secondary containment include storage tanks, drums, vessels, transfer piping and all other containers of liquid. Secondary containment shall be constructed such that spills or discharges are not released to the environment.

l. The Approval Holder shall maintain visual and audible high level alarms to prevent overflow on all storage tanks used in pretreatment at the Facility.

m. The storage tanks shall be equipped with emergency shut-off valves to permit the immediate shutdown of transfer operations in the event of an uncontrolled release.

n. All transfers of untreated wastewater from trucks shall be conducted using containment pads or drip pans to capture spills or drips during transfer operations to/from trucks and/or piping.

o. The Approval Holder shall ensure that all storage areas and containers for dangerous /waste dangerous goods, wastewater and associated sludge are labelled, in accordance with the Dangerous Goods Management Regulations, to clearly identify their contents.

p. The Approval Holder shall maintain written standard operating procedures for the handling of dangerous/waste dangerous goods, wastewater and associated sludges which are readily available to employees. A copy of these standard operating procedures shall be made available to the Department within 48 hours of a request.

q. The Approval Holder shall ensure that legible signage is posted at the entrance to the Site that includes, but is not limited to, information pertaining to the days and hours of operation, the nature of the contaminated materials and waste stored at the Site and emergency contact numbers.

7. Air Quality

a. The Approval Holder(s) shall ensure that air emissions from the designated activity do not contribute to an exceedance of the maximum permissible ground level concentrations of contaminants specified in the Air Quality Regulations.

b. Monitoring of ambient air contaminants shall be conducted at the request of the Department. The number and location of the monitoring station(s) shall be established by a qualified person retained by the Approval Holder(s) and the proposed plan submitted to the Department for acceptance; this may include point(s) beyond the property boundary of the Site.

c. The use of oil as a dust suppressant is prohibited.

d. The Approval Holder(s) shall retain a qualified person to develop a plan to monitor ambient total suspended particulate matter at the request of the Department, in accordance with the EPA standard: EPA/625/R-96/010a, "Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Method IO-2.1 Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 Using High Volume (HV) Sampler", as amended from time to time.

    i. The plan shall be deemed acceptable by the Department and implemented upon request.

8. Noise

a. The Approval Holder(s) shall ensure that noise generated from the designated activity complies with the criteria identified in the Nova Scotia Environment and Labour "Guidelines for Environmental Noise Measurement and Assessment" dated May 18, 2005, as amended from time to time.

b. The Approval Holder(s) shall monitor noise at the request of the Department. The number and location of the monitoring station(s) for noise measurement shall be established by a qualified person retained by the Approval Holder(s). The proposed plan must be deemed acceptable by the Department.

9. Liquid Effluent

a. All pretreated wastewater, wastewater originating from remediation activities required by the Approval and wastewater originating from the Facility, including the water originating from the interceptor ditch at the property boundary, shall be directed for treatment at the liquid effluent treatment system or trucked off-site for disposal at an approved facility.

b. Daily volumetric flow of effluent to each liquid effluent discharge point shall be measured and recorded. The results of daily flow measurements shall be made available to the Department upon request within 48 hours and provided with the annual report.

c. Liquid effluent shall only be discharged to the municipal sanitary sewer system.

d. The Approval Holder shall not dilute treated or untreated liquid effluent to achieve compliance.

e. Liquid effluent which cannot be treated at the Facility, shall not be discharged, but shall be analyzed and directed to an alternate approved disposal location approved by the Department.

f. When not in use all liquid effluent discharge valves shall be locked in the closed position.

10. Odour

a. If the Department determines that the designated activity is generating excessive odours, the Approval Holder(s) shall be required to take any measures required by the Department to address those odours.

11. Surface Water

a. The Site shall be developed and maintained to prevent surface water contaminants from being discharged into a watercourse, wetland, water resource, or beyond the property boundary, in excess of the following criteria:

i)Total Suspended Solids
Clear Flows (Normal Background Conditions):

1) Maximum increase of 25 mg/l from background levels for any short term exposure (24 hour or less)

2) Maximum average increase of 5 mg/l from background levels for longer term exposure (inputs lasting between 24 hours and 30 days)

High Flow (Spring Freshets and Storm Events)
1) Maximum increase of 25 mg/l from background levels at any time when background levels are between 25 mg/l and 250 mg/l
2) Shall not increase more than 10% over background levels when background is >250 mg/l.

ii) pH (Outfall)
1) Maximum 5 to 9 in grab sample;
2) Maximum 6 to 9 as a Monthly Arithmetic Mean;

iii) Petroleum Hydrocarbons
1) Nova Scotia Environment Tier 1 Environmental Quality Standards for Surface Water - Petroleum Hydrocarbons (PHC) Parameters.

iv) Monitoring
1) The monitoring and compliance station(s) for the surface water shall be SW-2 for background and SW-1, SW-3, and SW-17 for downstream stations.

b. Erosion and sedimentation control devices shall be installed prior to construction at the Site and shall remain in place and be maintained until disturbed areas are stabilized.

c. The Department reserves the right to require modifications including, but not limited to, monitoring locations, monitoring frequency, contaminants of concern, and surface water criteria.

d. No authority is granted by this Approval to enable the Approval Holder to discharge surface water onto adjoining lands without the authorization of the affected landowner(s). It is the responsibility of the Approval Holder to ensure authorizations are current and valid.

12. Surface Water Monitoring

a. The Approval Holder shall maintain the surface water monitoring stations listed in Table 1. The surface water monitoring stations shall be located as identified in Figure A, and be monitored at the frequency and for the parameters set in Table 1.

b. The stations identified in this section as well as the raw untreated wastewater and standing water in the interceptor ditch along the property boundary, shall be monitored for the parameters and at the frequency presented in table 1.

c. The Approval Holder shall conduct additional surface water monitoring at the direction of the Department.

d. The Approval Holder shall comply with the direction of the Department, including direction to comply with the Contaminated Sites Regulations, if results of surface water analyses indicate impacts are attributable to the Facility.

e. If surface water monitoring stations are disrupted by installation of the surface water drainage collection system and/or remedial activities, the stations shall be relocated to seepage locations or upwelling groundwater locations immediately downslope of their existing locations where surface water is observed. Observation for the selection of sampling points, and sampling, shall be undertaken during both lower and high flow seasons to ensure that seasonally occurring seepage and/or upwelling is assessed, but not within 2 days after significant rainfall (10mm or more in 24 hours).

13. Groundwater Monitoring

a. The Approval Holder shall monitor and maintain the groundwater monitoring stations listed in Table 2. The groundwater monitoring Stations shall be located as shown in Figure A, and be monitored at the frequency and for the parameters set in Table 2.

b. If Petroleum Hydrocarbons are detected on site in upgradient monitoring wells, petroleum hydrocarbons shall be monitored quarterly for a minimum of 2 years at monitoring wells MW10, MW11, and MW12.

c. If PAHs are detected on site in upgradient monitoring wells, and PAHs shall be monitored quarterly for a minimum of 2 years at monitoring wells MW10, MW11, and MW12.

d. The Approval Holder shall establish, monitor and maintain any additional groundwater monitoring stations required to complete groundwater plume delineation and monitor the groundwater plume on and off-Site.

e. All new monitoring well drilling, installation, maintenance and/or decommissioning shall be overseen by a qualified professional experienced in monitoring well installation and licensed to practice in Nova Scotia by the Association of Professional Geoscientists of Nova Scotia (APGNS) or Engineers Nova Scotia.

f. The elevation of the top of well casing of all monitoring wells shall be surveyed relative to an appropriate fixed reference point at the Site.

g. No later than one month of completion of all new wells, a borehole log showing well construction shall be provided to the Department.

h. No changes shall be made to monitoring wells without prior notice to the Department.

i. The Approval Holder shall comply with any direction which may be provided by the Department about planned changes to monitoring wells.

j. If modifications are made to monitoring wells, including extensions to well casings, the well shall be re-surveyed relative to the same fixed reference point as all other wells in the monitoring well network. Survey work shall be completed prior to the next monitoring event.

k. Any new or existing well at the Facility which has been damaged or "abandoned" (i.e. is not being used or maintained for present or future use) shall be sealed in a manner acceptable to the Department and in accordance with the requirements of this Approval. Written confirmation of decommissioning shall be submitted to the Department within 30 days of completion.

l. Monitoring wells shall be decommissioned in a manner that prevents ingress of surface water to the well bore and prevents vertical migration of contaminated water within the well bore.

m. Any monitoring well which must be decommissioned due to damage or due to changes to site infrastructure, shall be replaced in accordance with the conditions of this Approval, prior to the next groundwater monitoring event. The well shall be of equivalent design, located as close as possible to the original well in a location acceptable to the Department.

n. Additional groundwater stations and parameters shall be monitored as directed by the Department.

14. Groundwater

a. The Approval Holder shall ensure that water quality in groundwater monitoring stations MW-5S, MW-5D, MW-6S, MW-6D, MW-7, MW-12, MW-13, MW-17, MW-18, MW-19 and MW-20 comply with the following limits:

i)The least stringent of the comparison of parameters for background groundwater quality (if available) and the Nova Scotia Contaminated Sites Regulations, Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water

ii)Background groundwater quality shall be based on the results of monitoring the background well required by the Department.

iii)Ambient background groundwater quality for the Site shall be determined by an experienced hydrogeologist based on statistical analysis of the results of monitoring of the background well which is completed in accordance with guidance for statistical derivation of groundwater background values from a comparable jurisdiction.

b. The Approval Holder(s) shall replace, at their expense, any water supply which has been lost or damaged as a result of the designated activity, as authorized and required by the Department.

c. The Approval Holder shall upgrade environmental control measures if groundwater monitoring indicates adverse environmental effects are attributable to activities at the Facility, at the direction of the Department. Environmental control measures shall be upgraded in a manner and time frame acceptable to the Department.

15. Releases

a. Releases shall be reported in accordance with the Act.

b. Spills or releases shall be cleaned up in accordance with the Act.

16. Contingency Plan

a. The Approval Holder(s) shall ensure that the Contingency Plan is reviewed and updated whenever equipment or products change. The Contingency Plan is to be dated to reflect the most recent update.

b. A copy of the contingency plan is to be maintained on Site at all times.

c. The Approval Holder shall maintain an up to date contingency plan to address uncontrolled discharges of untreated wastewater, dangerous goods, fires or other emergency situations. The contingency plan shall be developed and updated in accordance with the Department’s Contingency Planning Guidelines, May 10, 2016, as amended from time to time.

d. The contingency plan shall be updated at the direction of the Department and a copy made available upon request.

e. The Approval Holder shall make the local fire department aware of the Contingency Plan and typical Site inventories.

17. Reporting

a. Any non-compliance with this Approval shall be reported immediately to the Department's Regional Office. Notification shall occur,in writing, within 48 hours of the Approval Holder becoming aware of the non-compliance.

b. An annual Report shall be submitted to the Department by April 30 of each year. It shall be prepared by an experienced independent third party consultant. One paper copies and a digital version of the report shall be provided and include the following information associated with the previous calendar year activity:

i. Site drawings showing the location of monitoring stations;

ii. A summary of groundwater, surface water, sediment and effluent monitoring results including average daily flow volumes, comparison to all limits set in this Approval, and data interpretation and graphs;

iii. A list of complaints and the company response to each complaint;

iv. The quantities of untreated and treated wastewater in storage at the end ofthe calendar year;

v. The sources and quantities of all wastewater received;

vi. The destination and quantities of all soils/SBM and wastes leaving the Site;

vii. The source, quantity and destination of liquid waste which is removed from the facility which is not discharged as effluent;

viii. Average daily volume of water diverted from the drainage collection system to treatment;

c. At the same time as the annual report, a compilation of all historic data since monitoring began in a tabular format shall be provided to the department digitally and in a format acceptable to the department . A paper copy shall be provided to the department upon request. The compilation shall include include:

i. All effluent monitoring results, daily volumetric flow of effluent at each discharge point, and a comparison with the compliance limits presented in a tabular format.

ii. All surface water monitoring results since monitoring began for all stations, with comparisons to background and the Nova Scotia Contaminated Site Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water.

iii. All groundwater quality results for all wells with comparisons to background and the Nova Scotia Contaminated Site Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water.

d. At the same time as the annual report, a digital version of laboratory certificates of analysis for all monitoring data required by this approval shall be provided to the department. Paper copies of these certificates, shall be provided to the Department upon request.

e. The surface water section of the Annual Report shall include, but not be limited to, the following:

i. a review of field methodologies, including sampling techniques;

ii. a description of the surface water monitoring network;

iii. a review of the current surface water monitoring program;

iv. Monitoring data in a tabular format, with comparison and summary of exceedances to background and the Nova Scotia Contaminated Site Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water;

v. An analysis of spatial and temporal trends since monitoring began for all stations;

vi. the identification of any adverse impacts to surface water as a result of Site activities and associated recommendations;

vii. a copy of all written notifications to the Department of non-compliance with Approval limits;

viii. an assessment of chloride/bromide ratios;

ix. a covering summary statement of non-compliance with Approval limits including the date of notification of the Department of the non-compliance, and description of trends at each station for all parameters which have previously exceeded compliance limits.

f. The groundwater, and surface water sections of the annual report shall be prepared by or under the direction of an independent qualified Professional Geoscientist (APGNS) or Professional Engineer licensed to practice in the Province of Nova Scotia (ENS). The report shall be submitted in hard copy and digital format.

g. The groundwater section of the Annual Report shall include, but not be limited to, the following:

i. a review of field methodologies, including sampling techniques;

ii. a description of the groundwater monitoring network;

iii. a review of the current groundwater monitoring program;

iv. current and historical static water elevation data in tabular format;

v. groundwater gradients and flow direction presented in tabular format and in an equipotential map for each monitoring event;

vi. Monitoring data in a tabular format, with comparison and summary of exceedances to background and the Nova Scotia Contaminated Site Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water;

vii. An analysis of spatial and temporal trends since monitoring began for all wells;

viii. the identification of any adverse impacts to groundwater as a result of Site activities and associated recommendations;

ix. a copy of all written notifications to the Department of non-compliance with Approval limits;

x. an assessment of chloride/bromide ratios; and

xi. a covering summary statement of non-compliance with Approval limits including the date of notification of the Department of the non-compliance, and description of trends in each well for all parameters which have previously exceeded compliance limits.

18. Rehabilitation/Closure Plan

a. Three months prior to abandonment/closure the Approval Holder shall submit to the Department a detailed reclamation/rehabilitation/closure plan for approval.

b. The closure plan shall include the method and practices for the handling and disposal of all products and waste materials at the Facility as well as proposals to mitigate any remaining environmental impacts.

c. The rehabilitation/closure plan shall be implemented in accordance with the approved plan and/or as directed by the Department.

19. Records

a. The Approval Holder shall maintan daily records for each separate source of incoming wastewater which shall contain the following information:

i. Date and time of arrival;

ii. ii. Name and address of source;

iii. iii. History/origin of the contamination;

iv. iv. Description of the wastewater; including documentation to indicate if the material has been altered prior to or after proof of analysis;

v. v. Quantity (weight in tonnes) delivered;

vi. Name of transport company;

vii. Truck registration number;

viii. Proof of analysis, certified lab results, including test methods;

ix. Name of contact approving shipment at source;

x. List of analysis, including waste classes, contaminants and number of samples taken for characterization;

xi. Generator declaration of the accuracy of information provided.

b. Quantities of waste material entering and leaving the site;

c. The Approval Holder shall maintain a daily record of the:

- quantity of soils/SBM sent to off-Site disposal/treatment and the location;
- analytical results conducted on the soil/SBM;
- source(s) of waste water collected at the Facility;
- quantity of wastewater obtaining pre-treatment (daily, monthly, annually);
- source, quantity and destination of liquid waste which is removed from the facility,
- weekly quantity of wastewater removed from the surface water drainage collection system,
- quantity and date of liquid effluent treated and discharged to the municipal sanitary sewer (daily, monthly and annually);
- analytical results conducted on the treated effluent;
- analytical results of surface water and groundwater monitoring;
- analytical test results of any other monitoring required by conditions of

Approval;
- quantity, type and destination of waste material, including sludges, that have been shipped off-Site for final disposal, treatment or reuse;
-spills and releases.

d. The Approval Holder(s) shall ensure that all records required by this Approval are maintained for a period of five (5) years and are to be made available to the Department upon request.

20. Conceptual Site Model Updates

a. The Conceptual Site Model (CSM) shall be maintained and continually updated before and during any required site assessment and remedial activities on the Site, using all available Site investigation and monitoring results, until all results demonstrate that conditions on and off site have reached background or are consistently below Nova Scotia Environmental Quality Standards (as updated from time to time).

b. The CSM shall be maintained by an independent professional environmental engineering consultant, on the basis of all past and future investigative and monitoring work on the Site.

c. An updated CSM shall be provided to the Department upon request and prior to any application for amendment to or renewal of this Approval.

21. Water Migration at Site Boundary

a. The Approval Holder shall install additional drainage collection systems along the southwestern property boundary if so directed by the Department.

b. The Approval Holder shall intercept and redirect all water accumulating in surface water drainage collection systems and/or groundwater pump and treat systems for treatment and/or disposal in accordance with the conditions of this Approval. Water shall be removed continually from all collection systems using dedicated pumps at collection sumps such that drainage does not accumulate to prevent an uncontrolled release. The Approval Holder shall ensure that surface water drainage collection systems and/or groundwater pump and treat systems do not overtop or seep into soil or groundwater.

22. Operations Manual

a. The Approval Holder shall maintain a facility Operations Manual which includes Standard Operating Procedures which focuses on achieving environmental protection to comply with terms and conditions of Approval in all stages of operating the facility.

b. The Operations Manual shall include contingency plans to prevent and address the potential release of waste water from all piping, vessels and/ or containment systems. The procedures shall indicate how the facility will be monitored and maintained during all periods to prevent release of contaminants. It shall identify individuals responsible for implementing each procedure with backup plans

when the responsible individual is unavailable. The manual shall include, but not limited to, evenings, holidays, weekends and shutdown periods.

c. The Operations Manual shall be updated on an annual basis and a copy provided to the Department for review upon request

Table 1: Surface Water Monitoring

Monitoring Stations	Parameters	Frequency
SW1	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW2	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW3	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW4	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW5	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW6	Metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW7	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW8	Metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SW17	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
SWB1	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
INT1	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
INT2	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly
INT3	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, TDS, mercury	Quarterly

Table 2: Groundwater Monitoring

Monitoring Stations	Parameters	Monitoring Frequency
MW2	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
	VOCs (EPA Method 624)	Annually
MW4R	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW5S/MW5D	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW6S/MW6D	Metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW7	Metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW10	Metals, general chemistry (RCap), bromide, TSS, mercury*	Quarterly
MW11	Metals, general chemistry (RCap), bromide, TSS, mercury*	Quarterly
MW12	Metals, general chemistry (RCap), bromide, TSS, mercury*	Quarterly
MW13R	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
	VOCs (EPA Method 624)	Annually
MW16	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Annually

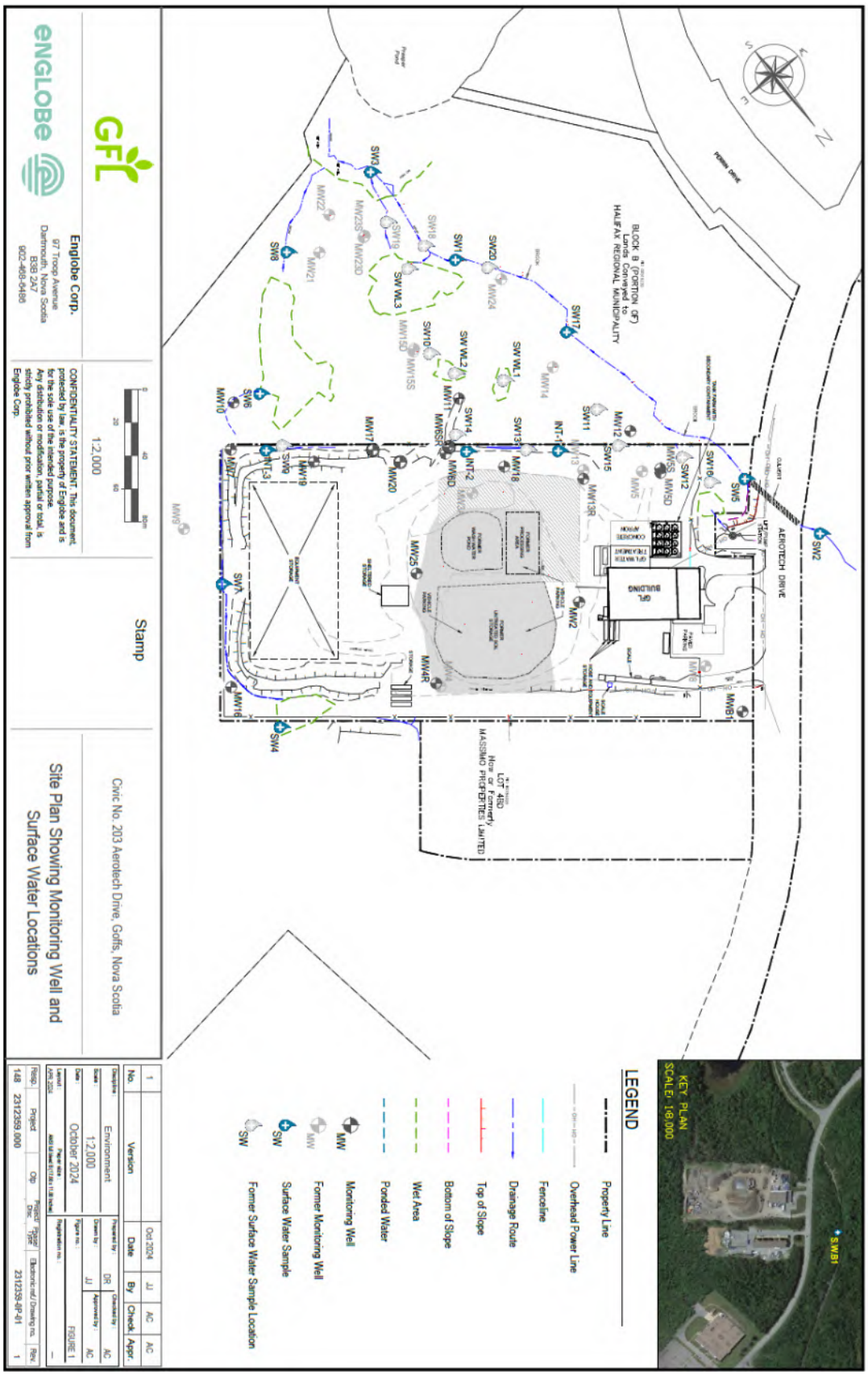
MW17	Metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW18	Metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW19	Metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW20	Metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MW25	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
MWB1	Petroleum hydrocarbons, PAHs, metals, general chemistry (RCap), bromide, TSS, mercury	Quarterly
	VOCs (EPA Method 624)	Annually

*If Petroleum Hydrocarbons and/or PAHs are detected in upgradient well(s), then these parameters must also be monitored as per the terms and conditions of this approval.

Table 3: Compliance Limits for Groundwater Monitoring

Parameter	Station	Limit
PAHs	All stations monitoring PAHs	Nova Scotia Contaminated Sites Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water
General Chemistry (RCap)	All	Nova Scotia Contaminated Sites Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water
Metals	All	Nova Scotia Contaminated Sites Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water
Petroleum Hydrocarbon (PHC)	All Stations monitoring PHC	Nova Scotia Contaminated Sites Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water
Volatile Organic Carbons (VOCs)	All groundwater stations monitoring VOCs	Nova Scotia Contaminated Sites Regulations Table 3 - Tier I Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water

Figure A: Monitoring station locations



Form 26

Purpose: to record an interest in a parcel; or
to record a power of attorney in the power of attorney roll

Registration District:	**Halifax County**
Submitter's User Number:	**17539**
Submitter's Name:	**Tyler S. James / Stewart McKelvey**

In the matter of Parcel Identification Number (PID)

PID: 41195512	

For Office Use

HALIFAX COUNTY LAND REGISTRATION OFFICE
I certify that this document was registered or recorded as shown here.
Kim MacKay, Registrar
12354558 LR ☑ ROD ☐
Document#
12 28 2023 9:49a
MM DD YYYY Time

Power of Attorney:

☐ The attached document is signed by attorney for a person under a power of attorney, and the power of attorney is:
- ☐ Recorded in the attorney roll
- ☐ Recorded in the parcel register
- ☐ Incorporated in the document

OR

☑ No power of attorney applies to this document

This form is submitted to record the attached document:

☑ In the parcel register as a recorded interest

☐ In the power of attorney roll

☐ In the power of attorney roll as a duplication of a power of attorney registered under the *Registry Act*

The following information relates to the interest being recorded:

Instrument type	Notice (All Others)
Expiry date	N/A
Interest holder and type to be added	GFL Environmental Services Inc. / Lessee
Mailing address of interest holder to be added	20 MacDonald Avenue Dartmouth, NS B3B 1C5
Name and mailing address power of attorney donor to be added	N/A
Name and mailing address power of attorney donee to be added	N/A
Reference to related instrument in names-based roll/parcel register	N/A

The textual qualifications in the above-noted parcel register(s) are to be changed as follows: **N/A**

Textual qualification on title to be removed	N/A
Textual qualification on title to be added	N/A

Certificate of Legal Effect:

I certify that, in my professional opinion, it is appropriate to make the changes to the parcel register as instructed on this form.

Dated at Halifax, in the County of Halifax and the Province of Nova Scotia, on this 27th day of December, 2023.

Signature of authorized lawyer

Name: Tyler S. James / Stewart McKelvey
Address: P.O. Box 997, Halifax, NS, B3J 2X2
Phone: 902.420.3200
E-mail: tjames@stewartmckelvey.com
Fax: 902.420.1417

☐ This document also affects non-land registration parcels. The original will be registered under the *Registry Act* and a certified true copy for recording under the *Land Registration Act* is attached.

THIS NOTICE OF LEASE AND CONFIRMATORY LEASE made as of the 1st day of November, 2023.

BETWEEN:

CLEANEARTH INDUSTRIAL SERVICES INC.

(the "**Landlord**")

OF THE FIRST PART

- and -

GFL ENVIRONMENTAL SERVICES INC.

(the "**Tenant**")

OF THE SECOND PART

WHEREAS by a certain Indenture of Lease between the Landlord and the Tenant dated as of the 1st day of November, 2023 (the "**Lease**"), the Landlord did demise and lease to the Tenant certain land more particularly described in Schedule "A" attached hereto (the "**Property**").

WITNESSETH THAT IN CONSIDERATION of the sum of One Dollar ($1.00) paid by the Tenant to the Landlord, the receipt of which is hereby acknowledged, and of other good and valuable consideration as more fully described in the Lease, the Landlord has agreed to demise and lease and hereby does demise and lease to the Tenant, and the Tenant has agreed to lease and take and does hereby lease and take (according to the terms of the Lease and governed by the limitations, restrictions and covenants contained therein), the Property, together with any and all easements, rights and appurtenances in connection therewith or thereunto belonging, as more fully set out in the Lease.

THE LEASE is for a term of five (5) years commencing on the 1st day of November, 2023 and expiring on the 31st day of October, 2028 (the "**Term** ").

THE LEASE provides further that the Tenant has the right, at its option, to extend the Term of the Lease for three (3) further periods of five (5) years each after the expiration of the Term.

THE LEASE provides further that the Tenant has the right, at its option, of first offer to purchase the Property in the event the Landlord wishes to sell, directly or indirectly, same to an arm's length third party, on such terms as are set forth in the Lease.

IT IS UNDERSTOOD that the only purpose of this Instrument is to confirm the Lease and provide notice thereof, which Lease constitutes the entire agreement between the parties.

THIS Notice of Lease and Confirmatory Lease shall enure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

[signature page follows]

IN WITNESS WHEREOF the Lessor has duly executed this Notice of Lease and Confirmatory Lease as of the day and year first above written.

Witness

Marc Reardon

CLEANEARTH INDUSTRIAL SERVICES INC.

Per: _____

Name: James Brennan

Title: President

IN WITNESS WHEREOF the Lessee has duly executed this Notice of Lease and Confirmatory Lease as of the day and year first above written.

GFL ENVIRONMENTAL SERVICES INC.

Witness: Simon Kaplan

Per: _____
Name: Mindy Gilbert
Title: Secretary

AFFIDAVIT OF STATUS

CANADA
PROVINCE OF NOVA SCOTIA

I, James Brennan, of Halifax, Province of Nova Scotia, make oath and swear that:

1. THAT I am the President of **CLEANEARTH INDUSTRIAL SERVICES INC.** (the "Corporation") and as such have a personal knowledge of the matters herein deposed to.

2. THAT I have executed the foregoing indenture on behalf of the Corporation as President, and I have authority to do so and confirm that our signatures bind the Corporation. This acknowledgment is made for the purpose of registering such Instrument pursuant to s.31(a) of the *Registry Act*, R.S.N.S. 1989, c.392 or s. 79(1)(a) of the *Land Registration Act* as the case may be.

3. THAT the Corporation is not a non-resident of Canada within the meaning of the *Income Tax Act* (Canada).

4. THAT for the purposes of this my Affidavit, "Matrimonial Home" means the dwelling and real property occupied by a person and that person's spouse as their family residence and in which either or both of them have a property interest other than a leasehold interest.

5. THAT the lands described in the indenture are not occupied by any shareholder of the Corporation as a Matrimonial Home and have never been so occupied while the lands have been owned by the Corporation; nor does the ownership of a share in the Corporation entitle the owner or owners thereof to occupy such lands as a Matrimonial Home.

SWORN TO at Halifax, Nova Scotia,
this 8th day of ~~November~~ December, 2023

Name: Marc Reardon
A Barrister of the Supreme Court of Nova Scotia

Name: James Brennan

MARC REARDON
A Barrister of the Supreme
Court of Nova Scotia

PROVINCE OF NOVA SCOTIA

I CERTIFY that on the 8th day of ~~November,~~ December YMR 2023, CleanEarth Industrial Services Inc., caused this Indenture to be properly executed by its duly authorized officer(s). I have signed as a witness to such execution.

Name: Marc Reardon
A Barrister of the Supreme Court of Nova Scotia

MARC REARDON
A Barrister of the Supreme
Court of Nova Scotia

AFFIDAVIT OF STATUS

CANADA
PROVINCE OF ONTARIO

I, Mindy Gilbert, of Toronto, Province of Ontario, make oath and swear that:

1. THAT I am the Secretary of **GFL ENVIRONMENTAL SERVICES INC.**, (the "**Corporation**") and as such have a personal knowledge of the matters herein deposed to.

2. THAT I have executed the foregoing indenture on behalf of the Corporation as Secretary and have authority to do so and confirm that my signature binds the Corporation. This acknowledgment is made for the purpose of registering such Instrument pursuant to s.31(a) of the *Registry Act*, R.S.N.S. 1989, c.392 or s. 79(1)(a) of the *Land Registration Act* as the case may be.

3. THAT the Corporation is not a non-resident of Canada within the meaning of the *Income Tax Act* (Canada).

4. THAT for the purposes of this my Affidavit, "Matrimonial Home" means the dwelling and real property occupied by a person and that person's spouse as their family residence and in which either or both of them have a property interest other than a leasehold interest.

5. THAT the lands described in the indenture are not occupied by any shareholder of the Corporation as a Matrimonial Home and have never been so occupied while the lands have been owned by the Corporation; nor does the ownership of a share in the Corporation entitle the owner or owners thereof to occupy such lands as a Matrimonial Home.

SWORN TO
before me in Toronto, Ontario, this
6th day of November, 2023

Name: Simon Kaplan
A Notary Public in the Province of Ontario

(pl seal)

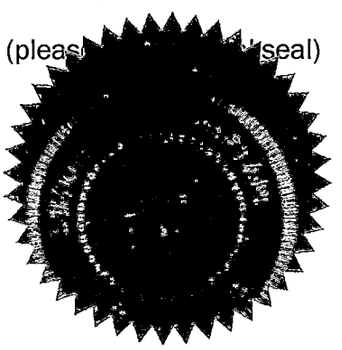
Name: Mindy Gilbert

PROVINCE OF ONTARIO

I CERTIFY that on the 6th day of November, 2023, GFL Environmental Services Inc. caused this Indenture to be properly executed by its duly authorized officer(s). I have signed as a witness to such execution.

Name: Simon Kaplan
A Notary Public for the Province of Ontario

(please affix seal)



SCHEDULE "A"

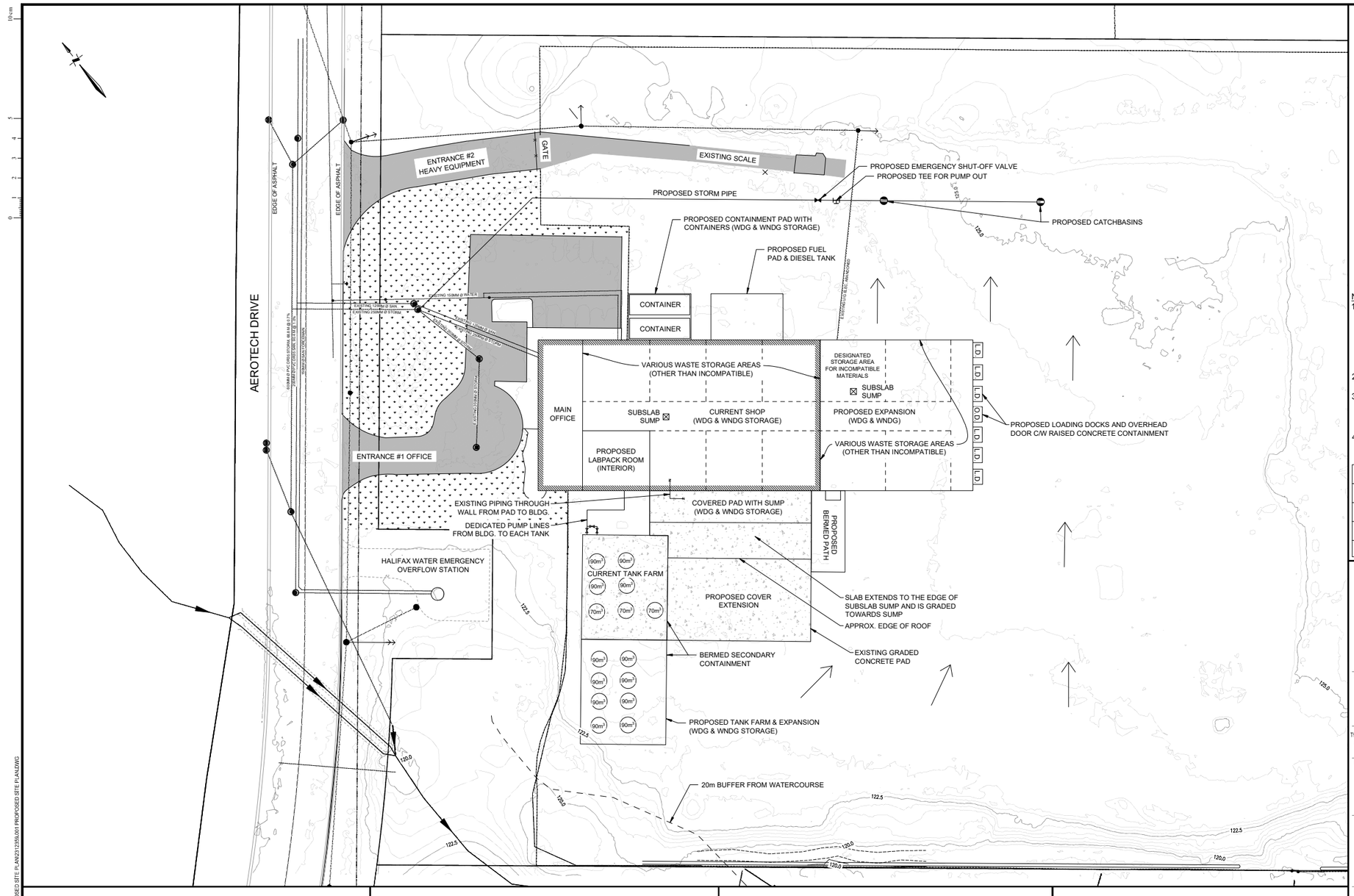
PID 41195512

Registration County: HALIFAX COUNTY
Street/Place Name: 203 AEROTECH DRIVE /GOFFS
Title of Plan: PLAN OF SURVEY OF LOT 15-A, SUBDIVISION AND CONSOLIDATION OF PARCEL A, A PORTION OF BLOCK B (REMAINDER), LANDS CONVEYED TO HALIFAX REGIONAL MUNICIPALITY AND LOT 15, LANDS CONVEYED TO GFC MANAGEMENT LIMITED
Designation of Parcel on Plan: LOT 15-A
Registration Number of Plan: 95690617
Registration Date of Plan: 2010-04-13 11:54:07

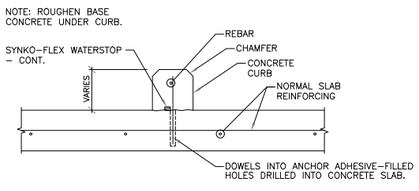
Subject to restrictive covenants more particularly described in a deed recorded as Document No. 95791548.

Appendix C
Site Plan

ENGLOBE

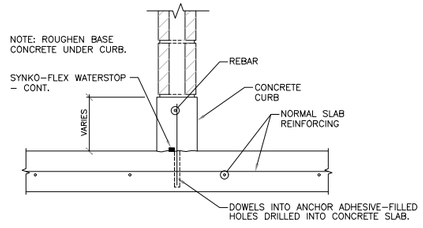


NOTE: ROUGHEN BASE CONCRETE UNDER CURB.



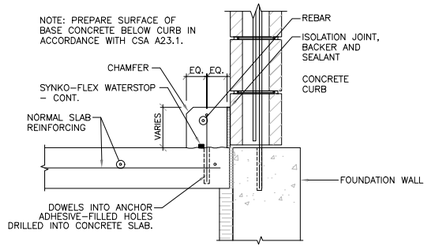
DETAIL - PROPOSED CONTAINMENT CURB

NOTE: ROUGHEN BASE CONCRETE UNDER CURB.

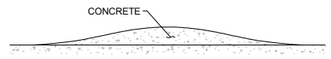


DETAIL - PROPOSED CONTAINMENT CURB WITH INTERNAL WALL

NOTE: PREPARE SURFACE OF BASE CONCRETE BELOW CURB IN ACCORDANCE WITH CSA A23.1.



DETAIL - PROPOSED CONTAINMENT CURB ADJACENT TO FOUNDATION WALL



DETAIL - RAISED CONCRETE CONTAINMENT

GFL GREEN FOR LIFE environmental

This document must be used jointly with the environmental study report

NOTES:
1. THE SECONDARY CONTAINMENT DEVICES WILL BE DESIGNED TO CONTAIN 110% OF THE VOLUME OF THE LARGEST TANK OR CONTAINER IN THE SPECIFICALLY CONTAINED AREA, OR 100% OF THE VOLUME OF THE LARGEST TANK OR CONTAINER PLUS 10% OF THE AGGREGATE CAPACITY OF ALL OTHER CONTAINERS OR TANKS IN THE CONTAINED AREA, WHICHEVER IS GREATER.
2. WASTE STORAGE AREAS ARE APPROXIMATE, EACH AREA WILL BE ENCLOSED WITH SECONDARY CONTAINMENT DEVICES.
3. SITE EXTERIOR WILL BE GRADED TOWARDS CATCHBASINS, EXACT LOCATIONS TO BE DETERMINED ONCE A SITE GRADING PLAN IS ESTABLISHED. ARROWS REPRESENT APPROXIMATE SITE GRADING.
4. ALL SUBSLAB SUMPS ARE SELF CONTAINED AND WILL BE EMPTIED MANUALLY.

No.	Version	Date	By	Check	Appr.
1.0	ISSUED FOR APPROVAL	21/10/2024	TL	LB	AC

Seal

SUBMISSION FOR APPROVAL
DATE STAMPED
NOT TO BE USED FOR CONSTRUCTION

Seal

0 2 4 6 8 10 15 20m

1:400

Client

GFL Environmental Services Inc.

Englobe Corp.
97 Troop Avenue
Dartmouth, NS B3B 2A7
T 902 468-6486
F 902 468-4919

Project

Aerotech Waste Handling Facility

203 Aerotech Drive, Goffs, Nova Scotia

Title

Proposed Site Plan & Containment Details

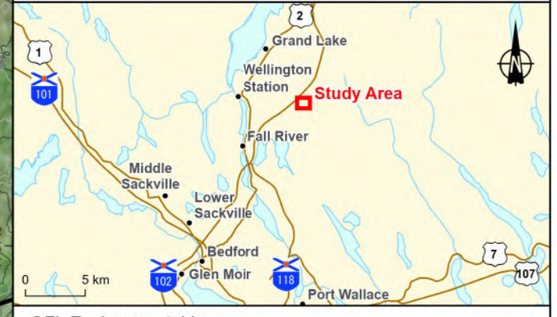
Discipline: Environment		Prepared by:		Checked by:	LB
Scale: As Noted		Drawn by:	TL	Approved by:	AC
Date: 21/10/2024		Figure N°:		01 of 01	
Page setup: A1	Paper format: ISO full bleed A1 (841.00 x 594.00 MM)	Register N°:			

Resp.	Project	Phase	Disc.	Type	Drawing N°	Rev.
	2312359.001			D	0001	1.0

G:\2023_DEL\TER\2312359_GFL\2312359.001_ENVIRONMENTAL ASSESSMENT\PROJECT\24_CAD\PROPOSED SITE PLAN\2312359.001 PROPOSED SITE PLAN.DWG

Appendix D
Regional Figure

ENGLOBE



Project Components

- Assessment Area
- Property Boundaries
- 41195512 Parcel Identifier Number (PID)
- Halifax Water Sanitary Sewer Emergency Overflow Pumping Station

Wetland

- Mapped Wetlands NS Department of Natural Resources
- Delineated Wetlands

Surficial Geology

- Beaver River Till

Contours

- 0.5m interval
- 1m interval

Hydrography

- Watercourse
- Water Body
- Drainage
- Flow Direction

Species At Risk (SAR)

- Brown-headed Cowbird
- Spotted Sandpiper
- Canada Warbler
- Wilson's Snipe
- Pine Siskin
- Peppered Moon Lichen

Infrastructures

- Local Street
- 102 Highway

GFL Environmental Inc.

Environmental Assessment

Figure 1
Regional Figure

Sources :

Base : Orthophoto, © 2014 DigitalGlobe Image courtesy of USGS
CANVec, 1/1 000 000, RNCan, 2019
CANVec, 1/50 000, RNCan, 2019
Keppie, J.D. (compiler) 2000. Geological Map of the Province of Nova Scotia; Nova Scotia Department of Natural Resources, Minerals and Energy Branch, Map ME, 2000-1, scale 1:500 000
Nova Scotia Property Records Database (NSPRD) property boundaries, Service Nova Scotia Department of Natural Resources

Mapping: Englobe, 2024

October 2024

eNGLOBE

DRAFT

Project manager: A. Cole		Date : 2024-10-18
Prepared: L. Bowser	Drawn: P. Perron	Verified: L. Bowser

Department	Project	Sub-Phase	Disc.	Type	Drawing num.	Rev.
148	2312359-001	0100	EN	C	01	0A

Fichier : P:\2023_Deltek\2312359_GFL\2312359_001_Environmental Assessment\Project\z4_CAD\GIS\2_carto\5_produit\01000\0101\version_0A\148-2312359-001-0101-EN-C-01-0A_Regional_Figure_241018.aprx

Appendix E
ACCDC Report

ENGLOBE

DATA REPORT 8163: Goffs, NS

Prepared 30 July 2024
by P. Greyson, Conservation Data Analyst

CONTENTS OF REPORT

Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (AC CDC; www.accdc.com) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The AC CDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the AC CDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees.

Upon request and for a fee, the AC CDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the AC CDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

1.1 DATA LIST

Included datasets:

Filename	Contents
GoffsNS_8163ob.xls	Rare or legally-protected Flora and Fauna in your study area
GoffsNS_8163ob100km.xls	A list of Rare and legally protected Flora and Fauna within 100 km of your study area
GoffsNS_8163msa.xls	Managed and Biologically Significant Areas in your study area

1.2 RESTRICTIONS

The AC CDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting AC CDC data, recipients assent to the following limits of use:

a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
c) The AC CDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
d) AC CDC data responses are restricted to the data in our Data System at the time of the data request.
e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
f) AC CDC data responses are not to be construed as exhaustive inventories of taxa in an area.
g) The absence of a taxon cannot be inferred by its absence in an AC CDC data response.

1.3 ADDITIONAL INFORMATION

The accompanying Data Dictionary provides metadata for the data provided.

Please direct any additional questions about AC CDC data to the following individuals:

Plants, Lichens, Ranking Methods, All other Inquiries
Sean Blaney
Senior Scientist / Executive Director
(506) 364-2658
sean.blaney@accdc.ca

Animals (Fauna)
John Klymko
Zoologist
(506) 364-2660
john.klymko@accdc.ca

Data Management, GIS
Charity Robicheau
Senior Conservation Data Analyst
charity.robicheau@accdc.ca

Billing
Jean Breau
Financial Manager / Executive Assistant
(506) 364-2657
jean.breau@accdc.ca

Questions on the biology of Federal Species at Risk can be directed to AC CDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Hubert Askanas, Energy and Resource Development: (506) 453-5873.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Donna Hurlburt, NS DLF: (902) 679-6886. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NS DLF Regional Biologist:

Western: Emma Vost
(902) 670-8187
Emma.Vost@novascotia.ca

Western: Sarah Spencer
(902) 541-0081
Sarah.Spencer@novascotia.ca

Central: Shavonne Meyer
(902) 893-0816
Shavonne.Meyer@novascotia.ca

Central: Kimberly George
(902) 890-1046
Kimberly.George@novascotia.ca

Eastern: Harrison Moore
(902) 497-4119
Harrison.Moore@novascotia.ca

Eastern: Maureen Cameron-MacMillan
(902) 295-2554
Maureen.Cameron-MacMillan@novascotia.ca

Eastern: Elizabeth Walsh
(902) 563-3370
Elizabeth.Walsh@novascotia.ca

For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

2.0 RARE AND ENDANGERED SPECIES

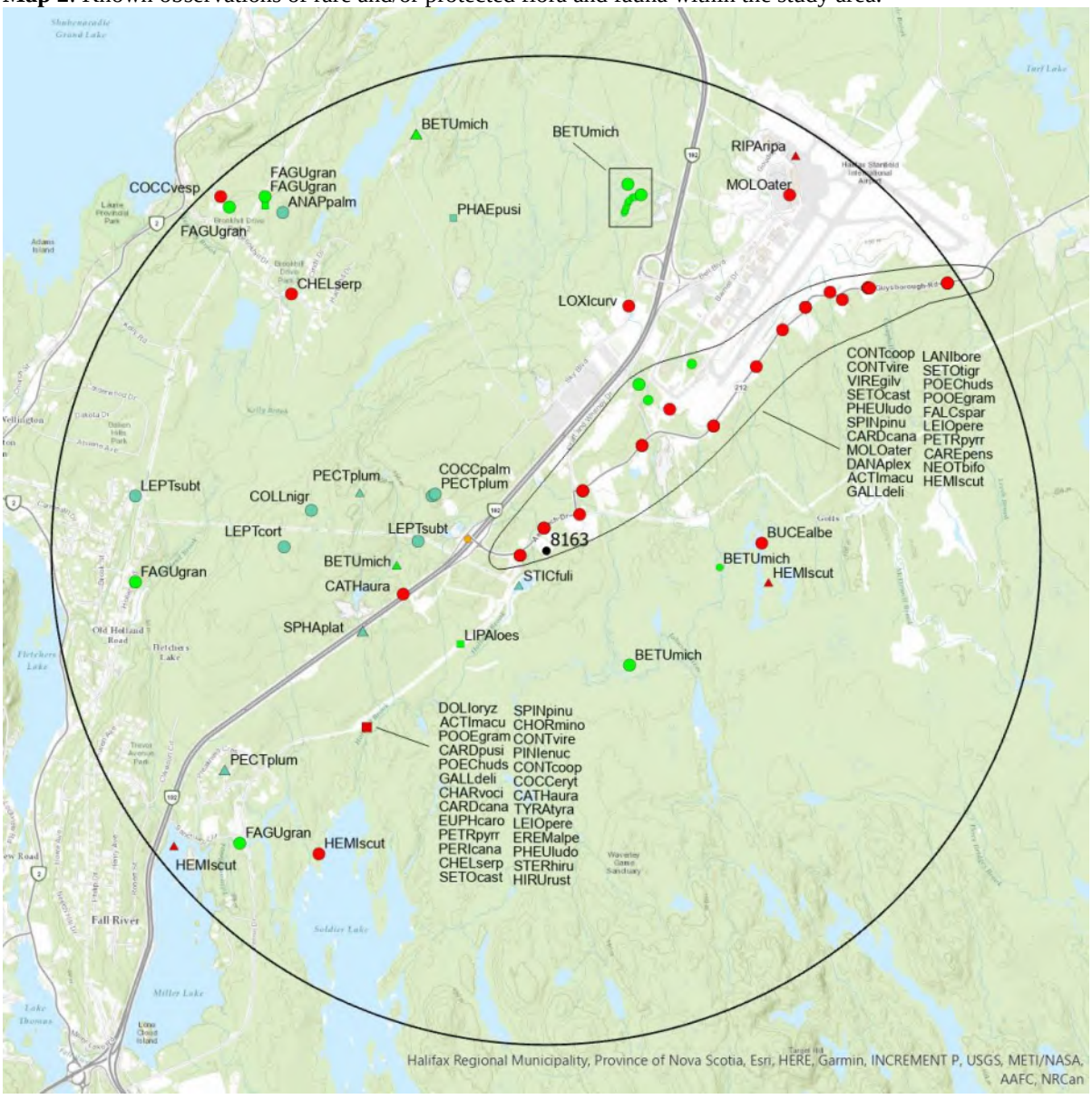
2.1 FLORA

The study area contains 24 records of 5 vascular and 13 records of 9 nonvascular flora (Map 2 and attached: *ob.xls), excluding 'location-sensitive' species.

2.2 FAUNA

The study area contains 90 records of 36 vertebrate and 1 record of 1 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List), excluding 'location-sensitive species'. Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within the study area.



Resolution

- 1.0 = Within 10s of metres
- 1.7 = Within 50s of metres
- 2.0 = Within 100s of metres
- 2.7 = Within 500s of metres
- 3.0 = Within kilometres
- 3.7 = Within 5s of kilometres
- 4.0 = Within 10s of kilometres
- 4.7 = Within 50s of kilometres

Higher taxon

- Vertebrate fauna
- Invertebrate fauna
- Vascular flora
- Nonvascular flora

3.0 SPECIAL AREAS

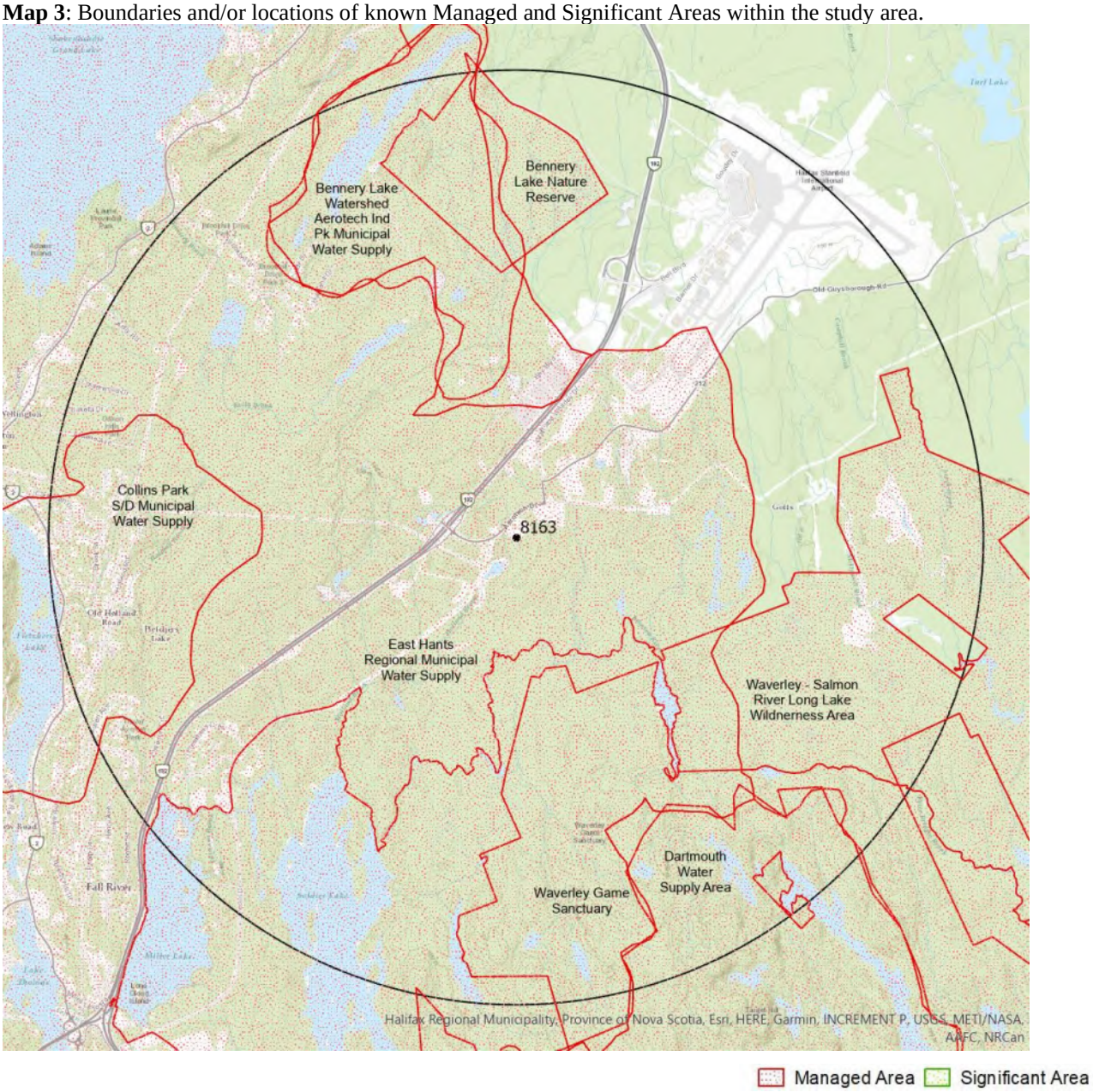
3.1 MANAGED AREAS

The GIS scan identified 11 managed areas in the vicinity of the study area (Map 3 and attached file: *msa.xls).

3.2 SIGNIFICANT AREAS

The GIS scan identified no biologically significant sites in the vicinity of the study area (Map 3).

Map 3: Boundaries and/or locations of known Managed and Significant Areas within the study area.



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding "location-sensitive" species, section 4.3) within the study area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
N	*Pectenia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	3	1.3 ± 0.2
N	*Sphagnum platyphyllum*	Flat-leaved Peat Moss				S2	2	2.0 ± 3.0
N	*Collema nigrescens*	Blistered Tarpaper Lichen				S3	1	2.4 ± 0.2
N	*Phaeophyscia pusilloides*	Pompom-tipped Shadow Lichen				S3	1	3.5 ± 7.15
N	*Sticta fuliginosa*	Peppered Moon Lichen				S3S4	1	0.4 ± 0.5
N	*Scytinium subtile*	Appressed Jellyskin Lichen				S3S4	2	1.3 ± 0.2
N	*Leptogium corticola*	Blistered Jellyskin Lichen				S3S4	1	2.6 ± 0.2
N	*Coccocarpia palmicola*	Salted Shell Lichen				S3S4	1	1.3 ± 0.2
N	*Anaptychia palmulata*	Shaggy Fringed Lichen				S3S4	1	4.3 ± 0.2
P	*Carex pensylvanica*	Pennsylvania Sedge				S1?	1	2.4 ± 0.05
P	*Betula michauxii*	Michaux's Dwarf Birch				S3	15	1.4 ± 0.1
P	*Neottia bifolia*	Southern Twayblade				S3	2	1.8 ± 0.05
P	*Fagus grandifolia*	American Beech				S3S4	5	4.2 ± 0.2
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	1	1.3 ± 5.0

4.2 FAUNA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened	Endangered	S2B	1	4.7 ± 0.5
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2	2.5 ± 7.07
A	*Chelydra serpentina*	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	4	2.5 ± 10.0
A	*Hirundo rustica*	Barn Swallow	Special Concern	Threatened	Endangered	S3B	5	2.5 ± 7.07
A	*Cardellina canadensis*	Canada Warbler	Special Concern	Threatened	Endangered	S3B	6	0.2 ± 0.25
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Special Concern	Threatened	S3B	1	2.5 ± 7.07
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Special Concern	Threatened	S3B	3	2.1 ± 0.25
A	*Dolichonyx oryzivorus*	Bobolink	Special Concern	Threatened	Vulnerable	S3B	1	2.5 ± 7.07
A	*Coccothraustes vespertinus*	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	1	4.9 ± 0.2
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	2	2.1 ± 0.25
A	*Hemidactylium scutatum*	Four-toed Salamander	Not At Risk			S3	4	1.9 ± 0.1
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B	2	2.5 ± 7.07
A	*Vireo gilvus*	Warbling Vireo				S1B,SUM	1	1.4 ± 0.25
A	*Pooecetes gramineus*	Vesper Sparrow				S1S2B,SUM	3	2.5 ± 7.07
A	*Molothrus ater*	Brown-headed Cowbird				S2B	2	0.2 ± 0.25
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B	5	2.5 ± 7.07
A	*Cathartes aura*	Turkey Vulture				S2S3B,S4S5M	2	1.5 ± 0.2
A	*Perisoreus canadensis*	Canada Jay				S3	2	2.5 ± 7.07
A	*Poecile hudsonicus*	Boreal Chickadee				S3	3	2.5 ± 7.07
A	*Spinus pinus*	Pine Siskin				S3	3	0.5 ± 0.15
A	*Charadrius vociferus*	Killdeer				S3B	2	2.5 ± 7.07
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	1	2.5 ± 7.07
A	*Tyrannus tyrannus*	Eastern Kingbird				S3B	1	2.5 ± 7.07
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	4	0.7 ± 0.25
A	*Falco sparverius*	American Kestrel				S3B,S4S5M	1	3.9 ± 0.24
A	*Gallinago delicata*	Wilson's Snipe				S3B,S5M	2	0.3 ± 0.25
A	*Cardellina pusilla*	Wilson's Warbler				S3B,S5M	1	2.5 ± 7.07

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	*Pinicola enucleator*	Pine Grosbeak				S3B,S5N,S5M	2	2.5 ± 7.07
A	*Setophaga tigrina*	Cape May Warbler				S3B,SUM	1	4.9 ± 0.25
A	*Loxia curvirostra*	Red Crossbill				S3S4	1	2.6 ± 0.2
A	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M	7	0.7 ± 0.25
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	5	0.3 ± 0.25
A	*Leiothlypis peregrina*	Tennessee Warbler				S3S4B,S5M	6	2.5 ± 7.07
A	*Bucephala albeola*	Bufflehead				S3S4N	1	2.2 ± 0.2
A	*Lanius borealis*	Northern Shrike				S3S4N	1	3.9 ± 0.2
A	*Eremophila alpestris*	Horned Lark				SHB,S4S5N,S5M	1	2.5 ± 7.07
I	*Danaus plexippus*	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	1	0.8 ± 0.01

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species "location sensitive". Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting your study area are indicated below with "YES".

Nova Scotia

Scientific *Name*	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
Alces alces americana	Moose – Mainland population		Endangered	No
Fraxinus nigra	**Black Ash**		**Threatened**	**YES**
Emydoidea blandingii	Blanding's Turtle - Nova Scotia pop.	Endangered	Endangered	No
Glyptemys insculpta	Wood Turtle	Threatened	Threatened	No
Falco peregrinus pop. 1	Peregrine Falcon - anatum/tundrius pop.		Vulnerable	No
Bat Hibernaculum or bat species occurrence		[Endangered][1]	[Endangered][1]	No
Snake hibernaculum		**[Threatened]²**	**[Threatened]²**	**YES**

1 *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NS Endangered Species Act.
2 *Thamnophis sauritus* (Eastern Ribbonsnake) is Threatened under the Federal Species at Risk Act (SARA) and the Nova Scotia Endangered Species Act. Occurrences between October 15 – April 15 are considered location sensitive.

4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the AC CDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
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11	iNaturalist. 2020. iNaturalist Data Export 2020. iNaturalist.org and iNaturalist.ca, Web site: 128728 recs.
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1	e-Butterfly. 2016. Export of Maritimes records and photos. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
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1	iNaturalist. 2018. iNaturalist Data Export 2018. iNaturalist.org and iNaturalist.ca, Web site: 11700 recs.
1	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 37164 records of 166 vertebrate and 2278 records of 76 invertebrate fauna; 9430 records of 279 vascular and 3816 records of 199 nonvascular flora (attached: *ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs (including “location-sensitive” species). All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	*Coregonus huntsmani*	Atlantic Whitefish	Endangered	Endangered	Endangered	S1	6	86.9 ± 1.0	NS
A	*Myotis lucifugus*	Little Brown Myotis	Endangered	Endangered	Endangered	S1	244	18.1 ± 0.2	NS
A	*Myotis septentrionalis*	Northern Myotis	Endangered	Endangered	Endangered	S1	20	18.1 ± 0.2	NS
A	*Perimyotis subflavus*	Tricolored Bat	Endangered	Endangered	Endangered	S1	22	18.1 ± 0.2	NS
A	*Salmo salar pop. 1*	Atlantic Salmon - Inner Bay of Fundy population	Endangered	Endangered		S1	37	10.8 ± 0.5	NS
A	*Salmo salar pop. 6*	Atlantic Salmon - Nova Scotia Southern Upland population	Endangered			S1	41	13.7 ± 0.5	NS
A	*Emydoidea blandingii pop. 1*	Blanding's Turtle - Nova Scotia population	Endangered			S1	113	90.3 ± 0.01	NS
A	*Charadrius melodus melodus*	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	510	23.3 ± 7.07	NS
A	*Sterna dougallii*	Roseate Tern	Endangered	Endangered	Endangered	S1B	62	100.0 ± 0.05	NS
A	*Dermochelys coriacea pop. 2*	Leatherback Sea Turtle - Atlantic population	Endangered	Endangered		S1S2N	3	45.4 ± 5.0	NS
A	*Morone saxatilis pop. 2*	Striped Bass - Bay of Fundy population	Endangered			S2S3B,S2S3N	4	10.8 ± 0.5	NS
A	*Melanerpes erythrocephalus*	Red-headed Woodpecker	Endangered	Threatened		SNA	2	64.4 ± 0.2	NS
A	*Protonotaria citrea*	Prothonotary Warbler	Endangered	Endangered		SNA	2	42.6 ± 0.2	NS
A	*Icteria virens*	Yellow-Breasted Chat	Endangered	Endangered		SNA	5	14.2 ± 0.2	NS
A	*Lasionycteris noctivagans*	Silver-haired Bat	Endangered			SUB,S1M	9	21.3 ± 0.2	NS
A	*Lasiurus borealis*	Eastern Red Bat	Endangered			SUB,S1M	1	75.4 ± 0.1	NS
A	*Lasiurus cinereus*	Hoary Bat	Endangered			SUB,S1M	23	14.5 ± 0.5	NS
A	*Catharus minimus minimus*	Gray-cheeked Thrush minimus subspecies	Threatened			S1?B	5	95.2 ± 0.15	NS
A	*Asio flammeus*	Short-eared Owl	Threatened	Special Concern		S1B	35	21.9 ± 7.07	NS
A	*Glyptemys insculpta*	Wood Turtle	Threatened	Threatened	Threatened	S2	973	10.0 ± 0.1	NS
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened	Endangered	S2B	1492	14.4 ± 7.07	NS
A	*Thamnophis saurita pop. 3*	Eastern Ribbonsnake - Atlantic population	Threatened	Threatened	Threatened	S2S3	9	96.6 ± 1.0	NS
A	*Chaetura pelagica*	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	1025	13.3 ± 0.15	NS
A	*Limosa haemastica*	Hudsonian Godwit	Threatened			S2S3M	75	22.7 ± 0.2	NS
A	*Acipenser oxyrinchus*	Atlantic Sturgeon	Threatened			S2S3N	12	18.8 ± 0.5	NS
A	*Hydrobates leucorhous*	Leach's Storm-Petrel	Threatened			S3B	46	19.6 ± 1.4	NS
A	*Tringa flavipes*	Lesser Yellowlegs	Threatened			S3M	777	100.0 ± 0.2	NS
A	*Anguilla rostrata*	American Eel	Threatened			S3N	137	12.2 ± 0.2	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	*Sturnella magna*	Eastern Meadowlark	Threatened	Threatened		SHB	3	16.2 ± 0.33	NS
A	*Melanerpes lewis*	Lewis's Woodpecker	Threatened	Threatened		SNA	2	39.3 ± 0.2	NS
A	*Parkesia motacilla*	Louisiana Waterthrush	Threatened	Threatened		SNA	2	45.0 ± 0.2	NS
A	*Ixobrychus exilis*	Least Bittern	Threatened	Threatened		SUB	3	25.7 ± 0.2	NS
A	*Hylocichla mustelina*	Wood Thrush	Threatened	Threatened		SUB	41	20.0 ± 7.07	NS
A	*Salmo salar pop. 12*	Atlantic Salmon - Gaspe - Southern Gulf of St. Lawrence population	Special Concern			S1	16	90.6 ± 50.0	NS
A	*Antrostomus vociferus*	Eastern Whip-Poor-Will	Special Concern	Threatened	Threatened	S1?B	12	11.9 ± 7.07	NS
A	*Passerculus sandwichensis princeps*	Ipswich Sparrow	Special Concern	Special Concern		S1B	35	26.6 ± 0.37	NS
A	*Bucephala islandica pop. 1*	Barrow's Goldeneye - Eastern Population	Special Concern	Special Concern		S1N,SUM	30	16.8 ± 0.2	NS
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	249	11.6 ± 7.07	NS
A	*Histrionicus histrionicus pop. 1*	Harlequin Duck - Eastern population	Special Concern	Special Concern	Endangered	S2N	80	25.8 ± 0.2	NS
A	*Balaenoptera physalus pop. 1*	Fin Whale - Atlantic population	Special Concern	Special Concern		S2S3	1	81.0 ± 0.49	NS
A	*Phalaropus lobatus*	Red-necked Phalarope	Special Concern	Special Concern		S2S3M	11	24.1 ± 0.5	NS
A	*Chelydra serpentina*	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	475	10.8 ± 0.2	NS
A	*Hirundo rustica*	Barn Swallow	Special Concern	Threatened	Endangered	S3B	1284	11.0 ± 0.15	NS
A	*Cardellina canadensis*	Canada Warbler	Special Concern	Threatened	Endangered	S3B	1117	0.2 ± 0.25	NS
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Special Concern	Threatened	S3B	555	100.0 ± 0.1	NS
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Special Concern	Threatened	S3B	935	100.0 ± 0.1	NS
A	*Dolichonyx oryzivorus*	Bobolink	Special Concern	Threatened	Vulnerable	S3B	753	18.3 ± 7.07	NS
A	*Coccothraustes vespertinus*	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	735	11.5 ± 0.2	NS
A	*Podiceps auritus*	Horned Grebe	Special Concern	Special Concern		S3N,SUM	33	40.6 ± 0.2	NS
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	1045	11.6 ± 0.2	NS
A	*Phocoena phocoena pop. 1*	Harbour Porpoise - Northwest Atlantic Population	Special Concern			S4	17	22.4 ± 0.2	NS
A	*Chrysemys picta*	Painted Turtle	Special Concern	Special Concern		S4	8	76.2 ± 0.02	NS
A	*Chrysemys picta picta*	Eastern Painted Turtle	Special Concern	Special Concern		S4	679	11.9 ± 10.0	NS
A	*Calidris subruficollis*	Buff-breasted Sandpiper	Special Concern	Special Concern		SNA	12	29.7 ± 0.2	NS
A	*Zonotrichia querula*	Harris's Sparrow	Special Concern			SNA	2	21.6 ± 0.2	NS
A	*Anarhichas lupus*	Atlantic Wolffish	Special Concern	Special Concern		SNR	5	30.8 ± 0.89	NS
A	*Acipenser brevirostrum*	Shortnose Sturgeon	Special Concern	Special Concern			1	67.6 ± 0.2	NS
A	*Accipiter cooperii*	Cooper's Hawk	Not At Risk			S1?B,SUN,SUM	36	14.3 ± 0.2	NS
A	*Fulica americana*	American Coot	Not At Risk			S1B	49	11.9 ± 0.98	NS
A	*Chlidonias niger*	Black Tern	Not At Risk			S1B	2	26.0 ± 0.2	NS
A	*Falco peregrinus pop. 1*	Peregrine Falcon - anatum/tundrius	Not At Risk		Vulnerable	S1B,SUM	125	19.4 ± 0.2	NS
A	*Aegolius funereus*	Boreal Owl	Not At Risk			S2?B,SUM	8	29.4 ± 7.07	NS
A	*Lynx canadensis*	Canada Lynx	Not At Risk		Endangered	S2S3	1	92.1 ± 5.0	NS
A	*Globicephala melas*	Long-finned Pilot Whale	Not At Risk			S2S3	3	25.0 ± 0.2	NS
A	*Hemidactylium scutatum*	Four-toed Salamander	Not At Risk			S3	37	1.9 ± 0.1	NS
A	*Megaptera novaeangliae*	Humpback Whale	Not At Risk			S3	2	28.5 ± 0.2	NS
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B	344	100.0 ± 0.05	NS
A	*Sialia sialis*	Eastern Bluebird	Not At Risk			S3B	77	20.0 ± 7.07	NS
A	*Buteo lagopus*	Rough-legged Hawk	Not At Risk			S3N	4	29.6 ± 0.21	NS
A	*Accipiter atricapillus*	American Goshawk	Not At Risk			S3S4	147	11.5 ± 0.2	NS
A	*Glaucomys volans*	Southern Flying Squirrel	Not At Risk			S3S4	8	40.5 ± 2.56	NS
A	*Lagenorhynchus acutus*	Atlantic White-sided Dolphin	Not At Risk			S3S4	5	36.8 ± 2.17	NS
A	*Ammospiza nelsoni*	Nelson's Sparrow	Not At Risk			S3S4B	151	20.0 ± 7.07	NS
A	*Calidris canutus rufa*	Red Knot rufa subspecies	E,SC	Endangered	Endangered	S2M	310	24.1 ± 0.5	NS
A	*Morone saxatilis*	Striped Bass	E,SC			S2S3B,S2S3N	30	25.2 ± 0.2	NS
A	*Gadus morhua*	Atlantic Cod	E,SC,DD			SNR	11	26.7 ± 0.2	NS
A	*Salmo salar*	Atlantic Salmon	E,T,SC			S1B,S1N	17	37.0 ± 0.26	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	*Alces alces americana*	Moose			Endangered	S1	75	28.1 ± 0.2	NS
A	*Sorex dispar kirklandi*	a long-tailed shrew				S1	2	70.8 ± 0.2	NS
A	*Alces alces*	Moose				S1	7	32.0 ± 0.26	NS
A	*Uria aalge*	Common Murre				S1?B	12	21.0 ± 0.2	NS
A	*Passerina cyanea*	Indigo Bunting				S1?B,SUM	31	20.9 ± 0.2	NS
A	*Oxyura jamaicensis*	Ruddy Duck				S1B	20	19.3 ± 0.2	NS
A	*Gallinula galeata*	Common Gallinule				S1B	12	17.8 ± 0.2	NS
A	*Bartramia longicauda*	Upland Sandpiper				S1B	6	19.5 ± 0.2	NS
A	*Myiarchus crinitus*	Great Crested Flycatcher				S1B	31	11.9 ± 7.07	NS
A	*Cistothorus palustris*	Marsh Wren				S1B	4	24.8 ± 0.2	NS
A	*Mimus polyglottos*	Northern Mockingbird				S1B	99	16.7 ± 7.07	NS
A	*Toxostoma rufum*	Brown Thrasher				S1B	19	21.9 ± 7.07	NS
A	*Charadrius semipalmatus*	Semipalmated Plover				S1B,S4M	1318	22.7 ± 0.2	NS
A	*Calidris minutilla*	Least Sandpiper				S1B,S4M	827	22.7 ± 0.2	NS
A	*Anas acuta*	Northern Pintail				S1B,SUM	88	13.9 ± 0.2	NS
A	*Vireo gilvus*	Warbling Vireo				S1B,SUM	31	1.4 ± 0.25	NS
A	*Vespertilionidae sp.*	bat species				S1S2	201	10.1 ± 0.1	NS
A	*Pooecetes gramineus*	Vesper Sparrow				S1S2B,SUM	49	18.3 ± 7.07	NS
A	*Vireo philadelphicus*	Philadelphia Vireo				S2?B,SUM	50	18.1 ± 0.25	NS
A	*Alca torda*	Razorbill				S2B	33	20.0 ± 0.2	NS
A	*Fratercula arctica*	Atlantic Puffin				S2B	46	49.9 ± 0.2	NS
A	*Empidonax traillii*	Willow Flycatcher				S2B	33	14.4 ± 7.07	NS
A	*Molothrus ater*	Brown-headed Cowbird				S2B	168	0.2 ± 0.25	NS
A	*Somateria mollissima*	Common Eider				S2B,S2N,S4M	1057	100.0 ± 0.05	NS
A	*Spatula clypeata*	Northern Shoveler				S2B,SUM	34	16.5 ± 0.2	NS
A	*Mareca strepera*	Gadwall				S2B,SUM	45	16.7 ± 0.2	NS
A	*Piranga olivacea*	Scarlet Tanager				S2B,SUM	48	11.9 ± 7.07	NS
A	*Calidris alba*	Sanderling				S2N,S3M	811	21.8 ± 0.63	NS
A	*Melanitta perspicillata*	Surf Scoter				S2N,S4M	76	21.0 ± 0.2	NS
A	*Melanitta deglandi*	White-winged Scoter				S2N,S4M	65	18.6 ± 0.2	NS
A	*Martes americana*	American Marten			Endangered	S2S3	2	30.7 ± 0.2	NS
A	*Asio otus*	Long-eared Owl				S2S3	27	20.3 ± 0.15	NS
A	*Rallus limicola*	Virginia Rail				S2S3B	22	28.4 ± 7.07	NS
A	*Rissa tridactyla*	Black-legged Kittiwake				S2S3B	20	49.9 ± 0.2	NS
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B	282	11.9 ± 7.07	NS
A	*Phalacrocorax carbo*	Great Cormorant				S2S3B,S2S3N	101	19.9 ± 0.2	NS
A	*Cathartes aura*	Turkey Vulture				S2S3B,S4S5M	138	1.5 ± 0.2	NS
A	*Setophaga pinus*	Pine Warbler				S2S3B,S4S5M	55	14.2 ± 0.27	NS
A	*Icterus galbula*	Baltimore Oriole				S2S3B,SUM	109	13.8 ± 0.2	NS
A	*Pluvialis dominica*	American Golden-Plover				S2S3M	133	24.1 ± 0.5	NS
A	*Numenius phaeopus hudsonicus*	Whimbrel				S2S3M	110	24.0 ± 0.2	NS
A	*Phalaropus fulicarius*	Red Phalarope				S2S3M	4	24.1 ± 0.5	NS
A	*Perisoreus canadensis*	Canada Jay				S3	597	11.6 ± 7.07	NS
A	*Poecile hudsonicus*	Boreal Chickadee				S3	642	100.0 ± 0.25	NS
A	*Spinus pinus*	Pine Siskin				S3	522	0.5 ± 0.15	NS
A	*Salvelinus fontinalis*	Brook Trout				S3	159	13.1 ± 0.5	NS
A	*Salvelinus namaycush*	Lake Trout				S3	2	19.0 ± 0.5	NS
A	*Sorex maritimensis*	Maritime Shrew				S3	1	69.0 ± 1.0	NS
A	*Synaptomys cooperi*	Southern Bog Lemming				S3	1	78.3 ± 0.5	NS
A	*Pekania pennanti*	Fisher				S3	10	26.3 ± 0.2	NS
A	*Calcarius lapponicus*	Lapland Longspur				S3?N,SUM	13	23.0 ± 0.2	NS
A	*Spatula discors*	Blue-winged Teal				S3B	90	11.9 ± 7.07	NS
A	*Charadrius vociferus*	Killdeer				S3B	563	11.6 ± 7.07	NS
A	*Tringa semipalmata*	Willet				S3B	1396	20.0 ± 7.07	NS
A	*Sterna paradisaea*	Arctic Tern				S3B	69	26.7 ± 0.15	NS
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	63	2.5 ± 7.07	NS
A	*Tyrannus tyrannus*	Eastern Kingbird				S3B	244	14.4 ± 7.07	NS

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A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	493	0.7 ± 0.25	NS
A	*Alosa pseudoharengus*	Alewife				S3B	44	14.2 ± 0.5	NS
A	*Tringa melanoleuca*	Greater Yellowlegs				S3B,S4M	1596	20.3 ± 0.2	NS
A	*Falco sparverius*	American Kestrel				S3B,S4S5M	339	11.6 ± 7.07	NS
A	*Mergus serrator*	Red-breasted Merganser				S3B,S4S5N,S5M	398	16.8 ± 0.25	NS
A	*Gallinago delicata*	Wilson's Snipe				S3B,S5M	673	0.3 ± 0.25	NS
A	*Setophaga striata*	Blackpoll Warbler				S3B,S5M	160	15.3 ± 0.2	NS
A	*Cardellina pusilla*	Wilson's Warbler				S3B,S5M	97	11.4 ± 0.2	NS
A	*Pinicola enucleator*	Pine Grosbeak				S3B,S5N,S5M	150	11.6 ± 7.07	NS
A	*Setophaga tigrina*	Cape May Warbler				S3B,SUM	194	10.5 ± 0.15	NS
A	*Branta bernicla*	Brant				S3M	4	27.5 ± 0.2	NS
A	*Pluvialis squatarola*	Black-bellied Plover				S3M	1297	22.7 ± 0.2	NS
A	*Arenaria interpres*	Ruddy Turnstone				S3M	490	24.1 ± 0.5	NS
A	*Calidris pusilla*	Semipalmated Sandpiper				S3M	1136	21.8 ± 0.63	NS
A	*Calidris melanotos*	Pectoral Sandpiper				S3M	159	22.7 ± 0.2	NS
A	*Limnodromus griseus*	Short-billed Dowitcher				S3M	894	22.9 ± 0.24	NS
A	*Chroicocephalus ridibundus*	Black-headed Gull				S3N	39	20.0 ± 0.2	NS
A	*Picoides arcticus*	Black-backed Woodpecker				S3S4	188	14.4 ± 7.07	NS
A	*Loxia curvirostra*	Red Crossbill				S3S4	257	100.0 ± 0.25	NS
A	*Botaurus lentiginosus*	American Bittern				S3S4B,S4S5M	220	11.9 ± 7.07	NS
A	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M	503	0.7 ± 0.25	NS
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	754	0.3 ± 0.25	NS
A	*Leiothlypis peregrina*	Tennessee Warbler				S3S4B,S5M	488	10.7 ± 0.25	NS
A	*Passerella iliaca*	Fox Sparrow				S3S4B,S5M	114	13.7 ± 0.25	NS
A	*Bucephala albeola*	Bufflehead				S3S4N	301	12.4 ± 0.2	NS
A	*Calidris maritima*	Purple Sandpiper				S3S4N	167	20.7 ± 0.5	NS
A	*Lanius borealis*	Northern Shrike				S3S4N	4	3.9 ± 0.2	NS
A	*Morus bassanus*	Northern Gannet				SHB	74	18.8 ± 4.78	NS
A	*Aythya americana*	Redhead				SHB	10	20.0 ± 0.2	NS
A	*Leucophaeus atricilla*	Laughing Gull				SHB	15	26.9 ± 0.54	NS
A	*Progne subis*	Purple Martin				SHB	6	26.9 ± 0.84	NS
A	*Eremophila alpestris*	Horned Lark				SHB,S4S5N,S5M	29	11.6 ± 7.07	NS
I	*Bombus bohemicus*	Ashton Cuckoo Bumble Bee	Endangered	Endangered	Endangered	S1	25	22.8 ± 5.0	NS
I	*Danaus plexippus*	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	1014	0.8 ± 0.01	NS
I	*Barnea truncata*	Atlantic Mud-piddock	Threatened	Threatened		S1	11	54.9 ± 0.2	NS
I	*Bombus suckleyi*	Suckley's Cuckoo Bumble Bee	Threatened			SH	4	31.7 ± 5.0	NS
I	*Alasmidonta varicosa*	Brook Floater	Special Concern	Special Concern	Threatened	S3	11	23.4 ± 0.1	NS
I	*Bombus terricola*	Yellow-banded Bumble Bee	Special Concern	Special Concern	Vulnerable	S3	172	17.0 ± 0.2	NS
I	*Coccinella transversoguttata richardsoni*	Transverse Lady Beetle	Special Concern		Endangered	SH	5	32.8 ± 2.5	NS
I	*Gomphurus ventricosus*	Skillet Clubtail	Special Concern	Endangered		SH	2	25.8 ± 1.0	NS
I	*Erora laeta*	Early Hairstreak				S1	1	24.7 ± 1.0	NS
I	*Pachydiplax longipennis*	Blue Dasher				S1	54	16.7 ± 0.6	NS
I	*Atlanticoncha ochracea*	Tidewater Mucket				S1	9	96.4 ± 1.0	NS
I	*Polygonia comma*	Eastern Comma				S1?	25	20.1 ± 0.2	NS
I	*Polygonia satyrus*	Satyr Comma				S1?	7	25.4 ± 1.0	NS
I	*Euphyes bimacula*	Two-spotted Skipper				S1S2	1	99.3 ± 0.1	NS
I	*Boloria chariclea grandis*	Purple Lesser Fritillary				S1S2	3	82.2 ± 2.5	NS
I	*Somatochlora brevicincta*	Quebec Emerald				S1S2	1	23.2 ± 0.1	NS
I	*Tharsalea dospassosi*	Maritime Copper				S2	3	99.6 ± 0.1	NS
I	*Satyrium acadica*	Acadian Hairstreak				S2	6	64.8 ± 2.5	NS
I	*Neurocordulia michaeli*	Broad-tailed Shadowdragon				S2	4	89.8 ± 0.05	NS
I	*Coenagrion resolutum*	Taiga Bluet				S2	2	59.2 ± 0.1	NS
I	*Margaritifera margaritifera*	Eastern Pearlshell				S2	114	100.0 ± 1.0	NS
I	*Pantala hymenaea*	Spot-Winged Glider				S2?B	7	25.1 ± 1.0	NS
I	*Nymphalis l-album j-album*	Compton Tortoiseshell				S2S3	19	23.0 ± 5.0	NS
I	*Aglais milberti*	Milbert's Tortoiseshell				S2S3	22	15.7 ± 2.0	NS

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I	*Somatochlora kennedyi*	Kennedy's Emerald				S2S3	3	25.1 ± 1.0	NS
I	*Williamsonia fletcheri*	Ebony Boghaunter				S2S3	4	97.8 ± 0.5	NS
I	*Enallagma geminatum*	Skimming Bluet				S2S3	4	29.3 ± 0.2	NS
I	*Stylurus scudderi*	Zebra Clubtail				S2S3	6	13.5 ± 1.0	NS
I	*Alasmidonta undulata*	Triangle Floater				S2S3	32	11.6 ± 0.55	NS
I	*Strophiona nitens*	Chestnut Bark Long-horned Beetle				S3	3	21.7 ± 0.2	NS
I	*Psephenus herricki*	Herrick's Water Penny Beetle				S3	8	40.6 ± 0.2	NS
I	*Platydracus fossator*	Digging Rove Beetle				S3	1	98.5 ± 0.36	NS
I	*Carabus serratus*	Serrated Ground Beetle				S3	1	62.6 ± 0.2	NS
I	*Hippodamia parenthesis*	Parenthesis Lady Beetle				S3	3	26.1 ± 0.05	NS
I	*Disonycha pensylvanica*	Pennsylvania Flea Beetle				S3	1	79.2 ± 0.2	NS
I	*Omophron americanum*	American Round Sand Beetle				S3	5	86.9 ± 0.01	NS
I	*Chrysochus auratus*	Dogbane Leaf Beetle				S3	2	85.8 ± 3.04	NS
I	*Naemia seriata*	Seaside Lady Beetle				S3	37	23.1 ± 0.54	NS
I	*Elateroides lugubris*	Sapwood Ship-timber Beetle				S3	1	26.6 ± 0.2	NS
I	*Chilocorus stigma*	Twice-stabbed Lady Beetle				S3	11	26.2 ± 0.2	NS
I	*Myzia pullata*	Streaked Lady Beetle				S3	7	17.6 ± 0.2	NS
I	*Monochamus marmorator*	Balsam Fir Sawyer				S3	3	25.2 ± 0.2	NS
I	*Dicerca tuberculata*	Swollen Jewel Beetle				S3	1	23.4 ± 9.73	NS
I	*Astylopsis sexguttata*	Six-speckled Long-horned Beetle				S3	2	7.9 ± 0.25	NS
I	*Satyrium calanus falacer*	Falacer Hairstreak				S3	73	10.8 ± 2.5	NS
I	*Callophrys lanoraieensis*	Bog Elfin				S3	28	20.5 ± 1.0	NS
I	*Strymon melinus*	Gray Hairstreak				S3	16	25.4 ± 1.0	NS
I	*Phanogomphus descriptus*	Harpoon Clubtail				S3	4	90.8 ± 0.01	NS
I	*Ophiogomphus aspersus*	Brook Snaketail				S3	6	37.8 ± 0.1	NS
I	*Ophiogomphus mainensis*	Maine Snaketail				S3	17	72.2 ± 0.2	NS
I	*Ophiogomphus rupinsulensis*	Rusty Snaketail				S3	21	23.4 ± 0.5	NS
I	*Epitheca princeps*	Prince Baskettail				S3	18	10.0 ± 0.2	NS
I	*Somatochlora forcipata*	Forcipate Emerald				S3	4	23.0 ± 1.0	NS
I	*Enallagma vernale*	Vernal Bluet				S3	6	25.8 ± 0.1	NS
I	*Strophitus undulatus*	Creeper				S3	5	99.7 ± 0.1	NS
I	*Polygonia interrogationis*	Question Mark				S3B	176	10.2 ± 0.01	NS
I	*Lepturopsis biforis*	Two-spotted Long-horned Beetle				S3S4	2	66.7 ± 0.34	NS
I	*Cecropterus pylades*	Northern Cloudywing				S3S4	8	62.7 ± 2.5	NS
I	*Amblyscirtes hegon*	Pepper and Salt Skipper				S3S4	30	10.8 ± 2.5	NS
I	*Cupido comyntas*	Eastern Tailed Blue				S3S4	29	20.8 ± 1.0	NS
I	*Argynnis aphrodite winni*	Aphrodite Fritillary				S3S4	43	25.8 ± 2.5	NS
I	*Polygonia faunus*	Green Comma				S3S4	17	10.1 ± 5.0	NS
I	*Oeneis jutta ascerta*	Jutta Arctic				S3S4	9	23.0 ± 1.0	NS
I	*Aeshna clepsydra*	Mottled Darner				S3S4	11	12.9 ± 0.1	NS
I	*Aeshna constricta*	Lance-Tipped Darner				S3S4	26	19.8 ± 1.0	NS
I	*Boyeria grafiana*	Ocellated Darner				S3S4	9	26.7 ± 0.2	NS
I	*Gomphaeschna furcillata*	Harlequin Darner				S3S4	19	10.2 ± 0.25	NS
I	*Somatochlora franklini*	Delicate Emerald				S3S4	3	25.8 ± 1.0	NS
I	*Erythrodiplax berenice*	Seaside Dragonlet				S3S4	4	22.8 ± 0.2	NS
I	*Nannothemis bella*	Elfin Skimmer				S3S4	22	12.9 ± 1.0	NS
I	*Sympetrum danae*	Black Meadowhawk				S3S4	3	56.8 ± 0.2	NS
I	*Enallagma vesperum*	Vesper Bluet				S3S4	4	20.8 ± 0.2	NS
I	*Amphiagrion saucium*	Eastern Red Damsel				S3S4	4	60.6 ± 1.0	NS
I	*Sphaerophoria pyrrhina*	Violaceous Globetail				SH	1	59.4 ± 5.0	NS
I	*Icaricia saepiolus amica*	Greenish Blue				SH	2	23.6 ± 2.5	NS
I	*Polygonia gracilis*	Hoary Comma				SH	1	61.2 ± 2.5	NS
N	*Erioderma mollissimum*	Graceful Felt Lichen	Endangered	Endangered	Endangered	S1	29	33.0 ± 0.2	NS

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N	*Erioderma pedicellatum (Atlantic pop.)*	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	426	27.9 ± 0.5	NS
N	*Peltigera hydrothyria*	Eastern Waterfan	Threatened	Threatened	Threatened	S1	182	41.4 ± 0.01	NS
N	*Pannaria lurida*	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	162	21.6 ± 13.0	NS
N	*Anzia colpodes*	Black-foam Lichen	Threatened	Threatened	Threatened	S3	40	10.9 ± 1.0	NS
N	*Fuscopannaria leucosticta*	White-rimmed Shingle Lichen	Threatened			S3	19	21.8 ± 0.01	NS
N	*Heterodermia squamulosa*	Scaly Fringe Lichen	Threatened			S3	88	46.7 ± 0.5	NS
N	*Pectenia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	280	1.3 ± 0.2	NS
N	*Sclerophora peronella (Atlantic pop.)*	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S3S4	32	10.1 ± 0.05	NS
N	*Pseudevernia cladonia*	Ghost Antler Lichen	Not At Risk			S2S3	31	29.0 ± 0.22	NS
N	*Fissidens exilis*	Pygmy Pocket Moss	Not At Risk			S3	15	33.6 ± 0.01	NS
N	*Chaenotheca servitii*	Flexuous Golden Stubble	Data Deficient			S1	1	80.9 ± 1.0	NS
N	*Aloina brevirostris*	Short-Beaked Rigid Screw Moss				S1	2	40.4 ± 2.5	NS
N	*Sematophyllum demissum*	a Moss				S1	2	6.3 ± 2.5	NS
N	*Cyrto-hypnum minutulum*	Tiny Cedar Moss				S1	1	81.0 ± 0.01	NS
N	*Blennothallia crispa*	Crinkled Jelly Lichen				S1	1	55.2 ± 0.05	NS
N	*Umbilicaria vellea*	Grizzled Rocktripe Lichen				S1	1	30.3 ± 5.0	NS
N	*Usnea perplexans*	Powdered Beard Lichen				S1	1	59.4 ± 0.4	NS
N	*Scytinium dactylinum*	Brown-buttoned Jellyskin Lichen				S1	1	88.7 ± 0.34	NS
N	*Lathagrium cristatum*	Fingered Jelly Lichen				S1	3	46.4 ± 0.05	NS
N	*Ephebe perspinulosa*	Thread Lichen				S1	1	88.7 ± 1.33	NS
N	*Fuscopannaria praetermissa*	Moss Shingles Lichen				S1	1	46.0 ± 0.05	NS
N	*Scytinium schraderi*	Wrinkled Jellyskin Lichen				S1	1	43.4 ± 0.05	NS
N	*Lichina confinis*	Marine Seaweed Lichen				S1	4	42.6 ± 0.01	NS
N	*Polychidium muscicola*	Eyed Mossthorns Woollybear Lichen				S1	1	62.0 ± 0.2	NS
N	*Pseudevernia consocians*	Common Antler Lichen				S1	1	90.1 ± 0.05	NS
N	*Sticta limbata*	Powdered Moon Lichen				S1	4	50.7 ± 3.9	NS
N	*Peltigera lepidophora*	Scaly Pelt Lichen				S1	7	44.5 ± 0.01	NS
N	*Bryoria nitidula*	Tundra Horsehair Lichen				S1	2	38.6 ± 0.6	NS
N	*Hypogymnia hultenii*	Powdered Honeycomb Lichen				S1	14	31.0 ± 1.3	NS
N	*Calypogeia neogaea*	Common Pouchwort				S1?	2	51.7 ± 0.01	NS
N	*Jubula pennsylvanica*	a liverwort				S1?	4	27.8 ± 0.2	NS
N	*Aloina rigida*	Aloe-Like Rigid Screw Moss				S1?	4	40.4 ± 2.5	NS
N	*Imbribryum muehlenbeckii*	Muehlenbeck's Bryum Moss				S1?	2	61.6 ± 0.01	NS
N	*Conardia compacta*	Coast Creeping Moss				S1?	1	49.1 ± 2.0	NS
N	*Tortula obtusifolia*	a Moss				S1?	3	57.1 ± 0.01	NS
N	*Didymodon tophaceus*	Olive Beard Moss				S1?	2	54.8 ± 4.0	NS
N	*Grimmia laevigata*	a Moss				S1?	2	19.8 ± 0.34	NS
N	*Homomallium adnatum*	Adnate Hairy-gray Moss				S1?	1	75.0 ± 0.2	NS
N	*Paludella squarrosa*	Tufted Fen Moss				S1?	3	37.7 ± 0.01	NS
N	*Physcomitrium immersum*	a Moss				S1?	4	75.7 ± 0.38	NS
N	*Schistostega pennata*	Luminous Moss				S1?	2	31.2 ± 0.01	NS
N	*Trichodon cylindricus*	Cylindric Hairy-teeth Moss				S1?	1	95.9 ± 0.2	NS
N	*Enchylium limosum*	Lime-loving Tarpaper Lichen				S1?	2	54.8 ± 4.0	NS
N	*Scytinium intermedium*	Forty-five Jellyskin Lichen				S1?	1	54.8 ± 4.0	NS
N	*Melanelia culbersonii*	Appalachain Camouflage Lichen				S1?	1	54.7 ± 0.05	NS
N	*Porella pinnata*	Pinnate Scalewort				S1S2	1	94.7 ± 0.2	NS
N	*Arrhenopterum heterostichum*	One-sided Groove Moss				S1S2	2	40.4 ± 2.5	NS
N	*Hypnum pratense*	Meadow Plait Moss				S1S2	1	89.0 ± 3.0	NS
N	*Mnium thomsonii*	Thomson's Leafy Moss				S1S2	1	46.0 ± 2.0	NS

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N	*Tortula acaulon*	Cuspidate Earth Moss				S1S2	3	81.1 ± 0.2	NS
N	*Plagiothecium latebricola*	Alder Silk Moss				S1S2	2	62.4 ± 5.0	NS
N	*Platydictya confervoides*	a Moss				S1S2	1	44.6 ± 0.01	NS
N	*Sematophyllum marylandicum*	a Moss				S1S2	2	6.3 ± 3.0	NS
N	*Timmia megapolitana*	Metropolitan Timmia Moss				S1S2	3	70.7 ± 1.6	NS
N	*Tortula mucronifolia*	Mucronate Screw Moss				S1S2	1	77.5 ± 3.0	NS
N	*Pseudotaxiphyllum distichaceum*	a Moss				S1S2	2	60.9 ± 0.01	NS
N	*Haplocladium microphyllum*	Tiny-leaved Haplocladium Moss				S1S2	1	51.8 ± 5.0	NS
N	*Rhynchostegium serrulatum*	Dark Beaked Moss				S1S2	1	46.5 ± 2.0	NS
N	*Enchylium bachmanianum*	Bachman's Jelly Lichen				S1S2	2	46.6 ± 0.05	NS
N	*Placidium squamulosum*	Limy Soil Stipplescale Lichen				S1S2	1	55.9 ± 6.0	NS
N	*Peltigera ponojensis*	Pale-bellied Pelt Lichen				S1S2	1	93.9 ± 0.5	NS
N	*Pilophorus cereolus*	Powdered Matchstick Lichen				S1S2	1	70.0 ± 3.0	NS
N	*Rhizoplaca subdiscrepans*	Scattered Rock-posy Lichen				S1S2	1	56.3 ± 1.4	NS
N	*Parmotrema reticulatum*	Netted Ruffle Lichen				S1S2	8	86.1 ± 0.01	NS
N	*Parmeliella parvula*	Poor-man's Shingles Lichen				S1S2	11	29.0 ± 0.5	NS
N	*Umbilicaria polyrhiza*	Ballpoint Rocktripe Lichen				S1S3	1	99.6 ± 0.01	NS
N	*Lecanora polytropa*	a lichen				S1S3	2	42.5 ± 1.0	NS
N	*Acarospora sinopica*	a cracked lichen				S1S3	2	23.7 ± 0.2	NS
N	*Heterodermia galactophylla*	Branching Fringe Lichen				S1S3	2	56.5 ± 0.05	NS
N	*Xylopsora friesii*	a Lichen				S1S3	2	25.6 ± 0.6	NS
N	*Stereocaulon grande*	Grand Foam Lichen				S1S3	1	73.4 ± 0.5	NS
N	*Stereocaulon intermedium*	Pacific Brain Foam Lichen				S1S3	5	21.2 ± 0.4	NS
N	*Anacamptodon splachnoides*	a Moss				S2	3	22.6 ± 30.0	NS
N	*Sphagnum platyphyllum*	Flat-leaved Peat Moss				S2	2	2.0 ± 3.0	NS
N	*Sphagnum subnitens*	Lustrous Peat Moss				S2	1	52.5 ± 2.0	NS
N	*Usnea flavocardia*	Blood-splattered Beard Lichen				S2	1	30.3 ± 4.5	NS
N	*Cystocoleus ebeneus*	Rockgossamer Lichen				S2	6	21.7 ± 0.02	NS
N	*Hypotrachyna catawbiensis*	Powder-tipped Antler Lichen				S2	11	24.5 ± 0.01	NS
N	*Scytinium imbricatum*	Scaly Jellyskin Lichen				S2	3	47.6 ± 4.0	NS
N	*Nephroma arcticum*	Arctic Kidney Lichen				S2	1	33.6 ± 1.7	NS
N	*Nephroma resupinatum*	a lichen				S2	13	16.6 ± 1.0	NS
N	*Placynthium flabellosum*	Scaly Ink Lichen				S2	2	26.0 ± 17.5	NS
N	*Moerckia flotoviana*	Flotow's Ruffwort				S2?	1	55.4 ± 0.01	NS
N	*Riccardia multifida*	Delicate Germanderwort				S2?	3	26.7 ± 0.2	NS
N	*Anomodon viticulosus*	a Moss				S2?	2	86.3 ± 0.2	NS
N	*Weissia muhlenbergiana*	a Moss				S2?	5	46.0 ± 1.2	NS
N	*Atrichum angustatum*	Lesser Smoothcap Moss				S2?	3	26.7 ± 0.53	NS
N	*Ptychostomum pendulum*	Drooping Bryum				S2?	1	40.4 ± 2.5	NS
N	*Drepanocladus polygamus*	Polygamous Hook Moss				S2?	4	49.5 ± 2.0	NS
N	*Pseudocampylium radicale*	Long-stalked Fine Wet Moss				S2?	1	89.0 ± 3.0	NS
N	*Dicranum condensatum*	Condensed Broom Moss				S2?	3	43.3 ± 0.01	NS
N	*Ditrichum rhynchostegium*	a Moss				S2?	1	21.2 ± 1.4	NS
N	*Grimmia anomala*	Mountain Forest Grimmia				S2?	1	71.5 ± 1.5	NS
N	*Kiaeria starkei*	Starke's Fork Moss				S2?	1	38.6 ± 10.0	NS
N	*Orthotrichum anomalum*	Anomalous Bristle Moss				S2?	1	49.5 ± 2.0	NS
N	*Philonotis marchica*	a Moss				S2?	2	67.6 ± 0.01	NS
N	*Platydictya jungermannioides*	False Willow Moss				S2?	1	25.3 ± 0.01	NS
N	*Saelania glaucescens*	Blue Dew Moss				S2?	1	90.0 ± 0.1	NS
N	*Cyrtomnium hymenophylloides*	Short-pointed Lantern Moss				S2?	2	20.3 ± 5.0	NS
N	*Platylomella lescurii*	a Moss				S2?	9	28.0 ± 0.01	NS

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N	*Phylliscum demangeonii*	Black Rock-wafer Lichen				S2?	5	100.0 ± 0.05	NS
N	*Oxyrrhynchium hians*	Light Beaked Moss				S2S3	4	32.4 ± 25.0	NS
N	*Platydictya subtilis*	Bark Willow Moss				S2S3	1	80.3 ± 3.2	NS
N	*Scorpidium revolvens*	Limprichtia Moss				S2S3	3	37.7 ± 0.01	NS
N	*Moelleropsis nebulosa*	Blue-gray Moss Shingle Lichen				S2S3	59	16.5 ± 1.2	NS
N	*Moelleropsis nebulosa ssp. frullaniae*	Blue-gray Moss Shingle Lichen				S2S3	2	40.9 ± 0.5	NS
N	*Ramalina thrausta*	Angelhair Ramalina Lichen				S2S3	12	22.8 ± 5.0	NS
N	*Collema leptaleum*	Crumpled Bat's Wing Lichen				S2S3	94	24.4 ± 0.2	NS
N	*Usnea ceratina*	Warty Beard Lichen				S2S3	2	72.1 ± 0.4	NS
N	*Usnea hirta*	Bristly Beard Lichen				S2S3	3	15.9 ± 5.32	NS
N	*Usnea rubicunda*	Red Beard Lichen				S2S3	5	50.7 ± 0.24	NS
N	*Ahtiana aurescens*	Eastern Candlewax Lichen				S2S3	18	18.1 ± 0.7	NS
N	*Usnocetraria oakesiana*	Yellow Band Lichen				S2S3	12	17.6 ± 0.5	NS
N	*Cetraria muricata*	Spiny Heath Lichen				S2S3	1	23.4 ± 0.01	NS
N	*Cladonia incrassata*	Powder-foot British Soldiers Lichen				S2S3	1	34.9 ± 0.2	NS
N	*Cladonia mateocyatha*	Mixed-up Pixie-cup				S2S3	5	22.5 ± 5.5	NS
N	*Cladonia parasitica*	Fence-rail Lichen				S2S3	3	16.8 ± 0.24	NS
N	*Scytinium tenuissimum*	Birdnest Jellyskin Lichen				S2S3	10	21.9 ± 0.01	NS
N	*Melanohalea septentrionalis*	Northern Camouflage Lichen				S2S3	1	59.3 ± 0.6	NS
N	*Myelochroa aurulenta*	Powdery Axil-bristle Lichen				S2S3	3	70.9 ± 2.3	NS
N	*Parmelia fertilis*	Fertile Shield Lichen				S2S3	11	59.0 ± 0.6	NS
N	*Hypotrachyna minarum*	Hairless-spined Shield Lichen				S2S3	3	40.5 ± 0.05	NS
N	*Parmeliopsis ambigua*	Green Starburst Lichen				S2S3	2	25.2 ± 0.6	NS
N	*Racodium rupestre*	Rockhair Lichen				S2S3	3	16.5 ± 1.2	NS
N	*Umbilicaria polyphylla*	Petalled Rocktripe Lichen				S2S3	2	43.1 ± 0.2	NS
N	*Usnea cavernosa*	Pitted Beard Lichen				S2S3	4	59.4 ± 0.4	NS
N	*Usnea mutabilis*	Bloody Beard Lichen				S2S3	1	59.4 ± 0.25	NS
N	*Fuscopannaria sorediata*	a Lichen				S2S3	6	16.5 ± 1.2	NS
N	*Stereocaulon condensatum*	Granular Soil Foam Lichen				S2S3	5	24.7 ± 0.01	NS
N	*Physcia subtilis*	Slender Rosette Lichen				S2S3	2	31.6 ± 0.05	NS
N	*Dimelaena oreina*	Golden Moonglow Lichen				S2S3	2	30.8 ± 0.62	NS
N	*Hypotrachyna revoluta*	Granulating Loop Lichen				S2S3	1	81.4 ± 0.2	NS
N	*Cetraria arenaria*	Sand-loving Icelandmoss Lichen				S2S3	13	76.0 ± 0.4	NS
N	*Cladonia coccifera*	Eastern Boreal Pixie-cup Lichen				S2S3	3	16.8 ± 4.0	NS
N	*Cladonia deformis*	Lesser Sulphur-cup Lichen				S2S3	3	57.8 ± 4.0	NS
N	*Cladonia phyllophora*	Felt Lichen				S2S3	2	83.8 ± 4.5	NS
N	*Usnea flammea*	Coastal Bushy Beard Lichen				S2S3	1	42.5 ± 1.0	NS
N	*Ephemerum serratum*	a Moss				S3	5	48.3 ± 5.0	NS
N	*Fissidens taxifolius*	Yew-leaved Pocket Moss				S3	15	22.7 ± 0.2	NS
N	*Anomodon tristis*	a Moss				S3	10	47.9 ± 15.0	NS
N	*Sphagnum contortum*	Twisted Peat Moss				S3	4	51.5 ± 4.0	NS
N	*Tetraplodon angustatus*	Toothed-leaved Nitrogen Moss				S3	3	52.5 ± 2.0	NS
N	*Rostania occultata*	Crusted Tarpaper Lichen				S3	2	90.5 ± 0.2	NS
N	*Collema nigrescens*	Blistered Tarpaper Lichen				S3	40	2.4 ± 0.2	NS
N	*Solorina saccata*	Woodland Owl Lichen				S3	11	24.8 ± 2.0	NS
N	*Fuscopannaria ahlneri*	Roughened Shingle Lichen				S3	84	16.2 ± 0.5	NS
N	*Scytinium lichenoides*	Tattered Jellyskin Lichen				S3	32	27.0 ± 0.6	NS
N	*Leptogium milligranum*	Stretched Jellyskin Lichen				S3	12	37.3 ± 0.2	NS
N	*Nephroma bellum*	Naked Kidney Lichen				S3	8	18.1 ± 0.5	NS
N	*Placynthium nigrum*	Common Ink Lichen				S3	2	57.1 ± 0.05	NS
N	*Platismatia norvegica*	Oldgrowth Rag Lichen				S3	1	55.0 ± 0.7	NS

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N	*Punctelia appalachensis*	Appalachian Speckleback Lichen				S3	114	77.4 ± 0.01	NS
N	*Viridothelium virens*	a lichen				S3	4	21.6 ± 2.0	NS
N	*Ephebe lanata*	Waterside Rockshag Lichen				S3	4	26.0 ± 17.5	NS
N	*Phaeophyscia adiastola*	Powder-tipped Shadow Lichen				S3	1	23.6 ± 0.2	NS
N	*Phaeophyscia pusilloides*	Pompom-tipped Shadow Lichen				S3	12	19.6 ± 0.01	NS
N	*Peltigera collina*	Tree Pelt Lichen				S3	10	30.6 ± 0.5	NS
N	*Barbula convoluta*	Lesser Bird's-claw Beard Moss				S3?	3	21.6 ± 0.2	NS
N	*Calliergon giganteum*	Giant Spear Moss				S3?	2	36.2 ± 3.0	NS
N	*Drummondia prorepens*	a Moss				S3?	2	49.7 ± 5.0	NS
N	*Elodium blandowii*	Blandow's Bog Moss				S3?	6	22.3 ± 7.5	NS
N	*Mnium stellare*	Star Leafy Moss				S3?	3	40.4 ± 0.01	NS
N	*Sphagnum lindbergii*	Lindberg's Peat Moss				S3?	1	65.6 ± 0.01	NS
N	*Sphagnum riparium*	Streamside Peat Moss				S3?	3	29.4 ± 0.2	NS
N	*Cladonia stygia*	Black-footed Reindeer Lichen				S3?	9	24.2 ± 0.01	NS
N	*Anomodon rugelii*	Rugel's Anomodon Moss				S3S4	2	78.0 ± 0.6	NS
N	*Dichelyma capillaceum*	Hairlike Dichelyma Moss				S3S4	3	10.3 ± 3.0	NS
N	*Dicranum leioneuron*	a Dicranum Moss				S3S4	1	48.6 ± 0.01	NS
N	*Encalypta ciliata*	Fringed Extinguisher Moss				S3S4	2	77.5 ± 3.0	NS
N	*Myurella julacea*	Small Mouse-tail Moss				S3S4	1	90.0 ± 0.1	NS
N	*Splachnum ampullaceum*	Cruet Dung Moss				S3S4	2	35.7 ± 0.01	NS
N	*Thamnobryum alleghaniense*	a Moss				S3S4	10	65.3 ± 0.2	NS
N	*Tomentypnum nitens*	Golden Fuzzy Fen Moss				S3S4	4	37.7 ± 0.01	NS
N	*Schistidium agassizii*	Elf Bloom Moss				S3S4	3	48.2 ± 0.01	NS
N	*Hylocomiastrum pyrenaicum*	a Feather Moss				S3S4	1	25.1 ± 0.5	NS
N	*Bryoria pseudofuscescens*	Mountain Horsehair Lichen				S3S4	4	22.6 ± 5.5	NS
N	*Enchylium tenax*	Soil Tarpaper Lichen				S3S4	11	25.0 ± 0.31	NS
N	*Sticta fuliginosa*	Peppered Moon Lichen				S3S4	74	0.4 ± 0.5	NS
N	*Arctoparmelia incurva*	Finger Ring Lichen				S3S4	95	22.9 ± 0.01	NS
N	*Scytinium teretiusculum*	Curly Jellyskin Lichen				S3S4	14	24.6 ± 0.44	NS
N	*Leptogium acadiense*	Acadian Jellyskin Lichen				S3S4	43	22.7 ± 0.2	NS
N	*Scytinium subtile*	Appressed Jellyskin Lichen				S3S4	28	1.3 ± 0.2	NS
N	*Cladonia floerkeana*	Gritty British Soldiers Lichen				S3S4	4	39.0 ± 0.05	NS
N	*Vahliella leucophaea*	Shelter Shingle Lichen				S3S4	17	81.8 ± 0.01	NS
N	*Heterodermia speciosa*	Powdered Fringe Lichen				S3S4	72	24.9 ± 0.01	NS
N	*Leptogium corticola*	Blistered Jellyskin Lichen				S3S4	90	2.6 ± 0.2	NS
N	*Melanohalea olivacea*	Spotted Camouflage Lichen				S3S4	2	59.4 ± 0.4	NS
N	*Parmeliopsis hyperopta*	Gray Starburst Lichen				S3S4	2	74.3 ± 0.5	NS
N	*Parmotrema perlatum*	Powdered Ruffle Lichen				S3S4	35	27.8 ± 0.2	NS
N	*Peltigera hymenina*	Cloudy Pelt Lichen				S3S4	2	39.0 ± 2.0	NS
N	*Sphaerophorus fragilis*	Fragile Coral Lichen				S3S4	16	36.0 ± 0.01	NS
N	*Sclerophora peronella*	Frosted Glass-whiskers Lichen				S3S4	3	55.7 ± 0.01	NS
N	*Coccocarpia palmicola*	Salted Shell Lichen				S3S4	668	1.3 ± 0.2	NS
N	*Physcia caesia*	Blue-gray Rosette Lichen				S3S4	3	42.5 ± 1.0	NS
N	*Physcia tenella*	Fringed Rosette Lichen				S3S4	7	19.3 ± 0.01	NS
N	*Anaptychia palmulata*	Shaggy Fringed Lichen				S3S4	170	11.1 ± 0.5	NS
N	*Evernia prunastri*	Valley Oakmoss Lichen				S3S4	41	37.4 ± 0.2	NS
N	*Heterodermia neglecta*	Fringe Lichen				S3S4	141	16.5 ± 1.2	NS
P	*Clethra alnifolia*	Coast Pepper-Bush	Endangered	Threatened	Vulnerable	S2	5	20.5 ± 0.62	NS
P	*Juglans cinerea*	Butternut	Endangered	Endangered		SNA	5	21.6 ± 0.2	NS
P	*Fraxinus nigra*	Black Ash	Threatened		Threatened	S1S2	888	1.2 ± 0.1	NS
P	*Liatris spicata*	Dense Blazing Star	Threatened	Threatened		SNA	1	18.9 ± 0.2	NS
P	*Lophiola aurea*	Goldencrest	Special Concern	Special Concern	Vulnerable	S2	1	98.3 ± 1.0	NS

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P	*Lilaeopsis chinensis*	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S3	145	89.5 ± 0.01	NS
P	*Isoetes prototypus*	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S3	13	73.4 ± 0.5	NS
P	*Floerkea proserpinacoides*	False Mermaidweed	Not At Risk			S2S3	38	64.7 ± 7.07	NS
P	*Salix candida*	Sage Willow			Endangered	S1	1	24.5 ± 0.2	NS
P	*Acer saccharinum*	Silver Maple				S1	13	49.9 ± 0.2	NS
P	*Osmorhiza depauperata*	Blunt Sweet Cicely				S1	1	69.7 ± 5.0	NS
P	*Andersonglossum boreale*	Northern Wild Comfrey				S1	5	42.5 ± 1.6	NS
P	*Turritis glabra*	Tower Mustard				S1	1	84.3 ± 0.5	NS
P	*Lobelia spicata*	Pale-Spiked Lobelia				S1	8	58.2 ± 7.07	NS
P	*Ribes americanum*	Wild Black Currant				S1	4	40.4 ± 3.0	NS
P	*Fraxinus pennsylvanica*	Red Ash				S1	11	22.9 ± 5.0	NS
P	*Persicaria careyi*	Carey's Smartweed				S1	1	44.3 ± 3.0	NS
P	*Phytolacca americana*	Common Pokeweed				S1	4	17.2 ± 0.5	NS
P	*Podostemum ceratophyllum*	Horn-leaved Riverweed				S1	1	97.0 ± 0.1	NS
P	*Montia fontana*	Water Blinks				S1	1	25.2 ± 1.0	NS
P	*Lysimachia quadrifolia*	Whorled Yellow Loosestrife				S1	2	17.4 ± 0.2	NS
P	*Ranunculus pensylvanicus*	Pennsylvania Buttercup				S1	20	89.9 ± 0.01	NS
P	*Amelanchier nantucketensis*	Nantucket Serviceberry				S1	1	87.4 ± 1.0	NS
P	*Salix myrtillifolia*	Blueberry Willow				S1	1	33.2 ± 0.01	NS
P	*Salix serissima*	Autumn Willow				S1	2	33.1 ± 0.01	NS
P	*Carex digitalis*	Slender Wood Sedge				S1	1	98.1 ± 0.2	NS
P	*Carex garberi*	Garber's Sedge				S1	4	68.8 ± 0.01	NS
P	*Carex laxiflora*	Loose-Flowered Sedge				S1	2	78.2 ± 1.0	NS
P	*Carex ormostachya*	Necklace Spike Sedge				S1	1	92.9 ± 5.0	NS
P	*Carex plantaginea*	Plantain-Leaved Sedge				S1	5	49.2 ± 0.2	NS
P	*Carex prairea*	Prairie Sedge				S1	2	83.8 ± 1.0	NS
P	*Carex viridula var. saxilittoralis*	Greenish Sedge				S1	5	66.0 ± 2.0	NS
P	*Scirpus atrovirens*	Dark-green Bulrush				S1	5	23.8 ± 0.2	NS
P	*Iris prismatica*	Slender Blue Flag				S1	1	84.5 ± 100.0	NS
P	*Sisyrinchium fuscatum*	Coastal Plain Blue-eyed-grass				S1	1	95.3 ± 0.1	NS
P	*Juncus secundus*	Secund Rush				S1	1	88.3 ± 0.1	NS
P	*Juncus vaseyi*	Vasey Rush				S1	2	69.4 ± 0.02	NS
P	*Trillium grandiflorum*	White Trillium				S1	3	83.8 ± 1.0	NS
P	*Malaxis monophyllos var. brachypoda*	North American White Adder's-mouth				S1	5	71.7 ± 10.0	NS
P	*Spiranthes casei var. casei*	Case's Ladies'-Tresses				S1	1	69.1 ± 0.1	NS
P	*Dichanthelium xanthophysum*	Slender Panic Grass				S1	10	93.6 ± 1.6	NS
P	*Elymus hystrix*	Spreading Wild Rye				S1	13	33.5 ± 1.0	NS
P	*Adiantum pedatum*	Northern Maidenhair Fern				S1	25	24.7 ± 0.3	NS
P	*Equisetum palustre*	Marsh Horsetail				S1	2	78.4 ± 0.2	NS
P	*Botrychium lunaria*	Common Moonwort				S1	10	26.9 ± 0.2	NS
P	*Selaginella rupestris*	Rock Spikemoss				S1	1	41.6 ± 0.01	NS
P	*Solidago hispida*	Hairy Goldenrod				S1?	2	21.9 ± 7.07	NS
P	*Suaeda rolandii*	Roland's Sea-Blite				S1?	5	42.8 ± 2.0	NS
P	*Carex pensylvanica*	Pennsylvania Sedge				S1?	4	2.4 ± 0.05	NS
P	*Allium schoenoprasum*	Wild Chives				S1?	8	7.5 ± 0.2	NS
P	*Allium schoenoprasum var. sibiricum*	Wild Chives				S1?	1	61.0 ± 7.07	NS
P	*Crocanthemum canadense*	Long-branched Frostweed			Endangered	S1S2	2	29.3 ± 1.6	NS
P	*Cypripedium arietinum*	Ram's-Head Lady's-Slipper			Endangered	S1S2	332	37.6 ± 2.0	NS
P	*Sanicula odorata*	Clustered Sanicle				S1S2	12	37.9 ± 2.0	NS
P	*Draba glabella*	Rock Whitlow-Grass				S1S2	2	78.2 ± 0.05	NS
P	*Proserpinaca intermedia*	Intermediate Mermaidweed				S1S2	2	25.3 ± 0.9	NS
P	*Anemone virginiana var. alba*	Virginia Anemone				S1S2	5	61.0 ± 7.07	NS

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P	*Carex haydenii*	Hayden's Sedge				S1S2	3	38.5 ± 0.2	NS
P	*Platanthera huronensis*	Fragrant Green Orchid				S1S2	1	36.7 ± 10.0	NS
P	*Calamagrostis stricta ssp. stricta*	Slim-stemmed Reed Grass				S1S2	1	93.8 ± 7.07	NS
P	*Euphrasia farlowii*	Farlow's Eyebright				S1S3	1	96.9 ± 0.01	NS
P	*Carex vacillans*	Estuarine Sedge				S1S3	2	59.0 ± 0.01	NS
P	*Zizia aurea*	Golden Alexanders				S2	43	19.3 ± 0.2	NS
P	*Antennaria parlinii ssp. fallax*	Parlin's Pussytoes				S2	37	30.6 ± 7.07	NS
P	*Rudbeckia laciniata*	Cut-Leaved Coneflower				S2	39	24.5 ± 0.2	NS
P	*Arabis pycnocarpa*	Cream-flowered Rockcress				S2	1	72.7 ± 0.1	NS
P	*Cardamine maxima*	Large Toothwort				S2	3	69.8 ± 0.2	NS
P	*Hudsonia ericoides*	Pinebarren Golden Heather				S2	195	21.9 ± 7.07	NS
P	*Desmodium canadense*	Canada Tick-trefoil				S2	17	60.7 ± 5.0	NS
P	*Hylodesmum glutinosum*	Large Tick-trefoil				S2	24	37.9 ± 0.01	NS
P	*Conopholis americana*	American Cancer-root				S2	22	77.1 ± 1.0	NS
P	*Anemonastrum canadense*	Canada Anemone				S2	15	23.6 ± 0.2	NS
P	*Hepatica americana*	Round-lobed Hepatica				S2	81	25.8 ± 0.01	NS
P	*Ranunculus sceleratus*	Cursed Buttercup				S2	25	13.3 ± 0.01	NS
P	*Galium boreale*	Northern Bedstraw				S2	7	65.7 ± 1.0	NS
P	*Gratiola neglecta*	Clammy Hedge-Hyssop				S2	6	40.3 ± 0.2	NS
P	*Dirca palustris*	Eastern Leatherwood				S2	75	17.3 ± 1.0	NS
P	*Carex gynocrates*	Northern Bog Sedge				S2	2	33.2 ± 0.01	NS
P	*Carex pellita*	Woolly Sedge				S2	2	55.8 ± 10.0	NS
P	*Carex livida*	Livid Sedge				S2	13	15.7 ± 0.01	NS
P	*Juncus greenei*	Greene's Rush				S2	5	23.1 ± 10.0	NS
P	*Allium tricoccum*	Wild Leek				S2	88	66.7 ± 13.59	NS
P	*Lilium canadense*	Canada Lily				S2	112	14.8 ± 0.1	NS
P	*Cypripedium parviflorum var. pubescens*	Yellow Lady's-slipper				S2	28	11.9 ± 7.07	NS
P	*Cypripedium parviflorum var. makasin*	Small Yellow Lady's-Slipper				S2	13	39.4 ± 0.01	NS
P	*Cypripedium reginae*	Showy Lady's-Slipper				S2	59	32.4 ± 0.1	NS
P	*Platanthera flava var. flava*	Southern Rein Orchid				S2	2	67.9 ± 7.07	NS
P	*Platanthera flava var. herbiola*	Pale Green Orchid				S2	11	67.9 ± 1.0	NS
P	*Platanthera macrophylla*	Large Round-Leaved Orchid				S2	13	53.9 ± 1.0	NS
P	*Bromus latiglumis*	Broad-Glumed Brome				S2	28	52.6 ± 0.01	NS
P	*Cinna arundinacea*	Sweet Wood Reed Grass				S2	60	52.9 ± 0.01	NS
P	*Elymus wiegandii*	Wiegand's Wild Rye				S2	13	21.9 ± 7.07	NS
P	*Festuca subverticillata*	Nodding Fescue				S2	13	41.4 ± 5.0	NS
P	*Piptatheropsis pungens*	Slender Ricegrass				S2	2	82.9 ± 10.0	NS
P	*Cryptogramma stelleri*	Steller's Rockbrake				S2	3	49.0 ± 0.25	NS
P	*Cuscuta cephalanthi*	Buttonbush Dodder				S2?	1	45.3 ± 0.25	NS
P	*Rumex persicarioides*	Peach-leaved Dock				S2?	1	61.4 ± 0.01	NS
P	*Crataegus submollis*	Quebec Hawthorn				S2?	6	18.3 ± 7.07	NS
P	*Carex peckii*	White-Tinged Sedge				S2?	4	25.2 ± 0.01	NS
P	*Thuja occidentalis*	Eastern White Cedar			Vulnerable	S2S3	52	24.4 ± 0.01	NS
P	*Osmorhiza longistylis*	Smooth Sweet Cicely				S2S3	26	40.7 ± 0.01	NS
P	*Erigeron philadelphicus*	Philadelphia Fleabane				S2S3	2	56.4 ± 1.0	NS
P	*Lactuca hirsuta*	Hairy Lettuce				S2S3	3	21.7 ± 7.07	NS
P	*Impatiens pallida*	Pale Jewelweed				S2S3	3	78.0 ± 1.0	NS
P	*Caulophyllum thalictroides*	Blue Cohosh				S2S3	98	21.5 ± 0.01	NS
P	*Draba arabisans*	Rock Whitlow-Grass				S2S3	13	78.2 ± 0.01	NS
P	*Boechera stricta*	Drummond's Rockcress				S2S3	11	67.2 ± 0.01	NS
P	*Stellaria humifusa*	Saltmarsh Starwort				S2S3	4	52.5 ± 0.1	NS
P	*Oxybasis rubra*	Red Goosefoot				S2S3	2	66.0 ± 2.0	NS
P	*Hypericum majus*	Large St John's-wort				S2S3	19	100.0 ± 0.1	NS
P	*Hypericum x dissimulatum*	Disguised St. John's-wort				S2S3	6	17.2 ± 10.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Empetrum atropurpureum*	Purple Crowberry				S2S3	5	21.7 ± 7.07	NS
P	*Euphorbia polygonifolia*	Seaside Spurge				S2S3	12	75.0 ± 3.0	NS
P	*Myriophyllum farwellii*	Farwell's Water Milfoil				S2S3	8	24.6 ± 1.5	NS
P	*Hedeoma pulegioides*	American False Pennyroyal				S2S3	16	37.8 ± 5.0	NS
P	*Oenothera fruticosa ssp. tetragona*	Narrow-leaved Evening Primrose				S2S3	8	33.9 ± 7.07	NS
P	*Polygala polygama*	Racemed Milkwort				S2S3	1	23.1 ± 1.0	NS
P	*Polygonum aviculare ssp. buxiforme*	Box Knotweed				S2S3	7	48.7 ± 0.5	NS
P	*Polygonum oxyspermum ssp. raii*	Ray's Knotweed				S2S3	2	58.2 ± 1.0	NS
P	*Rumex triangulivalvis*	Triangular-valve Dock				S2S3	10	29.5 ± 0.5	NS
P	*Primula mistassinica*	Mistassini Primrose				S2S3	17	59.7 ± 1.0	NS
P	*Anemone quinquefolia*	Wood Anemone				S2S3	16	33.3 ± 0.01	NS
P	*Caltha palustris*	Yellow Marsh Marigold				S2S3	29	6.2 ± 0.25	NS
P	*Amelanchier fernaldii*	Fernald's Serviceberry				S2S3	1	91.9 ± 7.07	NS
P	*Potentilla canadensis*	Canada Cinquefoil				S2S3	15	14.0 ± 0.2	NS
P	*Salix pellita*	Satiny Willow				S2S3	7	38.7 ± 2.0	NS
P	*Tiarella stolonifera*	Stoloniferous Foamflower				S2S3	235	27.1 ± 0.01	NS
P	*Agalinis purpurea var. parviflora*	Small-flowered Purple False Foxglove				S2S3	4	77.0 ± 0.2	NS
P	*Boehmeria cylindrica*	Small-spike False-nettle				S2S3	56	16.9 ± 0.2	NS
P	*Carex adusta*	Lesser Brown Sedge				S2S3	10	25.0 ± 5.0	NS
P	*Carex capillaris*	Hairlike Sedge				S2S3	1	80.8 ± 0.02	NS
P	*Carex comosa*	Bearded Sedge				S2S3	6	45.6 ± 7.07	NS
P	*Carex houghtoniana*	Houghton's Sedge				S2S3	6	42.1 ± 1.2	NS
P	*Carex hystericina*	Porcupine Sedge				S2S3	9	16.2 ± 0.33	NS
P	*Eleocharis ovata*	Ovate Spikerush				S2S3	10	39.4 ± 0.01	NS
P	*Scirpus pedicellatus*	Stalked Bulrush				S2S3	7	18.6 ± 0.01	NS
P	*Vallisneria americana*	Wild Celery				S2S3	14	23.0 ± 1.2	NS
P	*Najas gracillima*	Thread-Like Naiad				S2S3	2	31.2 ± 0.45	NS
P	*Goodyera pubescens*	Downy Rattlesnake-Plantain				S2S3	18	22.2 ± 1.0	NS
P	*Spiranthes casei var. novaescotiae*	Case's Ladies'-Tresses				S2S3	1	38.7 ± 0.2	NS
P	*Spiranthes lucida*	Shining Ladies'-Tresses				S2S3	13	23.1 ± 1.3	NS
P	*Potamogeton friesii*	Fries' Pondweed				S2S3	10	62.3 ± 5.0	NS
P	*Woodsia glabella*	Smooth Cliff Fern				S2S3	2	71.4 ± 1.0	NS
P	*Botrychium lanceolatum ssp. angustisegmentum*	Narrow Triangle Moonwort				S2S3	7	40.4 ± 5.0	NS
P	*Botrychium simplex*	Least Moonwort				S2S3	4	37.8 ± 0.1	NS
P	*Ophioglossum pusillum*	Northern Adder's-tongue				S2S3	6	11.9 ± 7.07	NS
P	*Potamogeton pulcher*	Spotted Pondweed			Vulnerable	S3	8	55.5 ± 2.5	NS
P	*Angelica atropurpurea*	Purple-stemmed Angelica				S3	1	55.3 ± 0.01	NS
P	*Conioselinum chinense*	Chinese Hemlock-parsley				S3	3	37.7 ± 0.05	NS
P	*Hieracium robinsonii*	Robinson's Hawkweed				S3	3	59.6 ± 1.0	NS
P	*Iva frutescens*	Big-leaved Marsh-elder				S3	95	41.6 ± 0.01	NS
P	*Senecio pseudoarnica*	Seabeach Ragwort				S3	32	28.1 ± 1.5	NS
P	*Symphyotrichum boreale*	Boreal Aster				S3	3	61.0 ± 7.07	NS
P	*Symphyotrichum ciliolatum*	Fringed Blue Aster				S3	20	32.9 ± 0.01	NS
P	*Symphyotrichum undulatum*	Wavy-leaved Aster				S3	130	16.7 ± 7.07	NS
P	*Alnus serrulata*	Smooth Alder				S3	4	95.7 ± 0.01	NS
P	*Betula michauxii*	Michaux's Dwarf Birch				S3	31	1.4 ± 0.1	NS
P	*Betula pumila*	Bog Birch				S3	3	30.8 ± 0.01	NS
P	*Cardamine parviflora*	Small-flowered Bittercress				S3	14	45.5 ± 50.0	NS
P	*Palustricodon aparinoides*	Marsh Bellflower				S3	30	100.0 ± 0.01	NS
P	*Mononeuria groenlandica*	Greenland Stitchwort				S3	223	14.5 ± 0.5	NS
P	*Sagina nodosa*	Knotted Pearlwort				S3	63	25.9 ± 2.5	NS
P	*Sagina nodosa ssp. borealis*	Knotted Pearlwort				S3	10	45.3 ± 0.63	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Stellaria longifolia*	Long-leaved Starwort				S3	12	29.1 ± 5.0	NS
P	*Ceratophyllum echinatum*	Prickly Hornwort				S3	7	56.4 ± 0.01	NS
P	*Triosteum aurantiacum*	Orange-fruited Tinker's Weed				S3	60	37.4 ± 2.0	NS
P	*Viburnum edule*	Squashberry				S3	3	92.0 ± 0.01	NS
P	*Crassula aquatica*	Water Pygmyweed				S3	1	49.7 ± 0.1	NS
P	*Empetrum eamesii*	Pink Crowberry				S3	94	21.7 ± 7.07	NS
P	*Vaccinium uliginosum*	Alpine Bilberry				S3	4	37.5 ± 1.0	NS
P	*Halenia deflexa*	Spurred Gentian				S3	4	46.3 ± 0.01	NS
P	*Geranium bicknellii*	Bicknell's Crane's-bill				S3	16	23.4 ± 0.2	NS
P	*Myriophyllum verticillatum*	Whorled Water Milfoil				S3	3	35.7 ± 7.07	NS
P	*Epilobium densum*	Downy Willowherb				S3	7	40.2 ± 0.01	NS
P	*Polygala sanguinea*	Blood Milkwort				S3	53	13.5 ± 0.01	NS
P	*Persicaria arifolia*	Halberd-leaved Tearthumb				S3	22	30.5 ± 0.05	NS
P	*Plantago rugelii*	Rugel's Plantain				S3	11	22.7 ± 0.1	NS
P	*Primula laurentiana*	Laurentian Primrose				S3	22	77.2 ± 7.07	NS
P	*Samolus parviflorus*	Seaside Brookweed				S3	46	21.3 ± 5.0	NS
P	*Pyrola minor*	Lesser Pyrola				S3	3	36.2 ± 0.01	NS
P	*Anemone virginiana*	Virginia Anemone				S3	19	36.2 ± 5.0	NS
P	*Cephalanthus occidentalis*	Common Buttonbush				S3	9	25.2 ± 0.2	NS
P	*Galium labradoricum*	Labrador Bedstraw				S3	79	30.5 ± 0.05	NS
P	*Salix pedicellaris*	Bog Willow				S3	58	27.5 ± 0.05	NS
P	*Salix sericea*	Silky Willow				S3	124	8.4 ± 1.0	NS
P	*Saxifraga paniculata ssp. laestadii*	Laestadius' Saxifrage				S3	4	72.7 ± 7.07	NS
P	*Lindernia dubia*	Yellow-seeded False Pimperel				S3	34	37.3 ± 0.01	NS
P	*Laportea canadensis*	Canada Wood Nettle				S3	66	17.2 ± 0.01	NS
P	*Pilea pumila*	Dwarf Clearweed				S3	9	18.4 ± 0.2	NS
P	*Viola nephrophylla*	Northern Bog Violet				S3	8	37.5 ± 1.5	NS
P	*Carex bebbii*	Bebb's Sedge				S3	25	39.4 ± 0.01	NS
P	*Carex castanea*	Chestnut Sedge				S3	39	30.5 ± 0.01	NS
P	*Carex cryptolepis*	Hidden-scaled Sedge				S3	14	8.2 ± 6.5	NS
P	*Carex eburnea*	Bristle-leaved Sedge				S3	11	43.2 ± 1.0	NS
P	*Carex hirtifolia*	Pubescent Sedge				S3	49	27.9 ± 7.5	NS
P	*Carex lupulina*	Hop Sedge				S3	67	8.2 ± 6.7	NS
P	*Carex rosea*	Rosy Sedge				S3	45	36.5 ± 1.0	NS
P	*Carex swanii*	Swan's Sedge				S3	4	15.7 ± 0.2	NS
P	*Carex tenera*	Tender Sedge				S3	11	37.3 ± 0.1	NS
P	*Carex tribuloides*	Blunt Broom Sedge				S3	14	26.7 ± 0.01	NS
P	*Carex tuckermanii*	Tuckerman's Sedge				S3	38	36.9 ± 0.01	NS
P	*Carex atratiformis*	Scabrous Black Sedge				S3	3	85.0 ± 0.1	NS
P	*Eleocharis nitida*	Quill Spikerush				S3	11	30.1 ± 5.0	NS
P	*Eleocharis flavescens var. olivacea*	Bright-green Spikerush				S3	5	12.4 ± 0.25	NS
P	*Eriophorum gracile*	Slender Cottongrass				S3	7	28.4 ± 7.07	NS
P	*Coeloglossum viride*	Long-bracted Frog Orchid				S3	13	67.5 ± 1.0	NS
P	*Cypripedium parviflorum*	Yellow Lady's-slipper				S3	590	20.9 ± 0.2	NS
P	*Neottia bifolia*	Southern Twayblade				S3	172	1.8 ± 0.05	NS
P	*Platanthera flava*	Southern Rein-Orchid				S3	32	92.9 ± 0.01	NS
P	*Platanthera grandiflora*	Large Purple Fringed Orchid				S3	152	17.1 ± 0.34	NS
P	*Platanthera hookeri*	Hooker's Orchid				S3	33	37.9 ± 0.01	NS
P	*Dichanthelium linearifolium*	Narrow-leaved Panic Grass				S3	7	45.6 ± 7.07	NS
P	*Piptatheropsis canadensis*	Canada Ricegrass				S3	8	8.4 ± 1.0	NS
P	*Poa glauca*	Glaucous Blue Grass				S3	8	38.0 ± 1.0	NS
P	*Potamogeton praelongus*	White-stemmed Pondweed				S3	6	48.8 ± 5.0	NS
P	*Potamogeton richardsonii*	Richardson's Pondweed				S3	8	37.6 ± 0.01	NS
P	*Potamogeton zosteriformis*	Flat-stemmed Pondweed				S3	16	24.9 ± 0.85	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Asplenium viride*	Green Spleenwort				S3	12	71.7 ± 7.07	NS
P	*Dryopteris fragrans*	Fragrant Wood Fern				S3	16	71.9 ± 1.0	NS
P	*Sceptridium dissectum*	Dissected Moonwort				S3	8	71.9 ± 0.01	NS
P	*Polypodium appalachianum*	Appalachian Polypody				S3	24	13.7 ± 0.01	NS
P	*Persicaria amphibia var. emersa*	Long-root Smartweed				S3?	19	18.7 ± 0.01	NS
P	*Spiranthes ochroleuca*	Yellow Ladies'-tresses				S3?	40	25.5 ± 0.2	NS
P	*Diphasiastrum x sabinifolium*	Savin-leaved Ground-cedar				S3?	6	61.2 ± 0.1	NS
P	*Bidens vulgata*	Tall Beggarticks				S3S4	8	21.8 ± 0.2	NS
P	*Erigeron hyssopifolius*	Hyssop-leaved Fleabane				S3S4	25	40.6 ± 0.01	NS
P	*Hieracium paniculatum*	Panicled Hawkweed				S3S4	34	43.5 ± 11.0	NS
P	*Bidens beckii*	Water Beggarticks				S3S4	12	24.8 ± 0.5	NS
P	*Packera paupercula*	Balsam Groundsel				S3S4	111	33.7 ± 0.01	NS
P	*Atriplex glabriuscula var. franktonii*	Frankton's Saltbush				S3S4	13	49.4 ± 0.01	NS
P	*Shepherdia canadensis*	Soapberry				S3S4	114	32.9 ± 7.07	NS
P	*Vaccinium boreale*	Northern Blueberry				S3S4	3	44.2 ± 0.01	NS
P	*Vaccinium cespitosum*	Dwarf Bilberry				S3S4	76	31.4 ± 0.01	NS
P	*Vaccinium corymbosum*	Highbush Blueberry				S3S4	12	13.3 ± 0.01	NS
P	*Fagus grandifolia*	American Beech				S3S4	953	10.1 ± 5.06	NS
P	*Bartonia virginica*	Yellow Bartonia				S3S4	26	8.4 ± 7.07	NS
P	*Proserpinaca pectinata*	Comb-leaved Mermaidweed				S3S4	14	21.2 ± 1.5	NS
P	*Decodon verticillatus*	Swamp Loosestrife				S3S4	4	50.1 ± 0.2	NS
P	*Nuphar microphylla*	Small Yellow Pond-lily				S3S4	3	43.9 ± 0.01	NS
P	*Persicaria pensylvanica*	Pennsylvania Smartweed				S3S4	35	18.3 ± 7.07	NS
P	*Fallopia scandens*	Climbing False Buckwheat				S3S4	26	23.5 ± 0.43	NS
P	*Rumex pallidus*	Seabeach Dock				S3S4	1	35.6 ± 0.01	NS
P	*Pyrola asarifolia*	Pink Pyrola				S3S4	11	27.4 ± 50.0	NS
P	*Endotropis alnifolia*	Alder-leaved Buckthorn				S3S4	272	17.9 ± 0.01	NS
P	*Amelanchier spicata*	Running Serviceberry				S3S4	45	24.9 ± 0.01	NS
P	*Crataegus succulenta*	Fleshy Hawthorn				S3S4	1	13.8 ± 0.01	NS
P	*Fragaria vesca ssp. americana*	Woodland Strawberry				S3S4	68	18.0 ± 0.01	NS
P	*Fragaria vesca*	Woodland Strawberry				S3S4	6	23.6 ± 0.2	NS
P	*Galium aparine*	Common Bedstraw				S3S4	44	24.5 ± 0.08	NS
P	*Geocaulon lividum*	Northern Comandra				S3S4	6	44.3 ± 0.01	NS
P	*Limosella australis*	Southern Mudwort				S3S4	8	26.5 ± 3.5	NS
P	*Ulmus americana*	White Elm				S3S4	103	16.9 ± 0.07	NS
P	*Verbena hastata*	Blue Vervain				S3S4	282	16.5 ± 0.2	NS
P	*Viola sagittata var. ovata*	Arrow-Leaved Violet				S3S4	39	14.7 ± 0.01	NS
P	*Viola selkirkii*	Great-Spurred Violet				S3S4	5	32.6 ± 4.8	NS
P	*Symplocarpus foetidus*	Eastern Skunk Cabbage				S3S4	10	21.8 ± 0.2	NS
P	*Carex argyrantha*	Silvery-flowered Sedge				S3S4	9	52.7 ± 1.5	NS
P	*Sisyrinchium atlanticum*	Eastern Blue-Eyed-Grass				S3S4	4	77.9 ± 0.8	NS
P	*Triglochin gaspensis*	Gaspé Arrowgrass				S3S4	29	46.3 ± 0.01	NS
P	*Juncus acuminatus*	Sharp-Fruit Rush				S3S4	5	13.6 ± 0.01	NS
P	*Juncus subcaudatus*	Woods-Rush				S3S4	23	19.9 ± 1.5	NS
P	*Luzula parviflora ssp. melanocarpa*	Black-fruited Woodrush				S3S4	2	67.0 ± 0.01	NS
P	*Goodyera repens*	Lesser Rattlesnake-plantain				S3S4	8	47.7 ± 0.01	NS
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	8	1.3 ± 5.0	NS
P	*Platanthera obtusata*	Blunt-leaved Orchid				S3S4	8	21.9 ± 10.0	NS
P	*Platanthera orbiculata*	Small Round-leaved Orchid				S3S4	26	32.6 ± 4.8	NS
P	*Alopecurus aequalis*	Short-awned Foxtail				S3S4	18	22.6 ± 0.01	NS
P	*Dichanthelium clandestinum*	Deer-tongue Panic Grass				S3S4	303	14.7 ± 0.5	NS
P	*Panicum philadelphicum*	Philadelphia Panicgrass				S3S4	11	37.3 ± 0.01	NS
P	*Koeleria spicata*	Narrow False Oats				S3S4	16	38.1 ± 1.5	NS
P	*Asplenium trichomanes*	Maidenhair Spleenwort				S3S4	15	64.9 ± 0.85	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Equisetum pratense*	Meadow Horsetail				S3S4	16	38.3 ± 0.01	NS
P	*Diphasiastrum complanatum*	Northern Ground-cedar				S3S4	16	21.7 ± 1.0	NS
P	*Diphasiastrum sitchense*	Sitka Ground-cedar				S3S4	2	68.6 ± 5.0	NS
P	*Huperzia appressa*	Mountain Firmoss				S3S4	18	48.2 ± 7.07	NS
P	*Sceptridium multifidum*	Leathery Moonwort				S3S4	10	39.1 ± 10.0	NS
P	*Botrychium matricariifolium*	Daisy-leaved Moonwort				S3S4	7	27.0 ± 0.2	NS
P	*Viola canadensis*	Canada Violet				SH	2	45.2 ± 0.75	NS
P	*Greeneochloa coarctata*	Small Reedgrass				SH	1	25.1 ± 6.0	NS

5.1 SOURCE BIBLIOGRAPHY (100 km)

The recipient of these data shall acknowledge the AC CDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
7634	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
6996	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
5803	iNaturalist.ca. 2023. iNaturalist Data Export December 2022. iNaturalist.org; iNaturalist.ca, Web site: 128634 recs.
3011	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
2924	Pardieck, K.L., Ziolkowski Jr., D.J., Lutmerding, M., Aponte, V.I., and Hudson, M-A.R. 2020. North American Breeding Bird Survey Dataset 1966 - 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P9J6QUF6
1997	Paquet, Julie. 2018. Atlantic Canada Shorebird Survey (ACSS) database 2012-2018. Environment Canada, Canadian Wildlife Service.
1901	iNaturalist.ca. 2024. iNaturalist Data Export December 2023. iNaturalist.org; iNaturalist.ca.
1684	iNaturalist. 2020. iNaturalist Data Export 2020. iNaturalist.org and iNaturalist.ca, Web site: 128728 recs.
1115	eBird. 2020. eBird Basic Dataset. Version: EBD_relNov-2019. Ithaca, New York. Nov 2019, Cape Breton Bras d'Or Lakes Watershed subset. Cornell Lab of Ornithology.
924	Paquet, Julie. 2019. Atlantic Canada Shorebird Survey ACSS database for 2019. Environment Canada, Canadian Wildlife Service.
788	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2013. Atlantic Canada Conservation Data Centre Fieldwork 2013. Atlantic Canada Conservation Data Centre, 9000+ recs.
622	Cameron, E. 2008. Canadian Gypsum Co. survey 2007-08. Conestoga-Rovers & Assoc., 623 recs.
617	Eaton, S. 2014. Nova Scotia Wood Turtle Database. Environment and Climate Change Canada, 4843 recs.
614	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
582	iNaturalist.ca. 2024. iNaturalist Data Export December 2023 botany records. iNaturalist.org; iNaturalist.ca.
562	SwiftWatch. 2022. Total Chimney Swift counts from roost watches for the duration of the SwiftWatch program (2011-2021). Birds Canada.
467	Clayden, S. Digitization of Wolfgang Maass Nova Scotia forest lichen collections, 1964-2004. New Brunswick Museum. 2018.
464	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
447	Belliveau, A.G. 2020. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2019, 2020. E.C. Smith Herbarium.
379	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
351	Wildlife Division. 2021. Fraxinus nigra records assembled to define and model habitat. Nova Scotia Department of Natural Resources and Renewables.
347	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiau.ca/library/Herbarium/project/. 582 recs.
344	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
341	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # recs.
326	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
325	Scott, F.W. 2002. Nova Scotia Herpetofauna Atlas Database. Acadia University, Wolfville NS, 8856 recs.
299	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
287	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
262	Phinney, Lori. 2020. Pre- and post White-nose Syndrome bat acoustic monitoring, NS. Mersey Tobeatic Research Institute, 1279 recs.
255	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
251	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
249	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.
243	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre, 907 recs.
211	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
210	Churchill, J.L. 2022. Atlantic Canada Conservation Data Centre Fieldwork 2022. Atlantic Canada Conservation Data Centre.
209	Belliveau, A.G. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
206	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.
198	Neily, T.H. 2017. Nova Scotia lichen records. Mersey Tobeatic Research Institute.
198	Toms, B. 2018. Bat Species data from www.batconservation.ca for Nova Scotia. Mersey Tobeatic Research Institute, 547 Records.
176	Klymko, J. 2018. Maritimes Butterfly Atlas database. Atlantic Canada Conservation Data Centre.

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170	Bryson, I. 2013. Nova Scotia rare plant records. CBCL Ltd., 180 records.
168	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
161	Hagerman, Christianne. 2022. Wisqoq and Eastern White Cedar field work. E.C. Smith Herbarium, Acadia University.
156	Gallop, John. 2023. Species at Risk and Species of Conservation Interest records. McCallum Environmental.
150	Munro, Marian K. Tracked lichen specimens, Nova Scotia Provincial Museum of Natural History Herbarium. Atlantic Canada Conservation Data Centre. 2019.
145	Pepper, C. 2013. 2013 rare bird and plant observations in Nova Scotia. , 181 records.
142	Bryson, I.C. 2020. Nova Scotia flora and lichen observations 2020. Nova Scotia Environment, 139 recs.
140	Blaney, C.S & Spicer, C.D.; Popma, T.M.; Basquill, S.P. 2003. Vascular Plant Surveys of Northumberland Strait Rivers & Amherst Area Peatlands. Nova Scotia Museum Research Grant, 501 recs.
139	Brazner, J. 2016. Nova Scotia Forested Wetland Bird Surveys. Nova Scotia Department of Lands and Forestry.
138	Churchill, J.L. 2023. Atlantic Canada Conservation Data Centre Fieldwork 2023. Atlantic Canada Conservation Data Centre.
137	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
132	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
130	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
130	e-Butterfly. 2016. Export of Maritimes records and photos. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
119	Belliveau, A.G. 2021. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2021. E.C. Smith Herbarium.
117	iNaturalist. 2018. iNaturalist Data Export 2018. iNaturalist.org and iNaturalist.ca, Web site: 11700 recs.
115	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
114	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
112	e-Butterfly. 2019. Export of Maritimes records and photos. McFarland, K. (ed.) e-butterfly.org.
110	Chapman-Lam, C.J. 2021. Atlantic Canada Conservation Data Centre 2020 botanical fieldwork. Atlantic Canada Conservation Data Centre, 17309 recs.
99	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
96	Belliveau, A.G. & Churchill, J.L.; Anderson, F.; Brooks, F. 2023. Lichen Inventory of Blue Rocks, NS. E.C. Smith Herbarium.
96	Staicer, C. 2021. Additional compiled Nova Scotia Species at Risk bird records, 2005-2020. Dalhousie University.
93	Birds Canada. 2023. Maritimes Swiftwatch project data for 2023. Pers. comm., 270 recs.
93	Blaney, C.S. 2020. Sean Blaney 2020 field data. Atlantic Canada Conservation Data Centre, 4407 records.
92	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
92	Staicer, Cindy. 2022. 2021 Landbird Species at Risk observations. Dalhousie University.
90	Richardson, Leif. 2018. Maritimes Bombus records from various sources. Richardson, Leif.
87	McNeil, J.A. 2018. Wood Turtle records, 2018. Mersey Tobeatic Research Institute, 68 recs.
87	Mersey Tobeatic Research Institute. 2023. NS Blanding's Turtle GPS Logger Data. MTRI, 87 recs.
83	Hubley, Nicole. 2022. Monarch (Danaus plexippus) records submitted to MTRI from the 2021 field season. Mersey Tobeatic Research Institute.
75	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
74	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
74	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
73	Bryson, I. 2020. Nova Scotia and Newfoundland rare species observations, 2018-2020. Nova Scotia Environment.
73	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
72	Manthorne, A. 2014. MaritimesSwiftwatch Project database 2013-2014. Bird Studies Canada, Sackville NB, 326 recs.
72	Nussey, Pat & NCC staff. 2019. AEI tracked species records, 2016-2019. Chapman, C.J. (ed.) Atlantic Canada Conservation Data Centre, 333.
67	Toms, Brad & Pepper, Chris; Neily, Tom. 2022. Nova Scotia lichen database [as of 2022-04]. Mersey Tobeatic Research Institute.
65	Belliveau, A.G. 2014. Plant Records from Southern and Central Nova Scotia. Atlantic Canada Conservation Data Centre, 919 recs.
65	Klymko, John. 2024. Atlantic Canada Conservation Data Centre zoological fieldwork 2023. Atlantic Canada Conservation Data Centre.
65	Staicer, Cindy. 2023. 2022 SAR Bird field occurrences from the Landbirds at Risk Project, NS. Dalhousie University, 446 records.
64	Staicer, C. & Bliss, S.; Achenbach, L. 2017. Occurrences of tracked breeding birds in forested wetlands. , 303 records.
63	Brooks, Fiona. 2023. Field data - 2023. Atlantic Canada Conservation Data Centre.
63	Staicer, Cindy. 2023. 2022 SAR Bird ARU occurrences. Dalhousie University, 379 records.
60	Belliveau, A.G. 2018. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2018. E.C. Smith Herbarium, 6226 recs.
60	iNaturalist. 2020. iNaturalist butterfly records selected for the Maritimes Butterfly Atlas. iNaturalist.
56	Birds Canada. 2022. Maritimes Swiftwatch project data for 2022. Pers. comm., 155 records.
55	Belliveau, A.G. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 10695 recs.
55	LaPaix, R.W.; Crowell, M.J.; MacDonald, M.; Neily, T.D.; Quinn, G. 2017. Stantec Nova Scotia rare plant records, 2012-2016. Stantec Consulting.
53	Churchill, J.L. 2020. Atlantic Canada Conservation Data Centre Fieldwork 2020. Atlantic Canada Conservation Data Centre, 1083 recs.
50	Mersey Tobeatic Research Institute. 2023. 2023 Wood Turtle Records - Volunteer Collection. Mersey Tobeatic Research Institute, 50 recs.
48	NatureServe Canada. 2019. iNaturalist Maritimes Butterfly Records. iNaturalist.org and iNaturalist.ca.
47	Cameron, R.P. 2009. Erioderma pedicellatum database, 1979-2008. Dept Environment & Labour, 103 recs.
44	Feltham, Carter. 2022. Monarch (Danaus plexippus) and Milkweed MTRI records from the 2022 Field Season. Mersey Tobeatic Research Institute.
42	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
42	Coastal Action. 2024. SAR records from 2022. Coastal Action, 87 records.
42	Stewart, J.I. 2010. Peregrine Falcon Surveys in New Brunswick, 2002-09. Canadian Wildlife Service, Sackville, 58 recs.
41	Benjamin, L.K. (compiler). 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 15 spp, 224 recs.

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41	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-03-18]. Mersey Tobeatic Research Institute.
41	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
40	Cameron, E. 2007. Canadian Gypsum Co. survey 2005-07. Dillon Consulting Ltd, 40 recs.
40	Neily, T.H. & Pepper, C.; Toms, B. 2015. Nova Scotia lichen location database [as of 2015-02-15]. Mersey Tobeatic Research Institute, 1691 records.
39	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
39	Hall, R.A. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 189 recs.
39	Mersey Tobetic Research Institute. 2021. 2020 Monarch records from the MTRI monitoring program. Mersey Tobetic Research Institute, 72 records.
38	Hall, R.A. 2001. S.. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
38	Mazerolle, D.M. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 13515 recs.
38	Nova Scotia Nature Trust. 2013. Nova Scotia Nature Trust 2013 Species records. Nova Scotia Nature Trust, 95 recs.
37	Pepper, C. 2021. Rare bird, plant and mammal observations in Nova Scotia, 2017-2021.
36	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre, 2318 recs.
34	Ogden, J. NS DNR Butterfly Collection Dataset. Nova Scotia Department of Natural Resources. 2014.
33	Haughian, Sean. 2021. Update to lichen data from 2017-2021. Nova Scotia Museum.
33	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
33	Mazerolle, D.M. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
32	Patrick, A.; Horne, D.; Noseworthy, J. et. al. 2017. Field data for Nova Scotia and New Brunswick, 2015 and 2017. Nature Conservancy of Canada.
31	Blaney, C.S.; Mazerolle, D.M.; Hill, N.M. 2011. Nova Scotia Crown Share Land Legacy Trust Fieldwork. Atlantic Canada Conservation Data Centre, 5022 recs.
31	Cameron, R.P. 2018. Degelia plumbea records. Nova Scotia Environment.
31	Chapman, C.J. 2019. Atlantic Canada Conservation Data Centre 2019 botanical fieldwork. Atlantic Canada Conservation Data Centre, 11729 recs.
30	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
30	Neily, T.H. 2019. Tom Neily NS Bryophyte records (2009-2013). T.H. Neily, Atlantic Canada Conservation Data Centre, 1029 specimen records.
29	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
28	Brazner, John; MacKinnon, Frances. 2020. Relative conservation value of Nova Scotia's forests: forested wetlands as avian biodiversity hotspots. Canadian Journal of Forest Research, 50(12): 1307-1322. dx.doi.org/10.1139/cjfr-2020-0101.
28	Mersey Tobeatic Research Institute. 2023. NS Turtle Records. Mersey Tobeatic Research Institute, 214 recs.
28	Pepper, Chris. 2012. Observations of breeding Canada Warbler's along the Eastern Shore, NS. Pers. comm. to S. Blaney, Jan. 20, 28 recs.
27	Westwood, A., Staicer, C. 2016. Nova Scotia landbird Species at Risk observations. Dalhousie University.
26	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
26	Neily, T.H. 2013. Email communication to Sean Blaney regarding Listera australis observations made from 2007 to 2011 in Nova Scotia. , 50.
26	Porter, Caitlin. 2021. Field data for 2020 in various locations across the Maritimes. Atlantic Canada Conservation Data Centre, 3977 records.
25	Atlantic Canada Conservation Data Centre. 2020. Cape LaHave Island observations from August 2020. Atlantic Canada Conservation Data Centre, 605 records.
25	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
24	Belliveau, A.G. 2021. New Black ash site records near Kentville, NS. Acadia University, 47 records.
24	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
23	Ferguson, D.C. 1954. The Lepidoptera of Nova Scotia. Part I, macrolepidoptera. Proceedings of the Nova Scotian Institute of Science, 23(3), 161-375.
23	LaPaix, Rich. 2022. Rare species observations, 2018-2022. Nova Scotia Nature Trust.
22	Belliveau, A. 2013. Rare species records from Nova Scotia. Mersey Tobeatic Research Institute, 296 records. 296 recs.
22	Brazner, John. 2022. Clearcut Transect Study. Nova Scotia Department of Natural Resources and Renewables Wildlife Division.
22	Nelly, T.H. 2006. Cypripedium arietinum in Hants Co. Pers. comm. to C.S. Blaney. 22 recs, 22 recs.
22	NS DNR. 2017. Black Ash records from NS DNR Permanent Sample Plots (PSPs), 1965-2016. NS Dept of Natural Resources.
21	Chapman-Lam, C.J. 2022. Atlantic Canada Conservation Data Centre 2021 botanical fieldwork. Atlantic Canada Conservation Data Centre, 15099 recs.
20	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
20	Cole Vail. 2023 Lichen Observations. C.Vail, 23 recs.
20	Crowell, Iain & Crowell, Iain. 2023. Field data - 2023. Atlantic Canada Conservation Data Centre.
20	McNeil, J.A. 2016. Blandings Turtle (Emydoidea blandingii), Eastern Ribbonsnake (Thamnophis sauritus), Wood Turtle (Glyptemys insculpta), and Snapping Turtle (Chelydra serpentina) sightings, 2016. Mersey Tobeatic Research Institute, 774 records.
20	Siemens-Worsley, Allison. 2024. iNaturalist Wood Turtle observations for New Brunswick and Nova Scotia. NatureServe Canada.
19	Ogden, K. Nova Scotia Museum butterfly specimen database. Nova Scotia Museum. 2017.
19	Powell, B.C. 1967. Female sexual cycles of Chrysemy spicta & Clemmys insculpta in Nova Scotia. Can. Field-Nat., 81:134-139. 26 recs.
19	Richardson, D., Anderson, F., Cameron, R, McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen (Anzia colpodes). COSEWIC.
19	Robinson, S.L. 2014. 2013 Field Data. Atlantic Canada Conservation Data Centre.
17	Anderson, Frances; Neily, Tom. 2010. A Reconnaissance Level Survey of Calciphilous Lichens in Selected Karst Topography in Nova Scotia with Notes on Incidental Bryophytes. Mersey Tobeatic Research Institute.
17	Cameron, R.P. 2014. 2013-14 rare species field data. Nova Scotia Department of Environment, 35 recs.
17	MacDonald, E.C. 2018. CWS Piping Plover Census, 2010-2017. Canadian Wildlife Service, 672 recs.
17	Neily, T.H. 2010. Erioderma Pedicellatum records 2005-09. Mersey Tobiatic Research Institute, 67 recs.
16	Hill, N.M. 1994. Status report on the Long's bulrush Scirpus longii in Canada. Committee on the Status of Endangered Wildlife in Canada, 7 recs.
16	Manthorne, A. 2019. Incidental aerial insectivore observations. Birds Canada.
16	McNeil, Jeffie. 2023. 2022 Turtle Records. Mersey Tobeatic Research Institute.

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16	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
16	Nature Conservancy of Canada. 2022. NCC Field data for Nova Scotia. Nature Conservancy of Canada.
15	Archibald, D.R. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 213 recs.
15	Basquill, S.P. 2011 vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
15	Cameron, R.P. 2013. 2013 rare species field data. Nova Scotia Department of Environment, 71 recs.
15	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2011. Atlantic Canada Conservation Data Centre. Sackville NB, 760 recs.
15	Neily, T.H. & Pepper, C. 2020. Nova Scotia SMP lichen surveys 2020. Mersey Tobeatic Research Institute.
14	e-Butterfly. 2018. Selected Maritimes butterfly records from 2016 and 2017. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
14	Klymko, J.J.D. 2018. 2017 field data. Atlantic Canada Conservation Data Centre.
13	Holder, M. 2003. Assessment and update status report on the Eastern Lilaeopsis (Lilaeopsis chinensis) in Canada. Committee on the Status of Endangered Wildlife in Canada, 16 recs.
13	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-05-25]. Mersey Tobeatic Research Institute, 668 recs.
13	Neily, T.H. 2012. 2012 Erioderma pedicellatum records in Nova Scotia.
13	Nova Scotia Nature Trust. 2014. Ladyslipper records from Saint Croix Nova Scotia, JLC Ed. Nova Scotia Nature Trust.
13	Patrick, Allison. 2021. Animal and plant records from NCC properties from 2019 and 2020. Nature Conservancy Canada.
13	Robinson, S.L. 2015. 2014 field data.
13	Toms, Brad. 2024. MTRI lichens database. Mersey Tobeatic Research Institute, 170 records.
12	Basquill, S.P. 2012. 2012 rare vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
12	Cameron, R.P. 2017. 2017 rare species field data. Nova Scotia Environment, 64 recs.
12	Skomorowski, Joanna. 2024. 2022 Nova Scotia Nature Trust SAR occurrences. Nova Scotia Nature Trust, 58 records.
11	Korol, Burke. 2023. Field data - 2023. Atlantic Canada Conservation Data Centre.
11	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen (Pannaria lurida). COSEWIC.
10	Belliveau, A.G. & Vail, Cole; King, Katie. 2020. New Allium tricoccum locations, Cornwallis River. Chapman, C.J. (ed.) Acadia University.
10	Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.
10	Bredin, K.A. 2002. NS Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centere, 30 recs.
10	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
10	Churchill, J.L.; Walker, J. 2017. Species at Risk Surveys at Correctional Services Canada Properties in Nova Scotia and New Brunswick. Atlantic Canada Conservation Data Centre.
10	Gilhen, J. 1984. Amphibians & Reptiles of Nova Scotia, 1st Ed. Nova Scotia Museum, 164pp.
10	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort (Isoetes prototypus). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
10	Neily, T. H. 2018. Lichen and Bryophyte records, AEI 2017-2018. Tom Neily; Atlantic Canada Conservation Data Centre.
9	Benjamin, L.K. 2006. Cypripedium arietinum. Pers. comm. to D. Mazerolle. 9 recs, 9 recs.
9	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
9	Cameron, R.P. 2005. Erioderma pedicellatum unpublished data. NS Dept of Environment, 9 recs.
9	Cameron, R.P. 2006. Erioderma pedicellatum 2006 field data. NS Dept of Environment, 9 recs.
9	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
9	Mersey Tobeatic Research Institute. 2023. Monarch (Danaus plexippus) and Milkweed MTRI records from the 2023 Field Season. Mersey Tobeatic Research Institute.
8	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of C. insculpta sightings. Acadia University, Wolfville NS, 88 recs.
8	Chapman, C.N. (Cody). 2020. Nova Scotia Black Ash (Fraxinus nigra) field observations by Confederacy of Mainland Mi'kmaq. Forestry Program, Confederacy of Mainland Mi'kmaq.
8	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
8	King, Katie; Jean, Samuel. 2021. Black ash observations near Booklyn, NS. E.C. Smith Herbarium.
8	Klymko, J. Butterfly records at the Nova Scotia Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2017.
8	McNeil, J.A. 2014. Blandings Turtle (Emydoidea blandingii) and Snapping Turtle (Chelydra serpentina) sightings, 2014. Mersey Tobeatic Research Institute.
8	Neily, T.H. & Anderson, F. 2011. Lichen observations from NRC site at Sandy Cove. , 97.
8	Phinney, Lori; Toms, Brad; et. al. 2016. Bank Swallows (Riparia riparia) in Nova Scotia: inventory and assessment of colonies. Merset Tobeiatc Research Institute, 25 recs.
8	Sollows, M.C,. 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
8	Webster, R.P. Atlantic Forestry Centre Insect Collection, Maritimes butterfly records. Natural Resources Canada. 2014.
7	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
7	Boyne, A.W. & Grecian, V.D. 1999. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 23 recs.
7	Cameron, B. 2006. Hepatica americana Survey at Scotia Mine Site in Gays River, and Discovery of Three Yellow-listed Species. Conestoga-Rovers and Associates, (a consulting firm), october 25. 7 recs.
7	Klymko, J.J.D.; Robinson, S.L. 2014. 2013 field data. Atlantic Canada Conservation Data Centre.
7	MacDonald, E.C. 2018. Piping Plover nest records from 2010-2017. Canadian Wildlife Service.
7	Tsehtik, M.; Leblanc, M.; Creaser, T. 2020. Coastal Action: 2020 Species at Risk Data. Coastal Action, 40 records.
6	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.
6	Blaney, C.S; Korol, J.B.; Crowell, I. 2023. 2022 AC CDC Botany program field data. Atlantic Canada Conservation Data Centre, 5293 records.
6	Brazner, J.; Hill, N. 2018. Plant observations along the Cornwallis River, Nova Scotia. Nova Scotia Department of Lands and Forestry.
6	Canadian National Collection of Insects Arachnids, and Nematodes Bombus specimen database export. Government of Canada. 2022.
6	Clayden, S.R. 2005. Confidential supplement to Status Report on Ghost Antler Lichen (Pseudevernia cladonia). Committee on the Status of Endangered Wildlife in Canada, 27 recs.
6	Gallop, John. 2021. Sheet Harbour rare lichen observations. McCallum Environmental.
6	Hall, R. 2008. Rare plant records in old fieldbook notes from Truro area. Pers. comm. to C.S. Blaney. 6 recs, 6 recs.
6	Klymko, J.J.D. 2012. Odonata specimens & observations, 2010. Atlantic Canada Conservation Data Centre, 425 recs.

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6	Matthew Smith. 2010. Field trip report from Avon Caving Club outlining the discovery of Cyrpipedium arietinum and Hepatica nobilis populations. Public Works and Government Services Canada.
6	Mazerolle, D.M. 2020. Atlantic Canada Conservation Data Centre botanical fieldwork 2019. Atlantic Canada Conservation Data Centre.
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6	Neily, T.H. Tom Neily NS Sphagnum records (2009-2014). T.H. Neily, Atlantic Canada Conservation Data Centre. 2019.
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6	White, S. 2019. Notable species sightings, 2018. East Coast Aquatics.
6	Whittam, R.M. 1999. Status Report on the Roseate Tern (update) in Canada. Committee on the Status of Endangered Wildlife in Canada, 36 recs.
5	Basquill, S.P., Porter, C. 2019. Bryophyte and lichen specimens submitted to the E.C. Smith Herbarium. NS Department of Lands and Forestry.
5	Brad Toms. 2024. Erioderma mollissimum records. Mersey Tobeatic Reasearch Institute, 57 recs.
5	Cameron, R.P. 2012. Additional rare plant records, 2009. , 7 recs.
5	Carter, Jeff; Churchill, J.; Churchill, I.; Churchill, L. 2020. Bank Swallow colony Scots Bay, NS. Atlantic Canada Conservation Data Centre.
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5	McNeil, J.A. 2019. Snapping Turtle records, 2019. Mersey Tobeatic Research Institute.
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5	Pohl, G.P. Specimen data from Northern Forest Research Centre. Northern Forest Research Centre. 2022.
5	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
5	Porter, K. 2013. 2013 rare and non-rare vascular plant field data. St. Mary's University, 57 recs.
5	Towell, C. 2014. 2014 Northern Goshawk and Common Nighthawk email reports, NS. NS Department of Natural Resources.
5	Walker, J. 2017. Bird inventories at French River, NS, and Memramcook, NB, for Nature Conservancy of Canada. Pers. comm. to AC CDC.
4	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville, 667 recs.
4	Blaney, C.S.; Mazerolle, D.M. 2009. Fieldwork 2009. Atlantic Canada Conservation Data Centre. Sackville NB, 13395 recs.
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4	Cameron, R.P. 2009. Nova Scotia nonvascular plant observations, 1995-2007. Nova Scotia Dept Natural Resources, 27 recs.
4	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
4	Cody, W.J. 2003. Nova Scotia specimens of Equisetum pratense at the DAO herbarium in Ottawa. , Pers. comm. to C.S. Blaney. 4 recs.
4	Forsythe, B. 2006. Cypripedium arietinum at Meadow Pond, Hants Co. Pers. comm. to C.S. Blaney. 4 recs, 4 recs.
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4	Klymko, J. Dataset of butterfly records at the New Brunswick Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2016.
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4	Mills, Pamela. 2007. Iva frutescens records. Nova Scotia Dept of Natural Resources, Wildlife Div. Pers. comm. to S. Basquil, 4 recs.
4	Newell, R. & Neily, T.; Toms, B.; Proulx, G. et al. 2011. NCC Properties Fieldwork in NS: August-September 2010. Nature Conservancy Canada, 106 recs.
4	Sabine, D.L. Bombus terricola specimens in Dwayne Sabine's personal collection. pers. comm. 2022.
3	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
3	Basquill, S.P. 2009. 2009 field observations. Nova Scotia Dept of Natural Resources.
3	Benjamin, L.K. 2009. NSDNR Fieldwork & Consultants Reports. Nova Scotia Dept Natural Resources, 143 recs.
3	Cameron-MacMillan, Maureen. 2020. Northern Goshawk Nests in Eastern Nova Scotia, as of November, 2020. Nova Scotia Department of Lands and Forestry.
3	Chapman, Cody. Unreported Species at Risk Records across Nova Scotia. Chapman, Cody, 5 records.
3	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
3	Doubt, J. 2013. Email to Sean Blaney with Nova Scotia records of Fissidens exilis at Canadian Museum of Nature. pers. comm., 3 records.
3	Haughian, S.R. 2018. Description of Fuscopannaria leucosticta field work in 2017. New Brunswick Museum, 314 recs.
3	Hill, N. and D. Patriquin. 2013. 2013 rare plant observations in Williams Lake Backlands area. Fern Hill Institute of Plant Conservation, Berwick, Nova Scotia, 3 records.
3	McLean, K. 2020. Species occurrence records from Clean Annapolis River Project fieldwork in 2020. Clean Annapolis River Project, 206 records.
3	Nova Scotia Department of Lands and Forestry. 2018. Wood Turtle observations in, or near, the cornwallis River watershed. NS DLF, pers. comm. to AC CDC.
3	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J; ONHIC, 487 recs.
3	Rock, J. 2020. Atlantic Canada Piping Plover field surveys: Nesting pairs by beach, 2018-2020. Environment and Climate Change Canada - Canadian Wildlife Service, 216 records.
3	Sabine, M. 2016. NB DNR staff incidental Black Ash observations. New Brunswick Department of Natural Resources.
3	Thompson, R. 2018. Williamsdale Quarry Expansion Project, NS, Environmental Assessment rare plants. Dexter Construction Company Limited.
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2	Amiro, Peter G. 1998. Atlantic Salmon: Inner Bay of Fundy SFA 22 & part of SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-12. 4 recs.
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2	Cameron, B. 2005. C. palmicola, E. pedicellatum records from Sixth Lake. Pers. comm. to C.S. Blaney. 3 recs, 3 recs.
2	Cameron, R.P. 2012. Rob Cameron 2012 vascular plant data. NS Department of Environment, 30 recs.
2	Frittaion, C. 2012. NSNT 2012 Field Observations. Nova Scotia Nature Trust, Pers comm. to S. Blaney Feb. 7, 34 recs.

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2	LaPaix, R.; Parker, M. 2013. email to Sean Blaney regarding Listera australis observations near Kearney Lake. East Coast Aquatics, 2.
2	Lock, A.R., Brown, R.G.B. & Gerriets, S.H. 1994. Gazetteer of Marine Birds in Atlantic Canada. Canadian Wildlife Service, Atlantic Region, 137 pp.
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2	Mazerolle, David. 2021. Botanical fieldwork 2019-20200. Parks Canada.
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2	McNeil, Jeffie. 2022. Ribbonsnake records, 2021. Mersey Tobeatic Research Institute.
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2	Neily, T.H.; Smith, C.; Whitman, E. 2011. NCC Logging Lake (Halifax Co. NS) properties baseline survey data. Nature Conservancy of Canada, 2 recs.
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1	Anderson, Frances. 2022. Heterodermia squamulosa record near Lunenburg, NS. pers. comm.
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1	Basquill, S.P.; Quigley, E. 2006. New Minuartia groenlandica record for NS. Pers. comm. to C.S. Blaney, Oct 6, 1 rec.
1	Basset, I.J. & Crompton, C.W. 1978. The Genus Suaeda (Chenopodiaceae) in Canada. Canadian Journal of Botany, 56: 581-591.
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1	Belliveau, A.G. E.C. Smith Herbarium Specimen Database 2019. E.C. Smith Herbarium, Acadia University. 2019.
1	Benjamin, L.K. 2003. Cypripedium arietinum in Cogmagun River NS. Pers. comm. to S. Blaney, 1 rec.
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1	Crowell, A. 2004. Cypripedium arietinum in Weir Brook, Hants Co. Pers. comm. to S. Blaney, 1 rec.
1	Crowell, M. 2013. email to Sean Blaney regarding Listera australis at Bear Head and Mill Cove Canadian Forces Station. Jacques Whitford Environmental Ltd., 2.
1	deGooyer, K. 2019. Snapping Turtle and Eastern White Cedar observations. Nova Scotia Environment.
1	Docherty, Joanne. 2022. Phone call to John Klymko about Danaus plexippus observation in Nova Scotia. Personal communication.
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1	Eastman, A. 2019. Snapping Turtle observation at Brookfield, Colchester Co. NS. Halifax Field Naturalists Nova Scotia Nature Archive Facebook Page, 1 record.
1	Edge, Thomas A. 1984. Status report on the Atlantic Whitefish (Coregonus huntsmani). Committee on the Status of Endangered Wildlife in Canada.
1	Golder Associates Ltd. 2021. Black Ash location from Goff's Quarry Expansion Environment Assessment, 2017. Golder Associates Ltd., 1 record.
1	Hill, N. 2023. Observation record of Halenia deflexa on the headland barrens W of Prospect, Halifax Co. pers. comm., 1 record.
1	Hill, N.; Manning, I. 2020. Wild Leek observation, Cornwallis River, NS, floodplain. pers. comm. to J. Churchill.
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1	Honeyman, K. 2019. Unique Areas Database, 2018. J.D. Irving Ltd.

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1	Klymko, J.J.D. 2010. Miscellaneous observations reported to ACCDC (zoology). Pers. comm. from various persons, 3 recs.
1	Klymko, J.J.D. 2012. Insect field work & submissions. Atlantic Canada Conservation Data Centre, 852 recs.
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1	MacKinnon, D.; Wright, P.; Smith, D. 2014. 2014 Common Tern email report, Eastern Passage, NS. NS Department of Environment.
1	Majka, C.G. & McCorquodale, D.B. 2006. The Coccinellidae (Coleoptera) of the Maritime Provinces of Canada: new records, biogeographic notes, and conservation concerns. Zootaxa. Zootaxa, 1154: 49–68. 7 recs.
1	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
1	McKendry, Karen. 2016. Rare species observations, 2016. Nova Scotia Nature Trust, 19 recs.
1	NatureServe Canada. 2018. iNaturalist Butterfly Data Export . iNaturalist.org and iNaturalist.ca.
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1	Neily, T.H. & Pepper, C.; Toms, B. 2019. Boreal Felt Lichen Observation, April 2019. Mersey Tobeatic Research Institute.
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1	Parker, M. 2016. Wood turtle (Glyptemys insculpta) Visual Surveys at Black, Wallace, Musquodobit and Sackville Rivers, Nova Scotia. East Coast Aquatics Inc., 3 records.
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1	Payzant, P. 2018. Satyr Comma record from Bible Hill, NS. https://novascotiabutterflies.ca.
1	Phinney, L. 2019. Little Brown Myotis maternal colony counts and birdSAR, 2019. Mersey Tobeatic Research Institute.
1	Scott, F.W. 1988. Status Report on the Southern Flying Squirrel (Glaucomys volans) in Canada. Committee on the Status of Endangered Wildlife in Canada, 2 recs.
1	Shortt, R. UNB specimen data for various tracked species formerly considered secure. Connell Memorial Herbarium, UNB, Fredericton NB. 2019.
1	Skevington, Jeffrey H. 2020. Syrphid records used for the Field Guide to the Flower Flies of Northeastern North America. Canadian National Collection of Insects.
1	Sollows, M.C,. 2009. NBM Science Collections databases: Coccinellid & Cerambycid Beetles. New Brunswick Museum, Saint John NB, download Feb. 2009, 569 recs.
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1	Stewart, P. 2013. email to Sean Blaney regarding the discovery of a Listera australis population at Blockhouse. Envirosphere Consultants Limited, 1.
1	Toms, Brad. 2022. Non-Lichen Observations from Lichen SMP and NCC Property Searches. Mersey Tobeatic Research Institute.
1	WIlliams, M. Cape Breton University Digital Herbarium. Cape Breton University Digital Herbarium. 2013.
1	Wilson, G. 2013. 2013 Snapping Turtle email report, Wentworth, NS. Pers. comm.

Appendix F
Contingency Plan

ENGLOBE

CONTINGENCY AND EMERGENCY RESPONSE PLAN

GFL Environmental Services Inc.

Aerotech Service Centre

203 Aerotech Dr, Goffs, NS B2T 1K3

October 2024

Revision 00 - DRAFT

Originated by:

Approval			Distribution		
Required*		**Signature**	**Copy #**		****
-	VP EHS		Original	Environmental, Health & Safety Management System Manual (EHSMS)	x
-	EHS Manager		1		
-	EHS Advisor		2		
x	District Manager				
-	Operations Supervisor				
-					
-					
-					

Reviewed and released for implementation in the branch.

Representative: _____ Date: _____

The holder of each manual is responsible for keeping the manual updated with that latest issues of specifications / procedures

* Functions requiring approval are denoted by “x”. Functions not requiring approval are denoted by “-“.

** Associates who are document holders are identified by “x”. Those who are not document holders are identified by “-“.

Amendment Sheet

Amendment Description	Rev #	By	Page #	Issue Date	Comments
Original Issue	00		All		

Table of Contents

1. INTRODUCTION

This Contingency and Emergency Response Plan provides operating guidelines to meet those foreseeable emergencies which may arise during the operation of the Aerotech facility in Goffs, Nova Scotia.

The objectives of the Contingency and Emergency Response Plan are to enable GFL Environmental Services Inc., owner/operator of the facility, to respond to all emergency situations and to minimize GFL Environmental Services Inc.'s exposure to loss and any impact on the environment from such situations. The objective will be met by providing for:

- The safety of employees, contractors, visitors, customers, and the public
- The continued security of the facility
- An effective incident reporting system
- Minimizing damage to the environment
- Identify what emergency situations are likely to occur
- Reduce disruption and confusion created by emergencies
- Minimize the time and effort to regain control
- Minimize the potential for injury or other types of losses
- Prevent fatalities and injuries
- Reduce damage to buildings and equipment
- Accelerating the resumption of normal operation
- Determine the appropriate response
- Establish communication channels, both inter-company and extra-company
- Identify jurisdictions
- Reduce recovery time
- Reduce time to affect remedial plans
- Keep public confidence.

The Aerotech facility currently receives, and stores used oil under their used oil collection and storage approval.

The facility currently receives and treats industrial wastewater through an existing industrial approval. Water is sampled and treated onsite and discharged within the specified parameters to Halifax Water.

The Aerotech facility will store waste for two to four weeks on average, and no longer than 90 days. GFL is estimating based on current volumes that 50,000 (205L) drum equivalents will be cycled through the year on an annual basis.

Waste would be received through the loading docks and then securely placed within the facility in designated areas. Drums would be opened, sampled (where required), and consolidated (based on compatibility) to reduce overall shipping capacities when transported from the facility for final disposal.

There would be a dedicated room for repacking of compatible wastes. Within this dedicated room, there would be a "pump out" chamber that would allow for consolidation of compatible rich and lean wastes to be pumped to certified tanks that are stored in containment outside of the building on the property.

Receipt and storage of bulk flammable liquids would occur in certified tanks in containment on the outside of the building on the property.

Sorting and consolidation of waste batteries may occur within the building.

Bulking of wastes will result in more efficient loads for final disposal, therefore reducing environmental impact.

2. AEROTECH FACILITY DETAILS

Facility Address

GFL Environmental Services Inc.
203 Aerotech Drive
Goffs, NS B2T 1K3

Telephone: 902-835-9095
Contact: Troy Canning – District Manager

Operations Office Address

GFL Environmental Services Inc.
203 Aerotech Drive
Goffs, NS B2T 1K3

Telephone: 902-835-9095
Contact: Troy Canning – District Manager

Head Office Address

GFL Environmental Services Inc.
100 New Park Place, Suite 500
Vaughan, ON L4K 0H9
Telephone: (905) 326-0101
Contact: Brian Hillier – Vice President, Environment and Compliance
Ruth L. Uy – Vice President, Health and Safety

A driving map showing the route to the facility will be provided to the list below.

- Fire Department
- Ambulance
- Police/RCMP

A Google map image of the facility (Appendix 1) and the Facility Site Plan (Appendix 2) are available at the facility. Also, a map showing the local businesses and residents has been made up and is available at the facility (Appendix 3).

2.1 Emergency Numbers and Statement

This page is to be posted beside all phones. It lists the emergency phone numbers and gives written instructions on the route to the facility.

EMERGENCY NUMBERS AND STATEMENT

EMERGENCY	911
POISON CENTRE	(902) 428-8161 or 1-800-565-8161
GFL 24 HOUR	(902) 468-9011

GIVE THIS STATEMENT IN AN EMERGENCY:

THIS IS AN EMERGENCY!

MY NAME IS: (STATE NAME)

THE LOCATION OF THE EMERGENCY IS: GFL 203 AEROTECH DRIVE, NS AND THE DIRECTIONS ARE:

THE PROBLEM IS (person hurt, fire, explosion)

WE REQUIRE (air ambulance, ambulance, fire equipment etc.)

THE PHONE NUMBER HERE IS (902) 835-9095

2.2 Incident Level and Communication

Level One Incidents

- Injury/ Illness – Non-first aid with extremely low likelihood of ongoing concern, non-occupational
- Environment/ Spill – Non-reportable spill of non-toxic substance (<5 L)
- Property/ Equipment Damage – Damage not involving 3rd party, <$50
- Motor Vehicle Incident – Incident not involving 3rd party, <$50

For Level One incidents, the Regional EHS Manager or delegates receives these automatically through the SEMS (Enablon) platform or by email. They will determine if additional communication to the organization is required and the extent and method of that communication. The supervisor of the employee involved in the incident must be notified.

Level Two Incidents

- Injury/ Illness – Non-first aid unlikely to have ongoing concern
- Environment/ Spill – Non-reportable spill of non-toxic substance (<50 L)
- Property/ Equipment Damage – Damage not involving 3rd party, <$500
- Motor Vehicle Incident – Incident not involving 3rd party, <$500
- Fire/ Explosion – Minor, localized, short fire/scorching, little damage, <$500

For Level Two incidents, the Regional EHS Manager or delegates receives these automatically through the SEMS (Enablon) platform or by email. They will determine if additional communication to the organization is required and the extent and method of that communication. The supervisor and the facility manager must be informed of Level Two incidents. The manager may be informed of Level Two incidents through a supervisor's weekly report or something similar.

Level Three Incidents

- Injury/ Illness – First aid injury
- Environment/ Spill – Non-reportable spill of non-toxic substance (<500 L)
- Property/ Equipment Damage – Damage involving 3rd party and/or <$5,000
- Motor Vehicle Incident – Incident involving 3rd party and/or <$5,000
- Fire/ Explosion – Localized, short fire/scorching, damage <$5,000

For Level Three incidents, the Regional EHS Manager or delegate, supervisor and facility manager where the incident occurred or who oversees the employee(s) involved in the incident must be immediately notified. The Regional Vice President must be notified as soon as possible.

Level Four Incidents

- Injury/ Illness – Medical aid incident, incident likely to result in lost time
- Environment/ Spill – Reportable incident with low likelihood of spread offsite
- Property/ Equipment Damage – Damage involving 3rd party and/or >$5,000
- Motor Vehicle Incident – Incident involving 3rd party and/or <$50,000
- Fire/ Explosion – Extensive fire/scorching, significant smoke, <$50,000

For Level Four incidents, Level Three reporting as outlined above must be carried out. In addition, the Regional Vice President, Vice President and Legal must be immediately notified of the incident and they will determine if additional communication to the organization is required and the extent and method of that communication.

Level Five Incidents

- Injury/ Illness – Significant bodily harm requiring urgent medical care, fatality
- Environment/ Spill – Reportable incident with spread offsite, large volumes
- Property/ Equipment Damage – Multiple 3rd party damage, destruction of equipment, >$5,000
- Motor Vehicle Incident – Multiple 3rd party damage, DOT reportable incident, >$50,000
- Fire/ Explosion – Catastrophic fire, long lasting smoke, >$50,000

For Level Five incidents, Level Four reporting as outlined above must be carried out. In addition, Executive Management and the CEO must be immediately notified of the incident, and they will determine if additional communication to the organization is required and the extent and method of that communication.

2.3 GFL Management Contacts

Troy Canning	District Manager	Office (902) 838-9095 Cell (902) 266-9930
Ian Marr	General Manager, Field Services	Office (506) 693-9967 Cell (506) 651-2223
Jordan Poste	Regional Vice President, Liquids Atlantic	Office (902) 468-9011 Cell (902) 266-7113
Ruth L. Uy	Vice President, Health and Safety	Office (647) 505-3127
Brian Hillier	Vice President, Environment and Compliance	Office (877) 244-9500 Cell (639) 571-1404
Darlene Whelan	EH&S Manager, Liquids Atlantic	Office (902) 468-9011 Cell (902) 237-9558
Jasna Krstic	Environmental Affairs Advisor, Liquids Atlantic	Office (902) 468-9011 Cell (902) 802-8007
24 Hour Emergency		(902) 468-9011

2.4 Emergency Authorities Contacts

RCMP	HRM	911
Fire Department	HRM	911
Ambulance	HRM	911
Hospital	HRM	(902) 465-8300
Poison Control Central	HRM	(902) 428-8161
NS Environment and Climate Change	HRM	(902) 424-7773 1-800-565-1633
Department of Transportation	HRM	(902) 424-2297
NS OH&S	HRM	1-800-952-2687
Worker Compensation Board	HRM	1-800-870-3331
Canadian Coast Guard	HRM	1-800-565-1633
Halifax Water	HRM	902-420-9287

2.5 Provincial Authorities Contacts

Nova Scotia

Environmental Emergencies	1-800-565-1633
Department of Environment and Climate Change	1-877-936-8476
Department of Labour	1-800-952-2687
Department of Transportation	1-888-432-3233
Emergency Measures Organization	1-866-424-5620
Poison Control Centre	1-800-565-8161
WorkSafe NS	1-866-415-8690

Federal Authorities

CANUTEC	(613) 996-6666

CANUTEC is the **Canadian Transport Emergency Centre** operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies. This national bilingual advisory centre has the mandate to regulate the handling, offering for transport and the transport of dangerous goods by all modes in order to ensure public safety. CANUTEC has set up a scientific data bank on chemicals manufactured, stored and transported in Canada and is staffed by professional scientists specialized in emergency response and experienced in interpreting technical information and providing advice and recommend actions to be taken and those to avoid in dangerous goods emergencies. CANUTEC staff does not go to the site of an incident. Advice and information are provided by telephone. CANUTEC can also provide communication links with the appropriate industry, government or medical specialists.

3. CONTACT NAMES OF EMPLOYEES AT FACILITY

The full list of employees, emergency contacts and phone numbers is available at the facility.

Employee	Emergency Contact Name	Phone Number	Alternate Contact Name	Phone Number

4. PUBLIC/MEDIA AFFAIRS

The Public Affairs/Media Liaison Contacts for GFL are:

Jordan Poste	Regional Vice President, Liquids Atlantic	Office (902) 468-9011 Cell (902) 266-7113
Ruth L. Uy	Vice President, Health and Safety	Office (647) 505-3127
Brian Hillier	Vice President, Environment and Compliance	Office (877) 244-9500 Cell (639) 571-1404

5. HAZARD ASSESSMENT

The facility has been designed to minimize any potential hazards that have been identified in its daily procedures. All reasonable and practical measures have been introduced to control these potential hazards and prevent releases.

5.1 Dangerous and Non-Dangerous Goods

Material**	Max. Release Quantity*	Maximum Storage Capacity
Waste Dangerous and Non-Dangerous Goods Storage Facility		
Class 2	100 lb	10,000 L
Class 3	205 L	82,000 L
Class 4	205 L	10,250 L
Class 5	205 L	10,250 L
Class 6.1	205 L	15,375 L
Class 8	205 L	41,000 L
Class 9 except PCBs and Asbestos	205 L	10,250 L
Treated wastewater	35,000 L	70,000 L
Vacuum truck sludge clean out, waste oil, rags	205 L	45,000 kg
Note: We expect majority of containers to be 205 L drums; however, from time to time a 1,000 L tote can be used.		
Chemical Storage Area		
Class 3	205 L	205 L
Class 5.1	20 L	300 L
	25 kg	500 kg
Class 8	205 L	2,000 L
	2 kg	20 kg
Class 9	20 L	100 L
Tank Farm		
Used Oil	90,000 L	1,080,000 L
Class 3	90,000 L	360,000 L
Non-Dangerous Goods – Site Water Management/Wastewater/Oily Water	90,000 L	400,000 L
Wastewater / Glycol	90,000 L	180,000 L
Non-Hazardous Material – Wastewater Concentrate	79,494 L	80,000 L
Bulk Solids Pits		
Non-hazardous material – Oily / Non-oily solids	N/A	90,000 kg

*Maximum release quantity is based upon anticipated failure of largest single container.

** Materials and volumes are not fully inclusive of water treatment equipment/storage under a separate approval

Storage areas associated with facility operations are identified in the Facility Site Plan (Appendix 2).

Safety Data Sheets (SDS) for all dangerous goods stored on-site will be maintained at the designated storage area with the material being stored.

Incompatible materials will be segregated in the storage area and will not be loaded or unloaded in the receiving area at the same time. Incompatible materials will be segregated using individual spill pallets or other means of separate secondary containment (i.e., dedicated sumps for compatible materials).

Examples of incompatible materials to be kept separate include:

- Flammables and oxidizers
- Acids and bases
- Water-reactive and aqueous solutions
- Others will be assessed on an as needed basis based on the SDS for the material

5.2 Handling and Release Prevention of Liquids and Solids

All dangerous and non-dangerous goods will be handled and managed in a way that prevents release. The following requirements will be followed:

- Container Management
    - All dangerous goods containers will be in good condition and compatible with the materials stored within.
    - All dangerous goods containers will be accessible, and spacing between containers will provide sufficient access to perform periodic inspections and respond to releases.
    - Empty containers will have all markers and labels removed.
    - Any spills on the exterior of the container will be cleaned immediately.
    - All containers will be stored upright and kept off the floor.
- Container Integrity

  Each container will be inspected before loading to ensure it is of good integrity. A visual inspection is to be completed, which includes but is not limited to checking:

    - Open top containers (drums/pails) have lids in place that fit properly, are properly secured (closed), and gaskets are complete and in place where necessary.
    - All containers (drums/pails/totes) are fully inspected to ensure there are no holes, punctures, or other damage to the container that could result in a spill.
    - All containers (drums/pails/totes) are fully inspected for visible rust or weakening of the exterior that could rupture/break during transport and result in a spill.

  If a container is found to be of poor or questionable integrity during the inspection, it will be either re-packaged into another container of good integrity or left for pick up at an alternate time when necessary, packaging/equipment can be supplied to ensure the material does not/cannot spill.

- Good Housekeeping
    - All containers will be closed.
    - All containers will be stored upright and kept off the floor. All products and dangerous goods will be stored in accordance with manufacturers' specifications.
    - Sufficient aisle space will be provided between containers/drums to allow the unobstructed movement of people, transfer equipment, fire protection equipment, and spill control equipment.
    - All small spills or leaks will be immediately cleaned up and properly managed.
    - Storage areas will be periodically inspected to ensure leaks or spills are not occurring.
    - Signage will be used to identify dangerous goods storage areas.
    - All work areas and storage areas must be kept clean and in good general condition.

- Secondary Containment
    - All containerized dangerous goods will be stored within appropriate secondary containment.
    - Secondary containment will be checked periodically. Any spills identified in secondary containment will be immediately cleaned up and removed.
    - If excessive precipitation events are forecast to occur, GFL will enact flood prevention measures to ensure that all containment areas that are uncovered (i.e., tank farm berms) do not accumulate and overflow with precipitation. Through the use of onsite storage tanks, GFL will pump containment areas to tanks, sample and then determine course of action for the accumulated precipitation. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.
- Emergency Shut-Off Valve
    - Upgrades to the exterior site grading will be carried out as part of the work, ensuring that the operations yard is graded towards new exterior stormwater catch basins, where possible. During upgrades to the stormwater infrastructure, an emergency shut off valve and dedicated pump out control device will be installed in on the stormwater discharge pipe so that any spill events that happen in travel ways can be controlled. Flow into this “closed system” will be monitored during any closure of the valve and accumulated water pumped to storage tanks onsite. This water will be sampled, treated and discharged through means approved in the existing water treatment approval or shipped offsite to an approved disposal facility.
- Marking/Labeling
    - All storage areas, containers, and tanks containing products or dangerous goods will be labeled to clearly identify their contents.
- Loading and Securing
    - Incompatible dangerous goods shall not be loaded or unloaded in the receiving area at the same time.
    - Proper segregation of any incompatible materials will be in place.

Company policy mandates that only fully trained and certified operators may operate forklift equipment. Skilled operators further reduce the potential for an incident occurring during loading/unloading procedures. Forklift operators will be certified. All employees directly involved with the drum handling operations will be TDG certified.

5.3 Handling and Release Prevention of Compressed Gases

Oxygen cylinders, full or empty, shall not be stored in the same vicinity as flammable gases. The proper storage for oxygen cylinders requires that a minimum of 15 meters be maintained between flammable gas cylinders and oxygen cylinders, or the storage areas be separated, at a minimum, by a firewall 1.5 meters high with a fire rating of 0.5 hours. Greasy and oily materials shall never be stored around oxygen, nor will oil or grease be applied to fittings. Where the possibility of flow reversal exists, the cylinder discharge lines will be equipped with approved check valves to prevent inadvertent contamination of cylinders connected to a closed system. “Sucking back” is particularly troublesome where gases are used as reactants in a closed system. A cylinder in such a system will be shut off and removed from the system when the pressure remaining in the cylinder is at least 172 kPa. If there is a possibility that the container has been contaminated it, will be labeled and returned to the supplier. The cylinders that contain compressed gases are primarily shipping containers and will not be subjected to rough handling or abuse. Such misuse can seriously weaken the cylinder and render it unfit for further use or transform it into a rocket having sufficient thrust to drive it through masonry walls.

- To protect the valve during transportation, the cover cap will be screwed on hand tight and remain on until the cylinder is in place and ready for use.
- Cylinders will never be rolled or dragged.

- When moving large cylinders, they will be strapped to a properly designed wheeled cart to ensure stability.
- Only one cylinder will be handled (moved) at a time.
- Placards are required when transporting compressed gas cylinders.
- Designated operational areas for de-packing and repacking of waste that will potentially emit hazardous vapours will be equipped with suitable ventilation as per *NS Occupational Health and Safety Regulations* and *National Building Code*, where applicable.

5.4 Worst-Case Incident

5.4.1 Liquids and/or Solids Releases

The risk of spills from leaking containers is minimal since all containers will be visually inspected before being picked up by the driver and delivered to the GFL facility. Any containers in a questionable condition will be rejected, and the materials transferred into another container that is in a condition suitable for transport or an “over-pack salvage container” will be used. Upon receipt at the facility, all transportation containers will be immediately inspected again. If any transportation containers are found to be in a questionable condition, they will be placed in over-pack containers or immediately have contents transferred to an approved container.

Should a drum rupture occur, it might cause all the contents to leak out; the spill would be less than 205 L. If during the loading process, an entire pallet was damaged or dropped, the maximum volume of the resulting spill would be 820 L or 1,000 L if a container is a tote.

In the event of a tank leak within the tank farm, the spill could be up to a maximum of 90,000 L. If such a spill occurred, it would be contained within the berm located in the tank farm. Spilled product, along with wash water generated through cleanup, would be pumped into other tanks within the tank farm, based on available capacity. If available capacity is insufficient to store all spilled product and wash water, the remaining volume will be transported off-site for disposal at an approved facility.

All loading and unloading of bulk tanker trucks and vacuum trucks will occur in a contained area on the concrete pad adjacent to the tank farm lot. In the event of a release in this contained area during loading/unloading the situation will be safely isolated, contained and spill response will be conducted immediately using onsite equipment and personnel. Temporary containment will be placed under valves prior to bulk loading and unloading activities to prevent any potential release at the point of loading/unloading.

Loading/unloading of containerized waste will occur in containment (bermed loading docks) to prevent any releases to the environment.

During loading/unloading activities, the transfer of bulk and containerized materials will be continuously monitored to further prevent releases.

5.4.2 Mixing of Incompatible Materials and Vapor Releases

The risk of mixing incompatible materials and vapor releases is minimal since dangerous goods will be segregated in storage and handling to prevent the mixing of incompatible materials if a spill were to occur. Incompatible materials will not be loaded or unloaded in the receiving area at the same time. All dangerous goods that are accepted by the facility will be stored in drums/containers composed of materials that are compatible with the goods stored therein. Specific materials posing a compatibility hazard will be stored in contained locations with separate and distinct containment sumps so incompatible materials will never comingle in the event of a release.

Should a release occur causing an incompatible materials reaction, the Emergency Response Plan shall be initiated immediately. Emergency evacuation of the area may be required if the chemical reaction causes a release of vapors. The chemical reactions leading to the generation of vapors

may cause a hazardous atmosphere in enclosed areas. Air monitoring and gas testing will be completed to evaluate the hazard before entering the area for clean-up. When it is safe to do so, the spread of liquids will be controlled by existing containments and/or additional spill response measures such as containment booms or floor dry. Acids and bases will be neutralized with spill response reagents onsite, clean-up residues will be collected and disposed of, and the affected area and equipment will be fully decontaminated in accordance with environmental hazards.

If H_2S is encountered while processing the delivery of the product at the tank farm, the product will not be accepted until it has been treated. Gas monitors are used to ensure H_2S levels are within allowable limits. If higher than expected levels are encountered, activity is shut down, the area is ventilated, and the product containing H_2S is isolated. The product will either be treated or transported to an approved facility for disposal.

5.5 Types of Emergencies

This Contingency and Emergency Response Plan addresses the following emergencies that might reasonably be expected to occur, both on-site and off-site, based on the dangerous goods handled and the daily activities conducted.

- Product spills on-site during loading/unloading
- Product spills inside the drum/container storage and tank storage structures
- Losses due to containment failure
- Fire and/or explosion
- Injury
- H_2S or gas release
- Property damage
- Natural disasters
- Bomb threat.

5.6 Environmental Effects Assessment and Mitigation Measures

TANK FARM			
Aspect	**Potential Adverse Effects**	**Mitigation Measures**	**Probability**
Fire / Explosion	Air contamination. Discharge point: area source. Soil and water contamination - particulate deposits, fire suppression runoff. Discharge points: Soil/Groundwater – any areas not covered with asphalt/concrete. Surface water – on-site drainage system.	Safe grounding and bonding procedures are implemented. Fire extinguishers are placed throughout the tank farm and readily accessible in the event of a fire. All fire extinguishers are properly maintained and regularly inspected. Personnel entering or working in the tank farm will wear personal monitors, as required to detect and respond appropriately to potential releases. Smoking is allowed only in the designated smoking area located at the NE corner of the property. Safe work permits, including Hot work permits, must be issued for any activity that falls outside of normal operating procedures. Good housekeeping.	After mitigation measures are implemented, the probability is expected to be low.

H_2S release	Low concentrations irritate the eyes, nose, throat, and respiratory system. Asthmatics may experience breathing difficulties. Moderate concentrations can cause more severe eye and respiratory irritation, headaches, dizziness, nausea, vomiting, staggering, and excitability. Discharge point: area source.	The product will be tested at the source to determine if H_2S is present. If H_2S is present, it will be treated with H_2S scavenger. The product will not be accepted until it has been treated. If the product cannot be treated, it will be transported to an approved facility for disposal. Personnel offloading into the tank farm will be equipped with personal monitors to detect and effectively respond to the potential exposure of H2S. All workers in the tank farm wear personal gas detectors.	After mitigation measures are implemented, the probability is expected to be low.
Spill/leak	Surface water and/or groundwater contamination. Discharge points: Groundwater – any areas not covered with asphalt/concrete. Surface water – on-site drainage system.	Any spill or leak within the tank farm would be contained within the berm located in the tank farm. Spilled product, along with wash water generated through clean up would be pumped into other tanks within the tank farm or transported off-site for disposal at an approved facility.	After mitigation measures are implemented, the probability is expected to be low.
DANGEROUS GOODS UNLOADING/LOADING			
Aspect	**Potential Adverse Effects**	**Mitigation Measures**	**Probability**
Fire / Explosion	Air contamination. Discharge point: area source. Soil and water contamination - particulate deposits, fire suppression runoff. Discharge points: Soil/Groundwater – any areas not covered with asphalt/concrete. Surface water – on-site drainage system.	No smoking at any time around the truck or unloading/loading area.	After mitigation measures are implemented, the probability is expected to be low.

Vapor release	Toxic vapors may cause serious health problems. Vapors from flammable liquids/solids may form explosive mixtures with air. Discharge point: area source.	Incompatible dangerous goods shall not be loaded or unloaded in the receiving area at the same time. Incompatible materials shall not share piping, valves, pumps or other means of transfer unless the transfer system is cleaned and purged between uses. There will be suitable space for material segregation. All dangerous goods containers will be in good condition. Each container will be inspected before loading to ensure there are no holes, punctures, or other damage to the container, no visible signs of rust or weakening of the exterior, and if open-top containers - properly closed.	After mitigation measures are implemented, the probability is expected to be low.
Spill/leak	Surface water and/or groundwater contamination. Discharge points: Groundwater – any areas not covered with asphalt/concrete. Surface water – on-site drainage system.	All dangerous goods containers will be in good condition. Each container will be inspected prior to loading to ensure there are no holes, punctures, or other damage to the container, no visible signs of rust or weakening of the exterior and, if open-top containers - properly closed. Only fully trained and certified operators may operate forklift equipment.	After mitigation measures are implemented, the probability is expected to be low.

DANGEROUS GOODS STORAGE			
Aspect	**Potential Adverse Effects**	**Mitigation Measures**	**Probability**
Fire / Explosion	Air contamination. Discharge point: area source. Soil and water contamination - particulate deposits, fire suppression runoff. Discharge points: Soil/Groundwater – any areas not covered with asphalt/concrete. Surface water – on-site drainage system.	Only intrinsically safe & non-sparking tools & equipment will be used in designated areas of the storage facility. Good housekeeping. All containers containing products or DG will be labeled to clearly identify their contents. Proper segregation of any incompatible materials will be in place. Fire extinguishers are placed throughout the storage facility and readily accessible in the event of a fire. All fire extinguishers are properly maintained and regularly inspected. Smoking is allowed only in a designated smoking area located at the NE corner of the property. Safe work permits, including Hot work permits, must be issued for any activity that falls outside of normal operating procedures. Building equipped with suitable fire suppression systems to prevent against loss in the event of a fire.	After mitigation measures are implemented, the probability is expected to be low.
Vapor release	Toxic vapors may cause serious health problems. Vapors from flammable liquids/solids may form explosive mixtures with air. Discharge point: area source.	All DG containers will be compatible with the materials stored within. Proper segregation of any incompatible materials will be in place. All DG containers will be in good condition and accessible when in storage to allow periodic inspections and timely response to potential releases. All containers will be closed and stored upright, and kept off the floor. Containers are not to be overfilled; headspace must remain to allow for expansion. All products will be stored in accordance with the manufacturers' specifications. Designated operational areas for de-packing and repacking of waste that will potentially emit hazardous vapours will be equipped with suitable ventilation as per *NS Occupational Health and Safety Regulations* and *National Building Code*, where applicable.	After mitigation measures are implemented, the probability is expected to be low.

Spill/leak	Surface water and/or groundwater contamination. Discharge points: Groundwater – any areas not covered with asphalt/concrete. Surface water – on-site drainage system.	All DG containers will be in good condition & accessible when in storage to allow periodic inspections & timely response to potential releases. All containers will be closed and stored upright and kept off the floor. Containers are not to be overfilled; headspace must remain to allow for expansion. All products will be stored in accordance with the manufacturers' specifications. Sufficient aisle space will be provided between containers/drums to allow the unobstructed movement of people, transfer equipment, spill control, and fire protection equipment. All containerized DG will be stored within appropriate secondary containment. Secondary containment will be checked periodically. Any spills will be immediately cleaned up. All small spills/leaks, or any spills on the exterior of the container, will be cleaned immediately.	After mitigation measures are implemented, the probability is expected to be low.

6. EMERGENCY ASSESSMENT AND NOTIFICATION PROCEDURES

GFL Environmental Services Inc.'s policies regarding releases, fire, and injury are to limit damage to people, environment, and property to the fullest extent possible. Given these policies, emergencies will be declared if any of the following occur:

- A major leak or spill
- Fire or explosion
- Serious injury or loss of life
- Major H_2S release.

Minor incidents typically involve incidents where no danger exists outside of company property and where the situation can be handled entirely by GFL personnel.

Major incidents usually involve situations where safe operating control has been lost, resulting in or potentially resulting in fatalities, serious injury to GFL personnel, contractors, or the public, serious property damage, serious impacts to the environment, or major impact to surrounding communities. Emergency response plans will require implementation.

Appropriate emergency procedures will be initiated immediately after discovery that an emergency exists.

The main person responsible for dealing with any emergency will be the Site Emergency Coordinator.

In the event that the Site Emergency Coordinator is not on duty, the individual discovering the emergency will notify the next available individual on the 6.2 Site Emergency Coordinator List or Section 6.3 Crisis Communication Schedule.

Level One Incidents

- Injury/ Illness – Non-first aid with extremely low likelihood of ongoing concern, non-occupational
- Environment/ Spill – Non-reportable spill of non-toxic substance (<5 L)
- Property/ Equipment Damage – Damage not involving 3rd party, <$50
- Motor Vehicle Incident – Incident not involving 3rd party, <$50

For Level One incidents, the Regional EHS Manager or delegates receives these automatically through the SEMS (Enablon) platform or by email. They will determine if additional communication to the organization is required and the extent and method of that communication. The supervisor of the employee involved in the incident must be notified.

Level Two Incidents

- Injury/ Illness – Non-first aid unlikely to have ongoing concern
- Environment/ Spill – Non-reportable spill of non-toxic substance (<50 L)
- Property/ Equipment Damage – Damage not involving 3rd party, <$500
- Motor Vehicle Incident – Incident not involving 3rd party, <$500
- Fire/ Explosion – Minor, localized, short fire/scorching, little damage, <$500

For Level Two incidents, the Regional EHS Manager or delegates receives these automatically through the SEMS (Enablon) platform or by email. They will determine if additional communication to the organization is required and the extent and method of that communication. The supervisor and the facility manager must be informed of Level Two incidents. The manager may be informed of Level Two incidents through a supervisor's weekly report or something similar.

Level Three Incidents

- Injury/ Illness – First aid injury
- Environment/ Spill – Non-reportable spill of non-toxic substance (<500 L)
- Property/ Equipment Damage – Damage involving 3rd party and/or <$5,000
- Motor Vehicle Incident – Incident involving 3rd party and/or <$5,000
- Fire/ Explosion – Localized, short fire/scorching, damage <$5,000

For Level Three incidents, the Regional EHS Manager or delegate, supervisor and facility manager where the incident occurred or who oversees the employee(s) involved in the incident must be immediately notified. The Regional Vice President must be notified as soon as possible.

Level Four Incidents

- Injury/ Illness – Medical aid incident, incident likely to result in lost time
- Environment/ Spill – Reportable incident with low likelihood of spread offsite
- Property/ Equipment Damage – Damage involving 3rd party and/or >$5,000
- Motor Vehicle Incident – Incident involving 3rd party and/or <$50,000
- Fire/ Explosion – Extensive fire/scorching, significant smoke, <$50,000

For Level Four incidents, Level Three reporting as outlined above must be carried out. In addition, the Regional Vice President, Vice President and Legal must be immediately notified of the incident and they will determine if additional communication to the organization is required and the extent and method of that communication.

Level Five Incidents

- Injury/ Illness – Significant bodily harm requiring urgent medical care, fatality
- Environment/ Spill – Reportable incident with spread offsite, large volumes
- Property/ Equipment Damage – Multiple 3rd party damage, destruction of equipment, >$5,000
- Motor Vehicle Incident – Multiple 3rd party damage, DOT reportable incident, >$50,000
- Fire/ Explosion – Catastrophic fire, long lasting smoke, >$50,000

For Level Five incidents, Level Four reporting as outlined above must be carried out. In addition, Executive Management and the CEO must be immediately notified of the incident, and they will determine if additional communication to the organization is required and the extent and method of that communication.

Appropriate emergency procedures will be initiated immediately after discovery that an emergency exists.

This Plan is a facility-specific plan for dealing with emergencies and shall be immediately implemented whenever there is a fire, explosion, release of a hazardous substance that threatens human health or the environment, or any other emergency situation requiring action.

6.1 Call Out for Level Four and Five Incidents

ERP Call-Out for Level Four and Five Incidents

INCIDENT HAPPENS
ERP INITIATED

Facility Personnel

Ops Manager: Russell Campbell
Cell: (902) 579-0749
Office: (902) 835-9095
Admin Assist: (902) 835-9095

District Manager: Troy Canning
Cell: (902) 266-9930
Office: (902) 835-9095
Admin Assist: (902) 835-9095

Regional VP: Jordan Poste
Cell: (902) 266-7113
Office: (902) 468-9011
Admin Assist: (902) 468-9011

Vice President, Environment & Compliance:
Brian Hillier
Cell: (639) 571-1404
Office: (877) 244-9500

Vice President, Health & Safety: Ruth L. Uy
Office: (647) 505-3127
Admin Asst: Jennifer Paquette (905) 315-2261

Senior Vice President:
Brad Dlouhy
Cell: (403) 620-7227
Other Executives as needed

Operators/Managers: If you do not talk DIRECTLY to the person identified at ANY of the contact numbers listed for them, leave messages, call back and ask for the manager's administrative assistant (listed in each box) and have the administrative assistant track the manager down. Identify that it is a level Four/Five emergency.

If the manager's location is still unknown or you do not talk to them, proceed to the next contact on the list.

NOTE: Calls to others (District Manager, Regional Manager, and EHS Advisor, EHS Manager) are **not** part of the official call-out list but may be made after. **DO NOT CALL THEM FIRST.**

6.2 Site Emergency Coordinator

The supervisor on the site at the time of any emergency is charged with the evaluation and immediate response to rectify the situation or activate the emergency response procedures.

In the event of the Site Emergency Coordinator leaving the site for any reason other than the end of his shift, he will notify the next available individual to assume the responsibilities of Site Emergency Coordinator.

The designated Site Emergency Coordinator for this facility is Russell Campbell, Operations Manager. If this person is not available, the Alternate Site Emergency Coordinator will be Troy Canning, District Manager, and Matt Hersey, Operations Manager.

Site Emergency Coordinator

Name: Russell Campbell
Title: Operations Manager, Waste
Cell: (902) 579-0749
Office: (902) 835-9095

Alternate Site Emergency Coordinator

Name: Troy Canning
Title: District Manager
Cell: (902) 266-9930
Office: (902) 835-9095

Alternate Site Emergency Coordinator

Name: Matt Hersey
Title: Operations Manager, Industrial Services
Office Phone Number: (902) 935-9095
Cell Phone Number: (902) 225-8844

6.3 Crisis Communication Schedule

In the event of an emergency, the Site Emergency Coordinator will notify the following people. Each person notified will discuss the situation with the person providing notice, and the two will jointly decide if the notification process shall escalate and who will be responsible for proceeding with further notification.

Russell Campbell	Operations Manager	Cell: (902) 579-0749 Office: (902) 835-9095
Jonathan Whitlock	Director, Waste	Office (902) 468-9011 Cell (902) 237-1025
Jordan Poste	Regional Vice President, Liquids Atlantic	Office (902) 468-9011 Cell (902) 266-7113
Ruth L. Uy	Vice President, Health and Safety	Office: (647) 505-3127
Brian Hillier	Vice President, Environment and Compliance	Office (877) 244-9500 Cell (639) 571-1404
Darlene Whelan	EH&S Manager, Liquids Atlantic	Office (902) 468-9011 Cell (902) 237-9558
Jasna Krstic	Environmental Affairs Advisor, Liquids Atlantic	Office (902) 468-9011 Cell (902) 802-8007

6.4 Personal Protective and Emergency Response Equipment

The following personal protective and emergency response equipment apply to each waste dangerous goods class.

- Wear a full or half-face respirator.
- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations only; it is not effective in spill situations where direct contact with the substance is possible.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.
- Wear rubber boots/chemical resistant overshoes or boots, chemical resistant gloves, and safety goggles/face shield.
- Use non-sparking hand tools, absorbent pads, brooms, and plastic dustpans.
- If the spill is large (greater than 50 L), use a mobile wash and vacuum truck.

A full list of emergency response equipment can be found in Section 13.

6.5 Resources

GFL Environmental Services Inc. specializes in chemical and hazardous waste spill response and remediation. The key response personnel consists of people with diverse technical and first response backgrounds. In addition, GFL has a large number of people available with various related skills – mechanics, vacuum truck operations, pipe fitting & cleaning, and confined space entry.

6.6 Security

The site is protected by a security alarm, fire alarm, and suppression system.

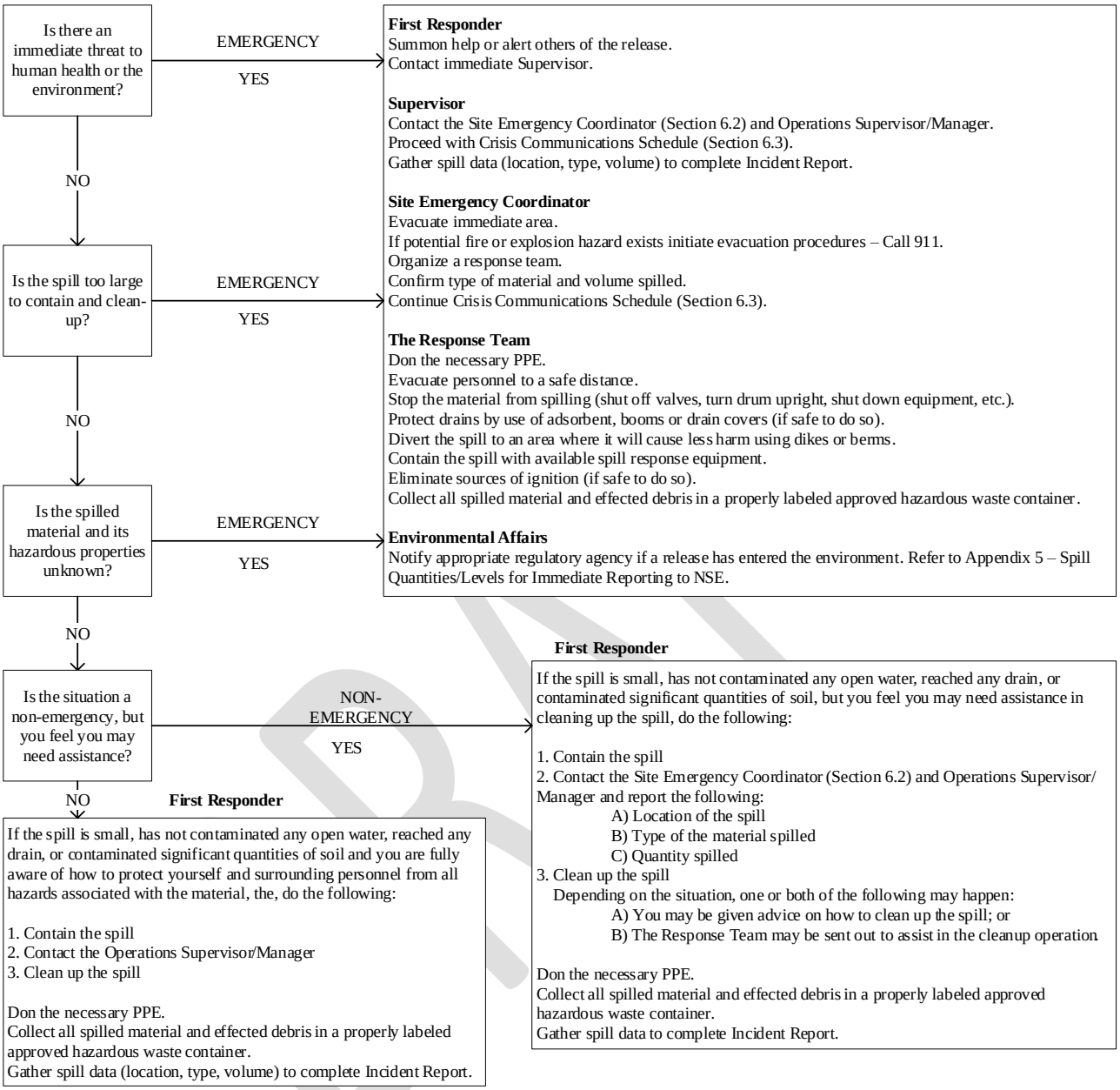
Security Alarm System

The security alarm is active whenever there are no GFL employees in the buildings or the yard. The system is to be activated by the last employee to leave the building. It is monitored by outside security, who will immediately contact the GFL office to report an incident. The GFL office will have the opportunity to declare the alarm false by giving a password and deactivating the alarm. However, if the alarm is real, the police department will be contacted immediately.

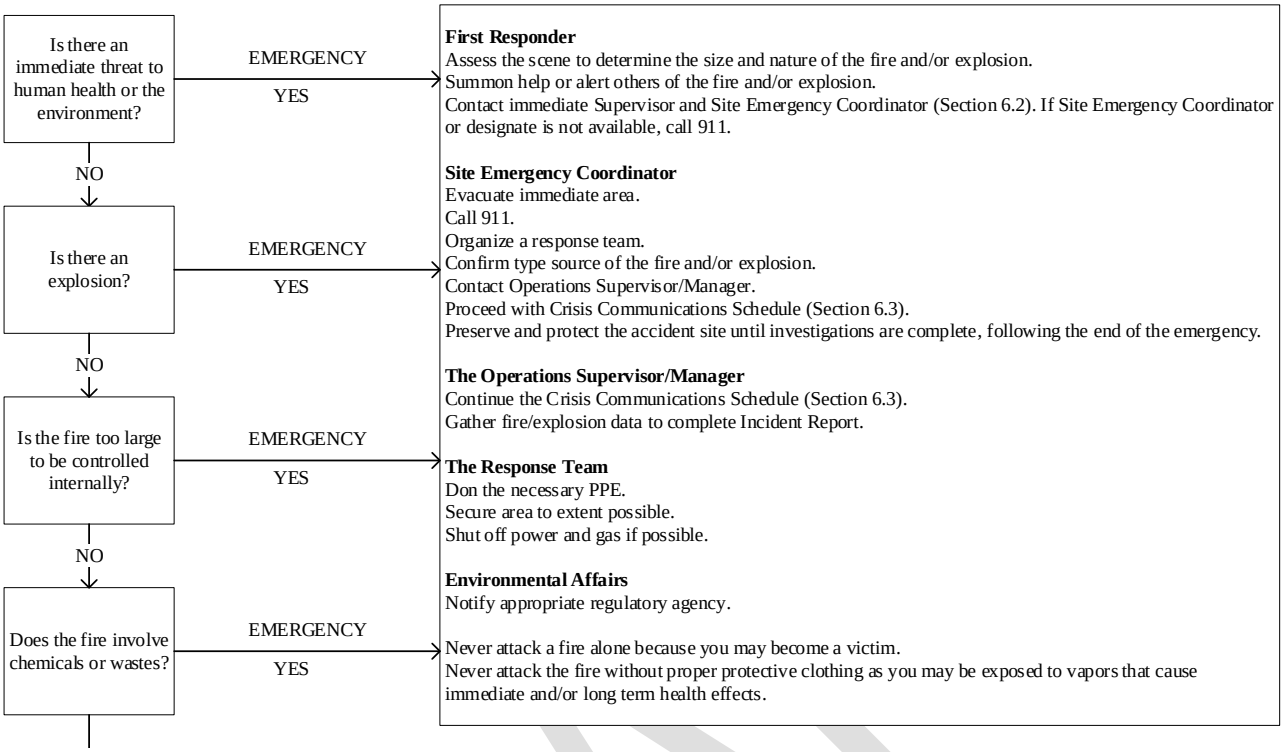
Fire Alarm and Suppression System

There is a number of fire alarm pull stations located in the office area, and waste storage areas. Upon activation, an audible alarm sounds, notifying employees to evacuate the building to the Muster Station. Upon alarming the outside security company that monitors our facility is notified, and they can request assistance from the local Fire Department.

6.7 Spill Response



6.8 Fire/Explosion Response



- A Fire hydrant is located on Aerotech Drive, across from the main entrance.

6.9 Injury Response

6.9.1 Minor Injury

Injured Person

- Report to immediate Supervisor/Site Lead.
- Apply first aid, as necessary.

Supervisor/Site Lead

- Contact Safety Advisor, HR, and Operations Supervisor/Manager.
- Help the injured person by applying first aid.
- Take the injured person to medical help, if necessary.
- Complete Incident Report.

6.9.2 Major Injury

Injured Person/Site Lead

- Report to immediate Supervisor and call 911 if needed.
- Apply first aid, as necessary.

Note: For a serious injury, contact General Manager and then Supervisor.

Supervisor

- Contact Operations Supervisor/Manager, Safety Advisor, and HR.
- Take the injured person to medical help, if necessary.
- Ensure unobstructed access for emergency response personnel to the accident site, if necessary.
- Receive and direct emergency response personnel to the accident site, if necessary.
- Preserve and protect the accident site until investigations are complete.
- Complete Incident Report.

Operations Supervisor/Manager

- Contact Crisis Communication Schedule – District Manager (section 6.3).

District Manager

- Continue the Crisis Communication Schedule (Section 6.3).
- Notify the injured person's family.

Safety Advisor

- Contact the Department of Labor, if required.

6.9.3 Fatality

Supervisor/Site Lead

- Call 911.
- Contact Senior Director, then immediate Supervisor.

Supervisor

- Contact Operations Supervisor/Manager, Safety Advisor, and HR.
- Ensure unobstructed access for emergency response personnel to the accident site.
- Receive and direct emergency response personnel to the accident site.
- Preserve and protect the accident site until investigations are complete.

- Complete Incident Report.

Operations Supervisor/Manager

- Contact Crisis Communication Schedule – District Manager (section 6.3).

District Manager

- Continue the Crisis Communication Schedule (Section 6.3).

NOTE: Authorities will notify family members.

6.10 H_2S Alarm, H_2S or Gas Release

First Responder

- Shut down all operating equipment.
- Evacuate the area and proceed to the meeting point upwind away from the hazardous area.
- Contact immediate Supervisor.

Supervisor

- Organize a Response Team.
- Proceed with Crisis Communication Schedule – contact District Manager (Section 6.3).
- Complete Incident Report.

District Manager

- Continue the Crisis Communication Schedule, if required (Section 6.3).

Response Team

- Don the necessary PPE.
- Contain a source of H_2S release.
- Assess the situation - Do a headcount and consider other hazards.

Monitor site and surrounding area outside of the accident site.

6.11 Major Property Damage

Operator

- Shut down equipment and processes in the affected area if safe to do so.
- Stay clear of the affected area.
- Contact Site Emergency Coordinator (Section 6.2).

The Site Emergency Coordinator shall:

- Organize a response team to stabilize the affected area to allow for the continued operation of the facility, if possible.
- If not possible, use lockout procedures and cordon off effected area until repair can be made.

The Operations Supervisor shall:

- Complete Incident Report.
- Contact management within 24 hours or the next working day (Section 2.3).

The Response Team shall:

- Don the necessary personal protective equipment.
- Help with stabilizing the affected area.
- Do lockout procedures and cordon off the affected area.

6.12 Natural Disasters

6.12.1 Lightning Storm

Prepare

- Shut down equipment and processes.

Action

- During an electrical storm, work activity (i.e., tank washing, tank sampling, etc.) immediately around the facility will be temporarily stopped until the danger has passed.

6.12.2 Hurricane Warning

Prepare

- Shut down equipment and processes.
- Inspect all drums inside the storage facility.
- Ensure the loading/unloading pad is empty of drums and the concrete is clean.

Action

- In the event of a publicly announced hurricane watch, facility staff is to be notified by the supervisor.
- Work activities to be conducted in recognition of short notice stoppage.
- In the event of a publicly announced hurricane warning, employees to take cover.
- Off-duty staff will not go to the plant to advise others.

6.12.3 Flood

Prepare

- Secure facility.
- Empty out/reduce tanks of oil and fill tanks with water.
- Empty sumps and underground tanks.
- Secure equipment and office equipment.
- Shut off power and gas.
- Remove/secure chemical barrels to higher levels.
- Build up a berm around the plant.

Action

- Close the gate and evacuate to the safe area.

6.12.4 Grass/Forest Fires

Prepare

- Contact the fire department to protect the plant from the fire.
- Secure facility upon warning/alert.
- Ensure no open hydrocarbons.
- Close hatches.
- Shut down equipment and processes.
- Cover and protect equipment to the extent feasible.

Action

- Evacuate employees to the nearest safe area.

6.12.5 High Winds, Hail

Prepare

- Secure light objects.
- Protect equipment.

Action

- Take cover.

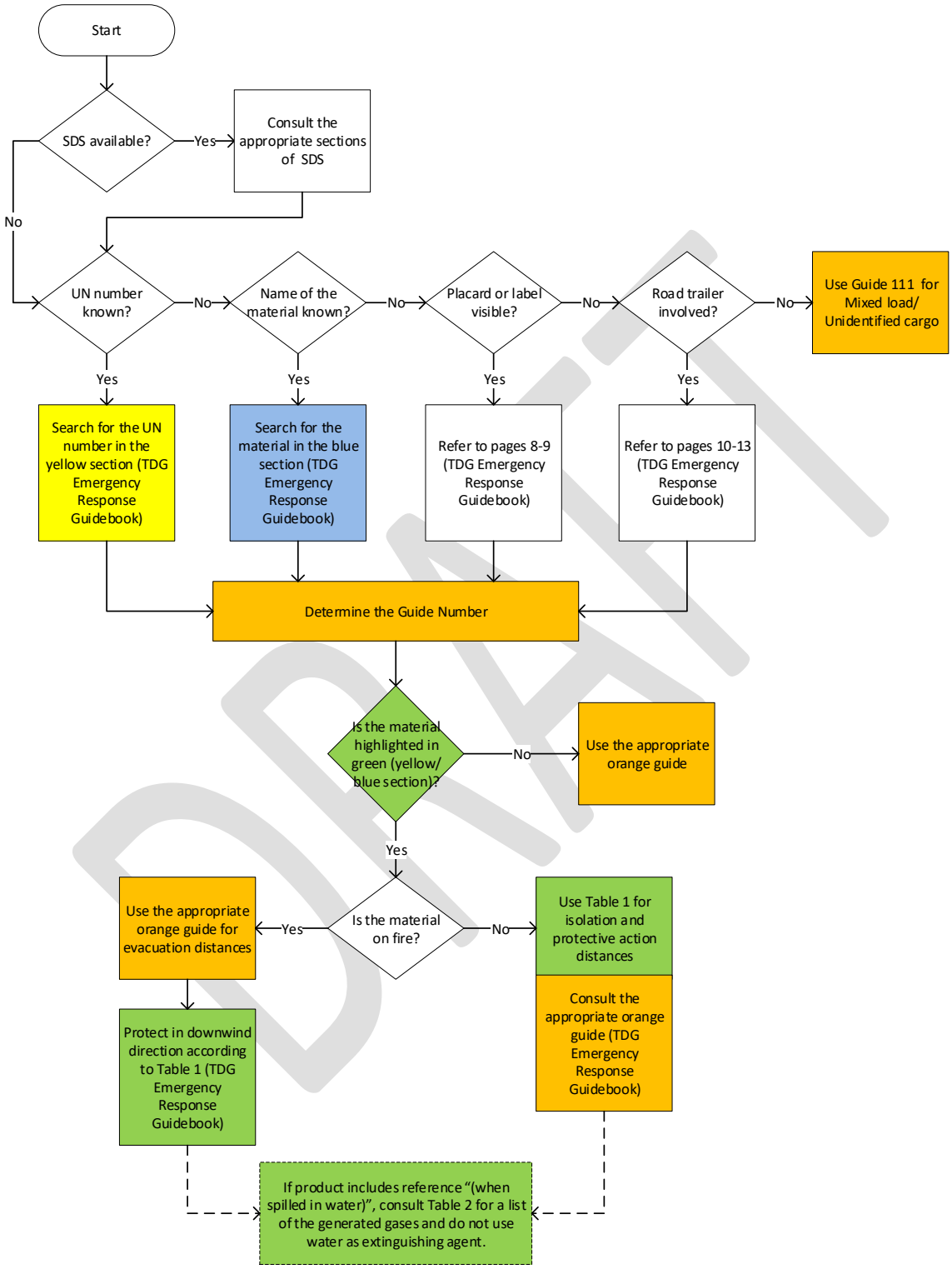
6.13 Bomb Threat

WHAT TO LISTEN FOR

When a bomb threat is received, the following will be used:

- The Operations Manager or Lead Hand (if after hours) will most likely be the only person talking to the caller. While talking to the caller, they will record:
  - Time of call
  - Male/Female caller
  - Accent in a voice
  - What was said
  - Background noises
  - Why this company is targeted
  - Who is calling
  - Caller upset/joking around
  - What time will the bomb go off
  - Any other specifics that relate to the identification of the caller.
- Immediately following the call, notify the most senior person on site. If after hours, notify one of the management team members using the GFL Management Contacts List (Section 2.3).
- Call 9-1-1 and inform the operator of the situation and the need for the Bomb Squad.
- Activate the nearest emergency plant shutdown button and begin evacuation procedures.
- When police and other responding teams arrive, assist them in any way they may require.

7. EMERGENCY RESPONSE GUIDE



7.1 Emergency Response for Class 2

Class 2 - Gases
POTENTIAL HAZARDS
Fire or Explosion
Flammable gases will be easily ignited by heat, sparks, or flames and will form explosive mixtures with air. Toxic-flammable/flammable-corrosive gases may be ignited by heat, sparks, or flames & may form explosive mixtures with air. Oxidizing gases do not burn but will support combustion & may ignite combustibles (wood, paper, oil, clothing, etc.). Some oxidizing gases may react explosively with fuels. Some toxic and/or corrosive and compressed or liquefied gases may burn, but none ignite readily. Vapors from liquefied gas are initially heavier than air, spread along the ground, and may travel to the source of ignition and flashback (if gases are flammable). Toxic and/or corrosive oxidizing gases are strong oxidizers and will react vigorously or explosively with many materials, including fuels. Toxic-flammable and oxidizing gases runoff may create fire or explosion hazards. Some flammable-corrosive, toxic-flammable, and corrosive gases may react violently with water. Some oxidizing gases will react violently with air, moist air, and/or water. Cylinders exposed to fire may vent and release toxic, flammable and/or corrosive gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.
Health
Vapors may cause dizziness or asphyxiation without warning. Some may be toxic or irritating if inhaled at high concentrations. Some toxic, flammable, and/or corrosive gases are extremely hazardous or toxic and may be fatal if inhaled or absorbed through the skin. Initial odor (toxic-flammable gases) may be irritating or foul and may reduce your sense of smell. Flammable-corrosive gas vapors are extremely irritating and may be corrosive. Contact with gas or liquefied gas may cause burns, severe injury, and/or frostbite. Fire may produce irritating, corrosive, and/or toxic gases. Some runoff from fire control may cause pollution.
PUBLIC SAFETY
As an immediate precautionary measure, isolate spill or leak for at least 100 meters in all directions. Keep unauthorized personnel away. Stay upwind, uphill, and/or upstream. Many gases are heavier than air, will spread along the ground, and collect in low or confined areas. Ventilate closed spaces before entering. EVACUATION Large spill - Consider initial downwind evacuation for at least 100 meters (inert gases), 500 meters (oxidizing and compressed or liquefied gases), and 800 meters (flammable, flammable-corrosive gases). Spills involving vapors toxic by inhalation – Consider TDG Initial Isolation and Protective Action Distances.

EMERGENCY RESPONSE

Fire

Do not extinguish a leaking gas fire unless the leak can be stopped.
Move containers from the fire area if you can do it without risk.
Damaged cylinders should be handled only by specialists.
Do not get water inside containers.

Gases	Dry chemical	CO_2	Water spray	Fog	Regular foam	Alcohol-resistant foam
Flammable	SF - ✓	SF - ✓	LF - ✓	LF - ✓		
Flammable-corrosive	SF - ✓	SF - ✓	LF - ✓	LF - ✓	LF - ✓	
Toxic-flammable (extreme hazard)	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓	SF - ✓ LF - ✓	
Toxic-flammable	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓		SF - ✓ LF - ✓
Oxidizing gases	SF - ✓	SF - ✓	LF - ✓	LF - ✓	LF - ✓	
Toxic and/or corrosive	SF - ✓	SF - ✓	LF - ✓	LF - ✓	LF - ✓	
Toxic and/or corrosive - oxidizing	✗	✗	SF - ✓	SF - ✓		
Compressed or liquefied	SF - ✓	SF - ✓	LF - ✓	LF - ✓	LF - ✓	

SF – Small fire; LF – Large fire

Toxic and/or corrosive – oxidizing - These materials do not burn but will support combustion. Some will react violently with water. Contain fire and let burn. If fire must be fought, water spray or fog is recommended.

Inert gases - Use an extinguishing agent suitable for the type of surrounding fire.

Spill or Leak

Flammable gases - Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).
Flammable gases - All equipment used when handling the product must be grounded.
Oxidizing gases – Keep combustibles (wood, paper, oil, etc.) away from spilled material.
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
Do not direct water to spill or source of the leak.
Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
If possible, turn the leaking containers so that gas escapes rather than liquid.
Prevent entry into waterways and sewers.
Isolate the area until gas has dispersed.
Ventilate the area.

First Aid

Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.
Move a victim to fresh air.
Call 911 or emergency medical services.
Give artificial respiration if the victim is not breathing.
Toxic-flammable, flammable-corrosive, toxic, and/or corrosive gases – Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Administer oxygen if breathing is difficult. Remove and isolate contaminated clothing and shoes. Clothing frozen to the skin should be thawed before being removed. In case of contact with toxic-flammable gas, immediately flush the skin and eyes with running water for at least 20 minutes. In case of contact with liquefied gas, thaw frosted parts with lukewarm water. In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to the skin. Keep the victim calm and warm and under observation. Effect of contact or inhalation may be delayed.

7.2 Emergency Response for Class 3

Class 3 – Flammable Liquids
POTENTIAL HAZARDS
Fire or Explosion
Highly flammable – Will be easily ignited by heat, sparks, or flames. Vapors may form explosive mixtures with air. Vapors may travel to the source of ignition and flashback. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas. Vapor explosion and/or poison (if toxic flammable liquid) hazard indoors, outdoors, or in sewers. Runoff to the sewer may create fire or explosion hazards. Containers may explode when heated. Many liquids are lighter than water. Flammable water-immiscible liquid substances may be transported hot.
Health
Noxious flammable liquids may cause toxic effects if inhaled or absorbed through the skin. Toxic flammable liquids may be fatal if inhaled, ingested, or absorbed through the skin. Corrosive flammable liquids may cause toxic effects if inhaled or ingested/swallowed. Inhalation or contact with material may irritate or burn skin and eyes. Fire may produce irritating, corrosive, and/or toxic gases. Vapors may cause dizziness or suffocation. Runoff from the fire control or dilution water may cause pollution.
PUBLIC SAFETY
As an immediate precautionary measure, isolate the spill or leak area for at least 50 meters in all directions. Keep unauthorized personnel away. Stay upwind, uphill, and/or upstream. Ventilate closed spaces before entering. EVACUATION Large spill – Consider initial downwind evacuation for at least 300 meters.

EMERGENCY RESPONSE

Fire

All these products have a very low flash point; The use of water spray when fighting fire may be inefficient.
For fire involving alcohol, the alcohol-resistant foam should be used.
For mixtures containing alcohol or polar solvent, the alcohol-resistant foam may be more effective.
Some corrosive flammable liquid materials may react violently with water.

Flammable liquids	Dry chemical	CO_2	Water spray	Fog	Regular foam	Alcohol-resistant foam
Water-miscible Water-miscible/noxious Toxic Corrosive	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓		SF - ✓ LF - ✓
Water-immiscible Water-immiscible/noxious	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓	SF - ✓ LF - ✓	

SF – Small fire; LF – Large fire

Large fire

Do not use straight streams.
Move containers from the fire area if you can do it without risk.
Toxic and corrosive flammable liquids – Dike fire-control water for later disposal; do not scatter the material.
Corrosive flammable liquids – Do not get water inside containers.

Fire involving tanks or trailer loads

Fight fire from a maximum distance or use unmanned hose holders or monitor nozzles.
Cool containers with flooding quantities of water until well after the fire is out.
Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
Always stay away from tanks engulfed in fire.
For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from the area and let the fire burn.

Spill or Leak

Toxic and corrosive flammable liquids – Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.
Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).
All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
Stop leak if you can do it without risk.
Prevent entry into waterways, sewers, or confined areas.
A vapor-suppressing foam may be used to reduce vapors.
Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers for later disposal.
Use clean, non-sparking tools to collect absorbed material.

Large spill

Dike far ahead of liquid spill for later disposal.
Water spray may reduce vapor but may not prevent ignition in closed spaces.

First Aid
Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.
Move a victim to fresh air.
Call 911 or emergency medical services.
Give artificial respiration if the victim is not breathing.
Toxic and corrosive flammable liquids – Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Administer oxygen if breathing is difficult.
Remove and isolate contaminated clothing and shoes.
In case of contact with the substance, immediately flush the skin and eyes with running water for at least 20 minutes.
Wash the skin with soap and water.
In case of burns, immediately cool the affected skin for as long as possible with cold water. Do not remove clothing if adhering to the skin.
Keep the victim calm and warm.
Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

7.3 Emergency Response for Class 4

Class 4 - Flammable Solids; Substances Liable to Spontaneous Combustion; Substances that on Contact with Water Emit Flammable Gases (Water-Reactive Substances)
POTENTIAL HAZARDS
Fire or Explosion
Flammable/combustible material.
Self-reactive substances – Self-decomposition, self-polymerization, or self-ignition may be triggered by heat, chemical reaction, friction, or impact.
May be ignited by friction, heat, sparks, or flames.
Some may burn rapidly with a flare-burning effect.
Powders, dust, shavings, borings, turnings, or cuttings may explode or burn with explosive violence.
Substances may be transported in a molten form at a temperature that may be above its flashpoint.
May re-ignite after the fire is extinguished.
Containers may explode when heated.
Some react vigorously or explosively in contact with water.
Some may explosively decompose when heated or involved in a fire.
Toxic and/or corrosive flammable solids – When heated, vapors may form explosive mixtures with air; Contact with metals may evolve flammable hydrogen gas.
Runoff may create a fire or explosion hazard.
Spontaneously combustible - toxic and/or corrosive (air-reactive) substances – Extremely flammable; will ignite itself if exposed to air; burn rapidly, releasing dense, white, irritating fumes.
Water-reactive substances – Produce flammable (and toxic) gases in contact with water. May ignite on contact with water or moist air.
Self-reactive substances – May burn violently. Decomposition or polymerization may be self-accelerating and produce large amounts of gases.
Self-reactive/temperature-controlled substances – Self-accelerating decomposition may occur if the specific control temperature is not maintained. These materials are particularly sensitive to temperature rises. Above a given “control temperature,” they decompose or polymerize violently and may catch fire.

Water-reactive substances and metals - Some are transported in highly flammable liquids.

Self-reactive substances and metals – Vapors, dust, or fumes may form explosive mixtures with air.

Health

Toxic flammable solids – Inhalation, ingestion, or skin contact with material may cause severe injury or death.

Spontaneously combustible substances – Inhalation of decomposition products may cause severe injury or death.

Spontaneously combustible – toxic and/or corrosive (air-reactive) substances – Ingestion of substances or inhalation of decomposition products will cause severe injury or death. Some effects may be experienced due to skin absorption.

Water-reactive (emitting flammable and toxic gases) substances – Highly toxic: contact with water produces toxic gas, which may be fatal if inhaled.

Water-reactive and self-reactive substances – Inhalation or contact with vapors, substances, or decomposition products may cause severe injury or death. May produce corrosive solutions in contact with water.

Metals (powders, dust, shavings, borings, turnings, cuttings, etc.) – Oxides from metallic fires are a severe health hazard. Inhalation or contact with substance or decomposition products may cause severe injury or death.

Fire may produce irritating, corrosive, and/or toxic gases.

Contact with substance may cause burns to the skin and eyes.

Contact with molten substances may cause severe burns to the skin and eyes.

Runoff from the fire control or dilution water may be corrosive and/or toxic and cause pollution.

PUBLIC SAFETY

As an immediate precautionary measure, isolate the spill or leak area in all directions for at least 50 meters for liquids and at least 25 meters for solids.

Keep unauthorized personnel away.

Stay upwind, uphill, and/or upstream.

Ventilate the area before entering.

Self-reactive/temperature-controlled substances – Do not allow the substance to warm up. Obtain liquid nitrogen, dry ice, or ice for cooling. If this is not possible or none can be obtained, evacuate the area immediately.

EVACUATION

Large Spill

Consider initial downwind evacuation for at least 100 meters for flammable solids, 300 meters for spontaneously combustible (air-reactive) substances, 250 meters for self-reactive substances, and 50 meters for metals (dust, powders, etc.).

EMERGENCY RESPONSE

Fire

Move containers from the fire area if you can do it without risk.

Large fire

When using water spray or fog, do not use straight streams and do not get water inside containers.

Dike fire-control water for later disposal; do not scatter the material.

Spontaneously combustible – toxic and/or corrosive (air-reactive) substances – Do not scatter spilled material with high-pressure water streams.

Self-reactive substances – Flood the area with water from a distance.

Self-reactive/temperature-controlled substances – The temperature of the substance must be maintained at or below “control temperature” at all times.

Metals (powders, dust, cuttings, etc.) – Do not use water, foam, or CO_2. Dousing metallic fires with water will generate hydrogen gas, an extremely dangerous explosion hazard, particularly if the fire is in a confined environment. Use dry sand, graphite powder, dry sodium chloride-based extinguishers, G-1, or Met-L-X powder. Confining and smothering metal fires is preferable rather than applying water.

For chlorosilanes, do not use water; use AFFF alcohol-resistant medium-expansion foam; do not use dry chemicals, soda ash, or lime on chlorosilane fires as they may release large quantities of hydrogen gas that may explode.

	Dry chemical	CO_2	Soda ash	Lime	Dry sand	Wet sand/ earth	Sand, earth	Water spray	Fog	Regular foam	Alcohol-resistant foam
Flammable solids	SF - ✓	SF - ✓					SF - ✓	SF - ✓ LF - ✓	LF - ✓	SF - ✓ LF - ✓	
Flammable solids – toxic and/or corrosive	SF - ✓	SF - ✓						SF - ✓ LF - ✓	LF - ✓		SF - ✓ LF - ✓
Spontaneously combustible	SF - ✓ LF - ✓	✗	SF - ✓ LF - ✓	SF - ✓ LF - ✓	SF - ✓ LF - ✓			✗		✗	
Spontaneously combustible (air-reactive)						SF - ✓		SF - ✓ LF - ✓	LF - ✓		
Water-reactive	SF - ✓ LF - ✓		SF - ✓ LF - ✓	SF - ✓ LF - ✓	LF - ✓		SF - ✓	✗		✗	
Self-reactive	SF - ✓	SF - ✓						SF - ✓ LF - ✓		SF - ✓	
Metals		✗			SF - ✓ LF - ✓			✗		✗	

SF– Small fire; LF – Large fire

Exception - For Xanthates UN3342, Dithionite (Hydrosulfite) UN1384, UN1923, and UN1929 use flooding amounts of water from small and large fires to stop the reaction. Smothering will not work for these materials; they do not need air to burn. Caution: UN3342 - when flooded with water, it will continue to evolve flammable Carbon disulfide vapors.

Spill or Leak

Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.

Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).

Do not touch or walk through spilled material.

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Stop leak if you can do it without risk.

Prevent entry into waterways, sewers, or confined areas.

Flammable solids: Small dry spill - With a clean shovel, place material into a clean, dry container and cover loosely; move containers from the spill area. Large spill - Wet down with water and dike for later disposal.

Spontaneously combustible substances: Cover with dry earth, dry sand, or other non-combustible material, followed by a plastic sheet to minimize spreading or contact with rain. **Exception**: For spills of Xanthates UN3342, Dithionite (Hydrosulfite) UN1384, UN1923, and UN1929 dissolve in 5 parts water and collect for proper disposal. **Caution**: UN3342 - when flooded with water, it will continue to evolve flammable Carbon disulfide vapors.

Toxic and/or corrosive (air-reactive) spontaneously combustible substances: Small spill – Cover with water, sand, or earth; shovel into a metal container and keep material underwater. Large spill – Dike for later disposal and cover with wet sand or earth.

Water-reactive (emitting flammable gases) substances: Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not get water on spilled substances or inside containers. Small spill: Cover with dry earth, dry sand, or other non-combustible material followed by a plastic sheet to minimize spreading or contact with rain. Dike for later disposal; do not apply water unless directed to do so. Powder spill: Cover powder spill with a plastic sheet or tarp to minimize spreading and keep the powder dry. Do not clean up or dispose of, except under the supervision of a specialist. For chlorosilanes, use AFFF alcohol-resistant medium-expansion foam to reduce vapors.

Self-reactive substances: Pick up the material with inert, damp, non-combustible material using clean, non-sparking tools and place it into loosely covered plastic containers for later disposal. Temperature controlled substances - Do not clean up or dispose of, except under the supervision of a specialist.

First Aid

Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.

Move victim to fresh air.

Call 911 or emergency medical service.

Give artificial respiration if a victim is not breathing.

Toxic and/or corrosive flammable solids and **Water-reactive (emitting flammable and toxic gases) substances** – Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Administer oxygen if breathing is difficult.

Remove and isolate contaminated clothing and shoes.

In case of contact with a substance, immediately flush the skin or eyes with running water for at least 20 minutes.

For minor skin contact, avoid spreading material on unaffected skin.

Removal of solidified molten material from the skin requires medical assistance.

Spontaneously combustible – toxic and/or corrosive (air-reactive) substances – Remove and isolate contaminated clothing and shoes at the site and place them in a metal container filled with water. Fire hazard if allowed to dry.

Keep the victim calm and warm.

Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

7.4 Emergency Response for Class 5

Class 5 – Oxidizing Substances and Organic Peroxides

POTENTIAL HAZARDS

Fire or Explosion

These substances will accelerate burning when involved in a fire.

Some may explosively decompose when heated or involved in a fire.

May explode from heat or contamination.

Heat, contamination, and friction-sensitive organic peroxides – May explode from heat, shock, friction, or contamination.

Heat and contamination sensitive/temperature controlled organic peroxides – May explode from heat, contamination, or loss of temperature control. These materials are particularly sensitive to temperature rises. Above a given “control temperature,” they decompose violently and catch fire. May spontaneously ignite if exposed to air.

Some may burn rapidly.

Some will react explosively with hydrocarbons (fuels).

May ignite combustibles (wood, paper, oil, clothing, etc.).

Organic peroxides – May be ignited by heat, sparks, or flames. May burn rapidly with a flare-burning effect.

Water-reactive oxidizers – React vigorously and/or explosively with water. Produce toxic and/or corrosive substances in contact with water. Some may produce flammable hydrogen gas upon contact with metals.

Containers may explode when heated.

Runoff may create fire or explosion hazards.

Health

Toxic oxidizers – Toxic by ingestion. Inhalation of dust is toxic.

Inhalation, ingestion, or contact (skin, eyes) with vapors or substances may cause severe injury, burns, or death.

Fire may produce irritating, corrosive, and/or toxic gases.

Toxic (liquid) and unstable oxidizers – Toxic or flammable fumes or dust may accumulate in confined areas.

Runoff from fire control or dilution water may cause pollution.

PUBLIC SAFETY

As an immediate precautionary measure, isolate the spill or leak area in all directions for at least 50 meters for liquids and at least 25 meters for solids.

Keep unauthorized personnel away.

Stay upwind, uphill, and/or upstream.

Ventilate closed spaces before entering.

Organic peroxides (heat and contamination sensitive/temperature controlled) – Do not allow the substance to warm up. Obtain liquid nitrogen (wear thermal protective clothing), dry ice, or ice for cooling. If this is not possible or none can be obtained, evacuate the area immediately.

EVACUATION

Large spill

Consider initial downwind evacuation for at least 100 meters for oxidizers and at least 250 meters in all directions for organic peroxides.

EMERGENCY RESPONSE

Fire

Large fire

Flood area with water from a distance – all except water-reactive oxidizers.

Water-reactive oxidizers – Do not use water or foam.

Organic peroxides – Use water spray or fog; do not use straight streams.

Do not move cargo or vehicle if cargo has been exposed to heat.

Move containers from the fire area if you can do it without risk.

Unstable oxidizers – Do not get water inside containers; a violent reaction may occur.

	Dry chemical	CO_2	Water spray	Soda ash	Lime	Dry sand	Fog	Regular foam
Oxidizers	✘		SF- ✓ LF - ✓					✘
Water-reactive oxidizers	SF- ✓ LF - ✓		✘	SF- ✓ LF - ✓	SF- ✓ LF - ✓	LF - ✓		✘
Organic peroxides	SF - ✓	SF - ✓	SF- ✓ LF - ✓				SF- ✓ LF - ✓	SF - ✓

SF– Small fire; LF – Large fire

Spill or Leak

Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Do not touch or walk through spilled material.

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Stop leak if you can do it without risk.

Do not get water inside containers.

Prevent entry into waterways, sewers, or confined areas.

Toxic (liquid) oxidizers – Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire.

Toxic (liquid) and unstable oxidizers – Use water spray to reduce vapors or divert vapor cloud drift.

Water-reactive oxidizers and organic peroxides – Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).

Water-reactive oxidizers – Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not get water on spilled substances or inside containers.

Organic peroxides – Keep the substance wet using water spray.

Oxidizers - Small dry spill

With a clean shovel, place material into a clean, dry container and cover loosely; move containers from the spill area.

Oxidizers - Small liquid spill

Use a non-combustible material like vermiculite or sand to soak up the product and place it into a container for later disposal.

Oxidizers - Large spill

Dike far ahead of liquid spill for later disposal.

Following product recovery, flush the area with water.

Unstable oxidizers - Small spill

Flush the area with flooding quantities of water.

Water-reactive oxidizers - Small spill

Cover with dry earth, dry sand, or other non-combustible material followed by a plastic sheet to minimize spreading or contact with rain.

Unstable oxidizers and water-reactive oxidizers - Large spill

Do not clean up or dispose of, except under the supervision of a specialist.

Organic peroxides – Small spill

Pick up the material with inert, damp, non-combustible material using clean, non-sparking tools and place it into loosely covered plastic containers for later disposal.

Organic peroxides – Large spill

Wet down with water and dike for later disposal. Do not clean up or dispose of, except under the supervision of a specialist.

First Aid

Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.

Move a victim to fresh air.

Call 911 or emergency medical service.

Give artificial respiration if the victim is not breathing.

Toxic (liquid) and water-reactive oxidizers – Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Administer oxygen if breathing is difficult.

Remove and isolate contaminated clothing and shoes.

Contaminated clothing may be a fire risk when dry.

In case of contact with the substance, immediately flush the skin or eyes with running water for at least 20 minutes.

Keep the victim calm and warm and under observation.

Effects of contact or inhalation may be delayed.

7.5 Emergency Response for Class 6.1

Class 6.1 – Toxic Substances
POTENTIAL HAZARDS
Fire or Explosion
Toxic and/or corrosive non-combustible substances - Non-combustible substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some are oxidizers and may ignite combustibles (wood, paper, oil, etc.). **Toxic and/or corrosive combustible substances** – Combustible material may burn but does not ignite readily. Substances may be transported in a molten form. When heated, vapors may form explosive mixtures with air. **Toxic and/or corrosive (combustible, non-combustible, water-sensitive (combustible, flammable, non-combustible)) substances** – Contact with metals may evolve flammable hydrogen gas. **Toxic and/or corrosive flammable/water-sensitive substances** – Highly flammable, will be easily ignited by heat, sparks, or flames. **Toxic and/or corrosive water-sensitive (flammable and combustible) substances –** Vapors form explosive mixtures with air. Most vapors are heavier than air. They spread along the ground and collect in low or confined areas. Vapors may travel to the source of ignition and flashback. **Toxic and/or corrosive water-sensitive (flammable, combustible, and non-combustible) substances** – Substances will react with water (some violently), releasing flammable, toxic, and/or corrosive gases and runoff. Containers may explode when heated or contaminated with water (water-sensitive substances). Runoff may pollute waterways.
Health
Highly toxic; inhalation, ingestion, or contact (skin, eyes) with vapors, dust, or substance may cause severe injury, burns, or death. **Toxic and/or corrosive combustible and non-combustible substances** – Contact with molten substances may cause severe burns to the skin and eyes. **Toxic and/or corrosive water-sensitive (flammable, combustible, and non-combustible) substances** – Reaction with water or moist air will release toxic, corrosive, or flammable gases. Reaction with water may generate a lot of heat that will increase the concentration of fumes in the air. Avoid any skin contact. Effects of contact or inhalation may be delayed. Fire may produce irritating, corrosive, and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.
PUBLIC SAFETY
As an immediate precautionary measure, isolate the spill or leak area in all directions for at least 50 meters for liquids and at least 25 meters for solids. Keep unauthorized personnel away. Stay upwind, uphill, and/or upstream. Ventilate enclosed areas. EVACUATION <u>Spill</u> Increase, in the downwind direction, as necessary, the isolation distance - at least 50 meters for liquids and at least 25 meters for solids. <u>Sodium cyanide (when spilled in water)</u>

Small spills			Large spills		
First isolate in all directions	Then protect persons downwind during		First isolate in all directions	Then protect persons downwind during	
	Day	Night		Day	Night
30 m	100 m	200 m	100 m	400 m	1,400 m

EMERGENCY RESPONSE

Fire

Move containers from the fire area if you can do it without risk.

Dike fire-control water for later disposal; do not scatter the material.

Use water spray or fog; do not use straight streams.

	Dry chemical	CO_2	Water spray	Fog	Regular foam	Alcohol-resistant foam	Dry sand
Toxic combustible and non-combustible	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓	LF - ✓		
Toxic and/or corrosive combustible and non-combustible	SF - ✓ LF - ✓	SF - ✓ LF - ✓	SF - ✓ LF - ✓			LF - ✓	
Water-sensitive	SF - ✓	SF - ✓	LF - ✓	LF - ✓		SF - ✓ LF - ✓	SF - ✓
Sodium cyanide	SF - ✓	✗	LF - ✓	LF - ✓		SF - ✓ LF - ✓	SF - ✓

SF – Small fire; LF – Large fire

Spill or Leak

Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Stop the leak if you can do it without risk.

Prevent entry into waterways, sewers, or confined areas.

Cover with a plastic sheet to prevent spreading or contact with rain.

Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers.

Do not get water inside containers.

Water-sensitive substances – All equipment used when handling the product must be grounded. A vapor-suppressing foam may be used to reduce vapors. Do not get water on spilled substances or inside containers. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

First Aid

Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.

Move a victim to fresh air.

Call 911 or emergency medical device.

Give artificial respiration if the victim is not breathing

Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Administer oxygen if breathing is difficult.

Remove and isolate contaminated clothing and shoes.

In case of contact with a substance, immediately flush the skin or eyes with running water for at least 20 minutes.
For minor skin contact, avoid spreading material on unaffected skin.
Keep the victim calm and warm.
Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

7.6 Emergency Response for Class 8

Class 8 - Corrosives
POTENTIAL HAZARDS
Fire or Explosion
Corrosive combustible, water-reactive substances, and corrosive gases – May burn but do not ignite readily. Some may ignite combustibles (wood, paper, oil, clothing, etc.).
Corrosive non-combustible substances and mercury- The substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some may ignite combustibles (wood, paper, oil, clothing, etc.).
Corrosive flammable/water-sensitive substances - Highly flammable; will be easily ignited by heat, sparks, or flames.
Corrosive spontaneously combustible (air-reactive) substances - Extremely flammable; will ignite themselves if exposed to air. Burn rapidly, releasing dense, white, irritating fumes. May re-ignite after fire is extinguished.
Corrosive flammable liquids and solids – Flammable/combustible material. May be ignited by heat, sparks, or flames.
Water-reactive (emitting flammable gases) substances - Produce flammable gases in contact with water. May ignite on contact with water or moist air. Some react vigorously or explosively in contact with water. May be ignited by heat, sparks, or flames. May re-ignite after fire is extinguished.
Oxidizers - These substances will accelerate burning when involved in a fire. Some may explosively decompose when heated or involved in a fire. May explode from heat or contamination. May ignite combustibles (wood, paper, oil, clothing, etc.). Some will explosively react with hydrocarbons (fuels).
Combustible, flammable/water-sensitive, combustible/water-sensitive substances, flammable liquids, and solids - Vapors may form explosive mixtures with air.
Water-sensitive and water-reactive substances - Substances will react with water (some violently), releasing flammable, toxic, or corrosive gases and runoff.
Corrosive gases - Some of these materials may react violently with water. Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket.
Flammable liquids and substances emitting flammable gases - Runoff may create fire or explosion hazards.
Combustible, non-combustible, water-sensitive, water-reactive, flammable solids, and air-reactive substances - Contact with metals may evolve flammable hydrogen gas.
Combustible, non-combustible, air-reactive substances, flammable liquids and solids, and oxidizers - Containers may explode when heated.
Water-sensitive and water-reactive substances - Containers may explode when heated or if contaminated with water.
Combustible, water-reactive, and air-reactive substances - May be transported in a molten form.
Water-reactive (emitting flammable gases) - Some are transported in highly flammable liquids.
Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas. Vapors may travel to the source of ignition and flashback.
Runoff from fire control or dilution water may cause pollution.

Health

Toxic: inhalation, ingestion, or contact (skin, eyes) with vapors, dust, or substance may cause severe injury, burns, or death.

Contact with substance may cause severe burns to the skin and eyes.

Avoid skin contact.

Water-sensitive substances - Reaction with water or moist air will release toxic, corrosive, or flammable gases. Reaction with water may generate a lot of heat that will increase the concentration of fumes in the air.

Corrosive gases - Vapors are extremely irritating and corrosive. Contact with gas or liquefied gas may cause burns, severe injury, and/or frostbite.

Flammable liquids - Vapors may cause dizziness or suffocation.

Combustible and non-combustible substances and oxidizers - Fire may produce irritating, corrosive, and/or toxic gases.

Water-sensitive, water-reactive, and air-reactive substances, corrosive gases, flammable liquids and solids, and mercury - Fire will produce irritating, corrosive, and/or toxic gases.

Effects of contact or inhalation may be delayed.

Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

PUBLIC SAFETY

As an immediate precautionary measure, isolate the spill or leak area in all directions for at least 50 meters for liquids and mercury, 25 meters for solids, and 100 meters for corrosive gases.

Keep unauthorized personnel away.

Stay upwind, uphill, and/or upstream.

Ventilate enclosed areas.

EVACUATION

Spill

Combustible, non-combustible, water-sensitive, water-reactive substances, and flammable corrosive liquids - Increase, in the downwind direction, as necessary, the isolation distance - at least 50 meters for liquids and at least 25 meters for solids.

Flammable corrosive solids, oxidizers, and corrosive gases – Consider initial downwind evacuation for at least 100 meters.

Air-reactive substances – Consider initial downwind evacuation for at least 300 meters.

Mercury – Large spill: Consider initial downwind evacuation for at least 100 meters; Fire: When any large container is involved in a fire, consider initial evacuation for 500 meters.

Sodium cyanide (when spilled in water)

Small spills			Large spills		
First isolate in all directions	Then protect persons downwind during		First isolate in all directions	Then protect persons downwind during	
	Day	Night		Day	Night
30 m	100 m	200 m	100 m	400 m	1,400 m
When spilled in water sodium cyanide will produce large amount of hydrogen cyanide (toxic gas).					

Nitric acid (red fuming)

Small spills			Large spills		
First isolate in all directions	Then protect persons downwind during		First isolate in all directions	Then protect persons downwind during	
	Day	Night		Day	Night
30 m	100 m	100 m	150 m	200 m	400 m

EMERGENCY RESPONSE

Fire

Move containers from the fire area if you can do it without risk.

Dike fire-control water for later disposal; do not scatter the material.

Water-sensitive substances – Some foams will react with the material and release corrosive/toxic gases. Large fire: Use water spray or fog; do not use straight streams.

Water-reactive substances – When a material is not involved in the fire, do not use water on the material itself. Large fire: Flood the fire area with large quantities of water while knocking down vapors with water fog. If insufficient water supply: knockdown vapors only.

Corrosive gases – Large fire: Do not get water inside containers. Damaged cylinders should be handled only by specialists.

Flammable corrosive liquids – Some of these materials may react violently with water. Do not get water inside containers.

Flammable corrosive solids – Large fire: Use water spray or fog; don't use straight streams. Don't get water inside containers.

Air-reactive substances – Large fire: Do not scatter spilled material with high-pressure water streams.

Water-reactive (emitting flammable gases) substances – Do not use water or foam. Fire involving metals or powders: Use dry chemical, dry sand, sodium chloride powder, graphite powder, or Met-L-X powder.

Oxidizers – Large fire: Flood the area with water from a distance. Do not move load or vehicle if a load has been exposed to heat.

Mercury – Use an extinguishing agent suitable for the type of surrounding fire. Do not direct water at the heated metal.

	Dry chemical	CO_2	Water spray	Fog	Regular foam	Alcohol-resistant foam	Dry sand	Wet sand or wet earth	Soda ash or lime
Combustible Non-combustible	SF - ✓ LF - ✓	SF - ✓ LF - ✓	SF - ✓ LF - ✓			LF - ✓			
Water-sensitive	SF - ✓	SF - ✓	LF - ✓	LF - ✓		SF - ✓ LF - ✓	SF - ✓		
Sodium cyanide	SF - ✓	✘	LF - ✓	LF - ✓		SF - ✓ LF - ✓	SF - ✓		
Water-reactive	SF - ✓	SF - ✓	LF - ✓						
Corrosive gases	SF - ✓	SF - ✓	LF - ✓	LF - ✓	LF - ✓				
Flammable liquids and solids	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓		SF - ✓ LF - ✓			
Air-reactive			SF - ✓ LF - ✓	LF - ✓				SF - ✓	
Water-reactive (emitting flammable gases)	SF - ✓ LF - ✓						SF - ✓ LF - ✓		SF - ✓ LF - ✓
Oxidizers	✘	SF - ✓	SF - ✓ LF - ✓		✘				

SF – Small fire; LF – Large fire

Spill or Leak

Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).

Do not touch or walk through the spilled material.

Do not touch damaged or spilled material unless wearing appropriate protective clothing.

Stop the leak if you can do it without risk.

Prevent entry into waterways, sewers, or confined areas.

Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers.

Do not get water inside containers.

Water-sensitive – All equipment used when handling the product must be grounded. A vapor-suppressing foam may be used to reduce vapors. Do not get water on spilled substance. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact the spilled material.

Water-reactive – Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. Use water spray to reduce vapors; do not put water directly on the leak, spill area, or inside the container. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Water-sensitive and water-reactive - Small spill: Cover with dry earth, dry sand, or other non-combustible material, followed by a plastic sheet to minimize spreading or contact with rain. Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

Corrosive gases - Fully encapsulating, vapor-protective clothing should be worn for spills & leaks with no fire. If possible, turn the leaking containers so that gas escapes rather than liquid. Do not direct water to spill or source of the leak. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Isolate the area until gas has dispersed.

Flammable liquids - Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. All equipment used when handling the product must be grounded. A vapor-suppressing foam may be used to reduce vapors. Absorb with earth, sand, or other non-combustible material and transfer to containers. Use clean, non-sparking tools to collect absorbed material. Large spill: Dike far ahead of liquid spill for later disposal. Water spray may reduce vapor but may not prevent ignition in closed spaces.

Flammable solids – Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

Air-reactive - Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. Small spill: Cover with water, sand, or earth. Shovel into a metal container and keep material underwater. Large spill: Dike for later disposal and cover with wet sand or earth.

Water-reactive (emitting flammable gases) – Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact the spilled material. Do not get water on the spilled substance or inside containers. Small spill: Cover with dry earth, dry sand, or other non-combustible material, followed by a plastic sheet to minimize spreading or contact with rain. Dike for later disposal; do not apply water unless directed to do so. Powder spill: Cover powder spill with a plastic sheet or tarp to minimize spreading and keep the powder dry. Do not clean up or dispose of, except under the supervision of a specialist.

Oxidizers – Keep combustibles (wood, paper, oil, etc.) away from the spilled material. Small dry spill: With a clean shovel, place material into a clean, dry container and cover loosely; move containers from the spill area. Small liquid spill: Use a non-combustible material like vermiculite or sand to soak up the product and place it into a container for later disposal. Large spill: Dike far ahead of liquid for later disposal. Following product recovery, flush the area with water.

Mercury – Do not use steel or aluminum tools or equipment. Cover with earth, sand, or other non-combustible material, followed by a plastic sheet to minimize spreading or contact with rain. Use a mercury spill kit. Mercury spill areas may be subsequently treated with calcium sulfide or with sodium thiosulfate wash to neutralize any residual mercury.

First Aid

Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.

Move a victim to fresh air.

Call 911 or emergency medical device.
Give artificial respiration if the victim is not breathing
Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Administer oxygen if breathing is difficult.
Remove and isolate contaminated clothing and shoes.
In case of contact with a substance, immediately flush the skin or eyes with running water for at least 20 minutes.
For minor skin contact, avoid spreading the material on unaffected skin.
Keep the victim calm, warm, and under observation.
Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.
Corrosive gases – In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
Air-reactive substances – Removal of solidified molten material from the skin requires medical assistance.
Oxidizers – Contaminated clothing may be a fire risk when dry.

7.7 Emergency Response for Mixed Load/Unidentified Cargo

Mixed Load/Unidentified Cargo
POTENTIAL HAZARDS
Fire or Explosion
May explode from heat, shock, friction, or contamination. May react violently or explosively in contact with air, water, or foam. May be ignited by heat, sparks, or flames. Vapors may travel to the source of ignition and flashback. Containers may explode when heated. Ruptured cylinders may rocket.
Health
Inhalation, ingestion, or contact with substances may cause severe injury, infection, disease, or death. A high concentration of gas may cause asphyxiation without warning. Contact may cause burns to the skin and eyes. Fire or contact with water may produce irritating, toxic, and/or corrosive gases. Runoff from fire control may cause pollution.
PUBLIC SAFETY
As an immediate precautionary measure, isolate the spill or leak area for at least 100 in all directions. Keep unauthorized personnel away. Stay upwind, uphill, and/or upstream. EVACUATION <u>Fire</u> If a tank or tank truck is involved, isolate for 800 m in all directions; also, consider initial evacuation for 800 m in all directions.
EMERGENCY RESPONSE
Fire
Material may react with an extinguishing agent. Move containers from the fire area if you can do it without risk.

Fire involving tanks

Cool containers with flooding quantities of water until well after the fire is out.

Do not get water inside containers.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

Always stay away from a tank engulfed in fire.

Mixed load/unidentified cargo	Dry chemical	CO_2	Water spray	Fog	Regular foam
	SF - ✓	SF - ✓	SF - ✓ LF - ✓	LF - ✓	SF - ✓ LF - ✓

SF – Small fire; LF – Large fire

Spill or Leak

Eliminate all ignition sources (no smoking, flares, sparks, or flames in the immediate area).

Do not touch or walk through spilled material.

All equipment used when handling the product must be grounded.

Keep combustibles (wood, paper, oil, etc.) away from the spilled material.

Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.

Prevent entry into waterways, sewers, or confined areas.

Do not touch damaged or spilled material unless wearing appropriate protective clothing.

Stop leak if you can do it without risk.

Small spill

Pick up with sand or other non-combustible absorbent material and place into containers for later disposal.

Large spill

Dike far ahead of liquid spill for later disposal.

First Aid

Ensure that medical personnel is aware of the material(s) involved and take precautions to protect themselves.

Move a victim to fresh air.

Call 911 or emergency medical device.

Give artificial respiration if the victim is not breathing

Do not use the mouth-to-mouth method if the victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Administer oxygen if breathing is difficult.

Remove and isolate contaminated clothing and shoes.

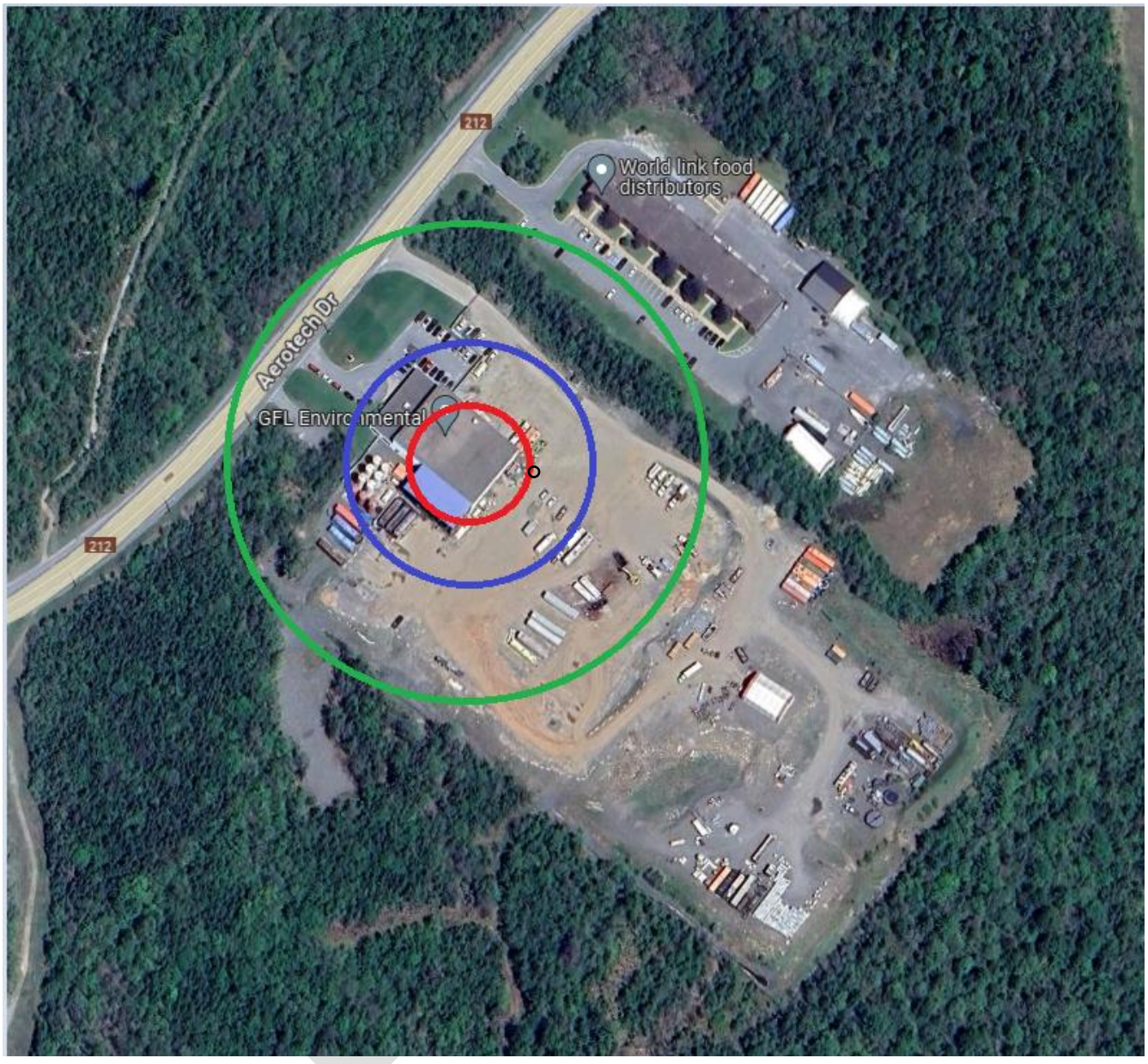
In case of contact with the substance, immediately flush the skin or eyes with running water for at least 20 minutes.

Shower and wash with soap and water.

Keep the victim calm, warm, and under observation.

Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

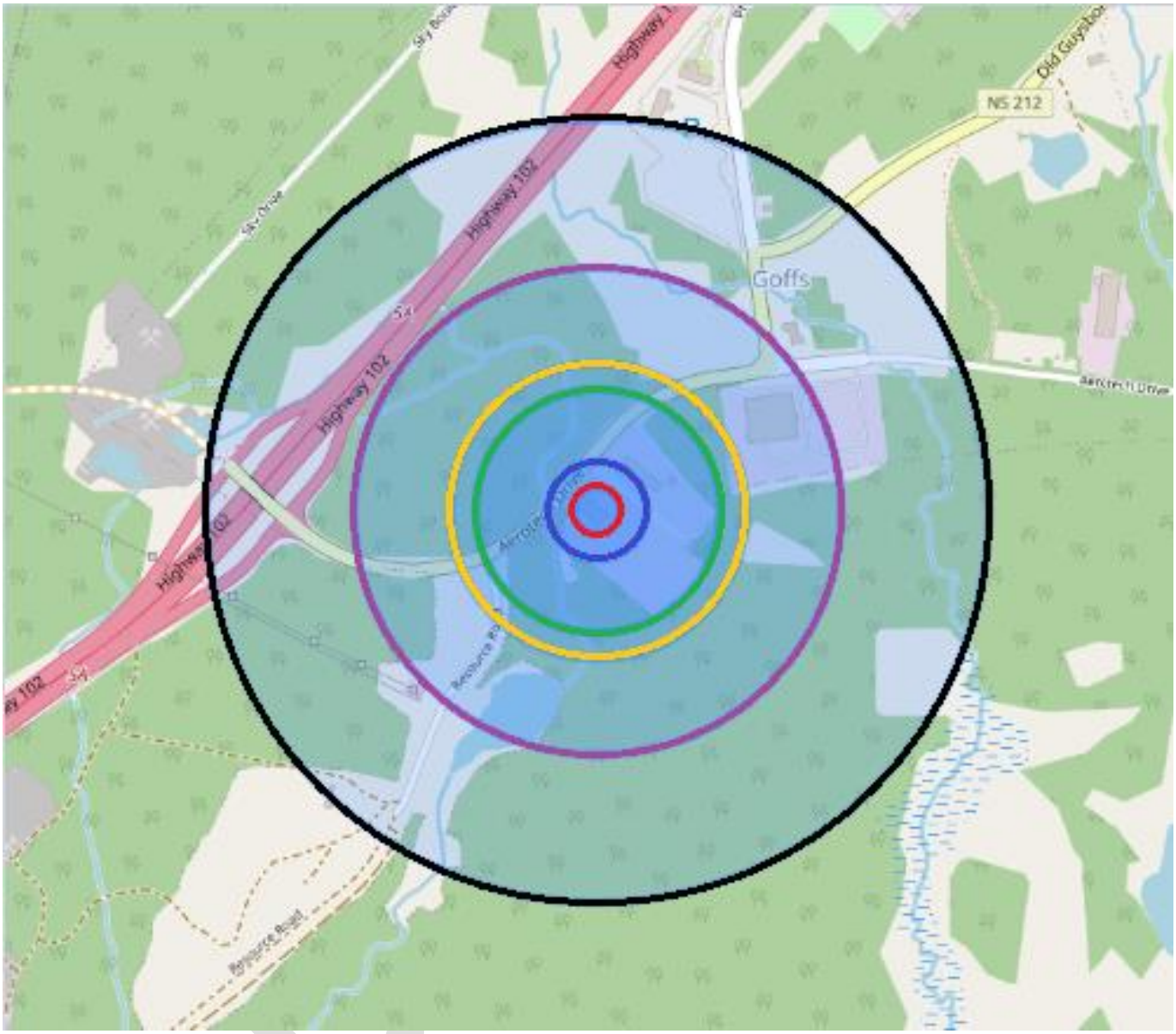
7.8 Spill or Leak – Isolation Distances



Legend:

Solids – 25 meters
Liquids and mercury – 50 meters
Gases – 100 meters

7.9 Large Spill – Evacuation Distances



Legend:

Metals, toxic substances, corrosives – 50 meters
Inert gases, flammable solids, oxidizers, mercury, corrosive gases – 100 meters
Self-reactive substances, organic peroxides – 250 meters
Flammable liquids, spontaneously combustible (air-reactive) substances – 300 meters
Oxidizing and compressed or liquefied gases – 500 meters
Flammable gases, flammable-corrosive gases – 800 meters

8. EVACUATION PLAN

All employees, customers, visitors, and contractors will immediately leave the work area and report to the facility evacuation meeting point. The office is the first meeting point, but if there is a hazard around the office, then go to the second meeting point, which is the main gate. The facility evacuation meeting points are posted. Refer to Google Map Image of Facility (Appendix 1). In the event of alarm or announcement of evacuation.

The Site Emergency Coordinator shall:

- Take all work permits and visitor sign-in book
- Report to the office main gate
- Account for all personnel
- Organize a response team, if required
- Contact authorities, if required; (Section 2.4)
- Proceed with Crisis Communication Schedule, if required; (Section 6.3).

The employees shall:

- Advise all visitors, customers, and contractors of alarm, if possible
- Shut down facility of operating equipment and processes, if possible
- Report to the office or main gate.

No person shall be allowed to return to his or her respective work areas until an “all clear” has been given by the Site Emergency Coordinator.

9. REHABILITATION

The restoration of the site following an incident and decontamination of personnel and equipment is an integral part of the Contingency and Emergency Response Plan.

The intent is to restore the affected area to the same condition as before the spill. Site restoration will follow the following steps and pertains to spills inside and outside the facility, both on and off the containment areas:

- Contain and clean up the spill in accordance with spill clean-up procedures.
- Containerize all clean-up and waste material.
- Sample ground of affected surfaces to determine the effectiveness of clean-up and disposal requirements.
- Continue to remove soil and infrastructure until analyses prove non detect contaminants.
- Perform civil and landscape as required to get the area back to pre-spill condition.
- Site rehabilitation may be required to be approved as complete by NS Environment and Climate Change or Site Professional.

10. DISPOSAL

The method of handling and disposal of waste materials during the response is dependent on several conditions. For example:

- Volume of material
- Physical properties – liquid, solids, mixtures of both
- Chemical properties – acid, base, solvent, etc.

Depending on the volume, liquids will be either containerized in drums or collected in a vacuum truck. Storage at the site will follow the present waste handling procedures. The drums will temporarily be stored within the facility before shipment to internal and external disposal/treatment outlets utilized by GFL Environmental Services Inc. Large volume liquids will be transferred via tanker truck to disposal/treatment outlets.

Similarly, solids handling depends on the amounts of material. Drummed material will be stored within the facility. Larger volumes will be contained within appropriate sludge bins and kept in the solids consolidation area for shipment to the appropriate facility.

Transport will be performed using GFL transport in approved and licensed vehicles or contracted out to approved service providers.

Disposal/treatment will be through approved methods and outlets and will be typical of those utilized for wastes normally received on site. All wastes shipped off-site will be approved by the District Manager and appropriate waste shipping documents completed.

11. TRAINING AND PRACTICE DRILLS

11.1 Employee Training Requirements

All employees will receive orientation within one week of hiring, and any employee who changes duties will be upgraded immediately. All records of training will be held in the employee's file.

All personnel may be trained in the following:

- Fire Safety and Extinguisher Use
- Transportation of Dangerous Goods Act and Regulations (TDG)
- Workplace Hazardous Materials Information System (WHMIS 2015)
- First Aid – Emergency First Aid
- Chemical Hazards
- H_2S Alive
- Respirator Fit Test (Full Face)
- Pulmonary Test
- Confined Space
- Confined Space Rescue
- SCBA/SABA
- Incident/ Accident Investigation
- Hazard Identification
- HAZWOPER Training (40-hr course)
- Safety Data Sheet (SDS) Review
- Contingency and Emergency Response Plan
- Personal Protective Equipment (PPE)
- Standard Operating Procedures (SOP)
    - High Pressure Water Blasting
    - Compressed Gas Cylinders
    - Hydrogen Sulfide (H_2S)
    - Lock Out & Tag Out (LOTO)
    - Respiratory Protective Equipment
    - Vacuum Truck Operation
    - Lift Truck Operation
    - Confined Space Management
    - Cleaning of Corrosive Substances
    - Vacuum (specific) - dry, corrosive, non-corrosive, flammable, etc.
    - Mobile Wash Operation

11.2 Contractor Training Requirements

All contractors are required to be given a site-specific orientation on an annual basis. During the orientation contractors will be alerted of potential hazards, given emergency procedures, and made aware of GFL safety standards and regulations.

Rules and Regulations:

- Contractors will comply with all GFL safety policies as well as all site-specific rules and will review and sign the company safety handbook.

- Contractors are required to provide and wear clothing and personal protective equipment required by GFL policy.
- No smoking outside designated smoking areas.
- No running inside the facility.
- Maximum vehicle speed on site is 10 km/hr (unless posted otherwise).
- Before being allowed to commence work within a facility, a contractor must obtain the required safe work permits for Hot/Cold Work.
- Before being allowed to commence work within a facility, a contractor must undergo a safety orientation.
- A contractor must be given permission by a plant employee before proceeding with a vehicle into the facility or work site.
- All contractors must sign in and out of the visitor log sheets.

11.3 Practice Drills

A desktop and a simulated exercise shall be conducted a minimum of twice a year. From these exercises, the following evaluation shall be determined:

- Practicality of the plan (structure and organization)
- Adequacy of communication and interaction amount parties
- Emergency equipment effectiveness
- Donning and doffing SABA and SCBA equipment
- Adequacy of first aid and rescue procedures
- Adequacy of emergency personnel response training
- Public Relations skills
- Evacuation and personnel count procedures.

12. PLAN EVALUATION AND UPDATES

This Plan shall be reviewed and immediately amended whenever:

- An annual review is due
- The Plan fails in an emergency
- The facility changes in its design, construction, operation, maintenance, equipment, or products or other circumstances in a way that increases the potential for fire, explosions, or release of a hazardous substance
- The list of emergency contacts changes, or
- The list of emergency equipment changes.

13. INVENTORY OF EMERGENCY RESPONSE EQUIPMENT

13.1 Fire Response Equipment

Inventory	Description				Location	Serial #
Unit #	Size	Type	Class	Mfd/H*	**Office**	#
1	10	ABC	DC	2024	Laboratory	83032610
2	10	ABC	DC	2024	Front Entry	96792987
3	5	ABC	DC	2024	Hallway Near Women's Bathroom	93550076
4	10	ABC	DC	2024	Lunchroom	9526653
Unit #	Size	Type	Class	Mfd/H*	**Shop**	#
5	10	ABC	DC	2024	Shop Entrance North	83032609
6	20	ABC	DC	2024	Shop Entrance South	7064122
7	20	ABC	DC	2024	Main Walkway Near Treatment Filters	7064358
8	2.5	ABC	DC	2024	Post Ozone Machine	31828888
9	5	ABC	DC	2024	Front of Filter Crusher	41637317
10	20	ABC	DC	2024	Front of Weir Tank	13555514
11	10	ABC	DC	2024	Shop Exit to Yard	83032605
12	10	BC	CO2	2024	Welding Area	324413
13	10	ABC	DC	2024	Walkway between Precipitation Tanks and Filters	444039
14	10	ABC	DC	2024	Water Treatment Chemical Storage	1537989
Unit #	Size	Type	Class	Mfd/H*	**Offloading Area/Yard**	#
15	20	ABC	DC	2024	Guard Tank Sea-can	7064123
16	20	ABC	DC	2024	Top of Guard Tank	7064127
17	20	ABC	DC	2024	Sea-can in Bermed Guard Tank Area	87816947
18	20	ABC	DC	2024	Next to Diesel Pump	7064113
19	20	ABC	DC	2024	Tent in Back of Yard	13555523
20	20	ABC	DC	2024	Scale House	31818238
Unit #	Size	Type	Class	Mfd/H*	**Yard Equipment**	#
21	5	ABC	DC	2024	Forklift 25	31910477
22	5	ABC	DC	2024	CAT Loader	76442817
23	5	ABC	DC	2023	Komatsu Excavator	41637308
24	5	ABC	DC	2023	Forklift 30	31910718
*Mfd/H = Manufacture or last hydro date						
All working vehicles carry a fire extinguisher in addition to those listed above						

13.2 Containment Equipment

Item	Inventory	Location
Regular Spill Kit	6	2 in Water Treatment Chemical Storage Area, 1 by Clarifier in Water Treatment, 1 by Guardtank offloading area, 1 by Oil Tanks, 1 in lab
Caustic Spill Kit	1	Water Treatment Chemical Storage
Acid Spill Kit	1	Water Treatment Chemical Storage
Spill Trays	8	Shop Floor
Sorbents (Absorbent Socks)	4 Boxes	Shop Floor and Lab
Squeegees	3	Shop Floor and Offloading Area
Shovels	7	Shop Floor, Offloading Area and Tent
Absorbent	3	Shop Floor and Offloading Area
Spill Pads	1 Pallet	Shop Floor, Tent
All working vehicles carry a Spill Kit in addition to the ones listed above		

13.3 Communication System

Item	Inventory	Location
Fixed Office Phones	17	Each Desk and Lunchroom
Airhorns	2	Shop Floor
All Staff carry Work Designated or Personal Cell Phone for Contact		

13.4 Decontamination Equipment

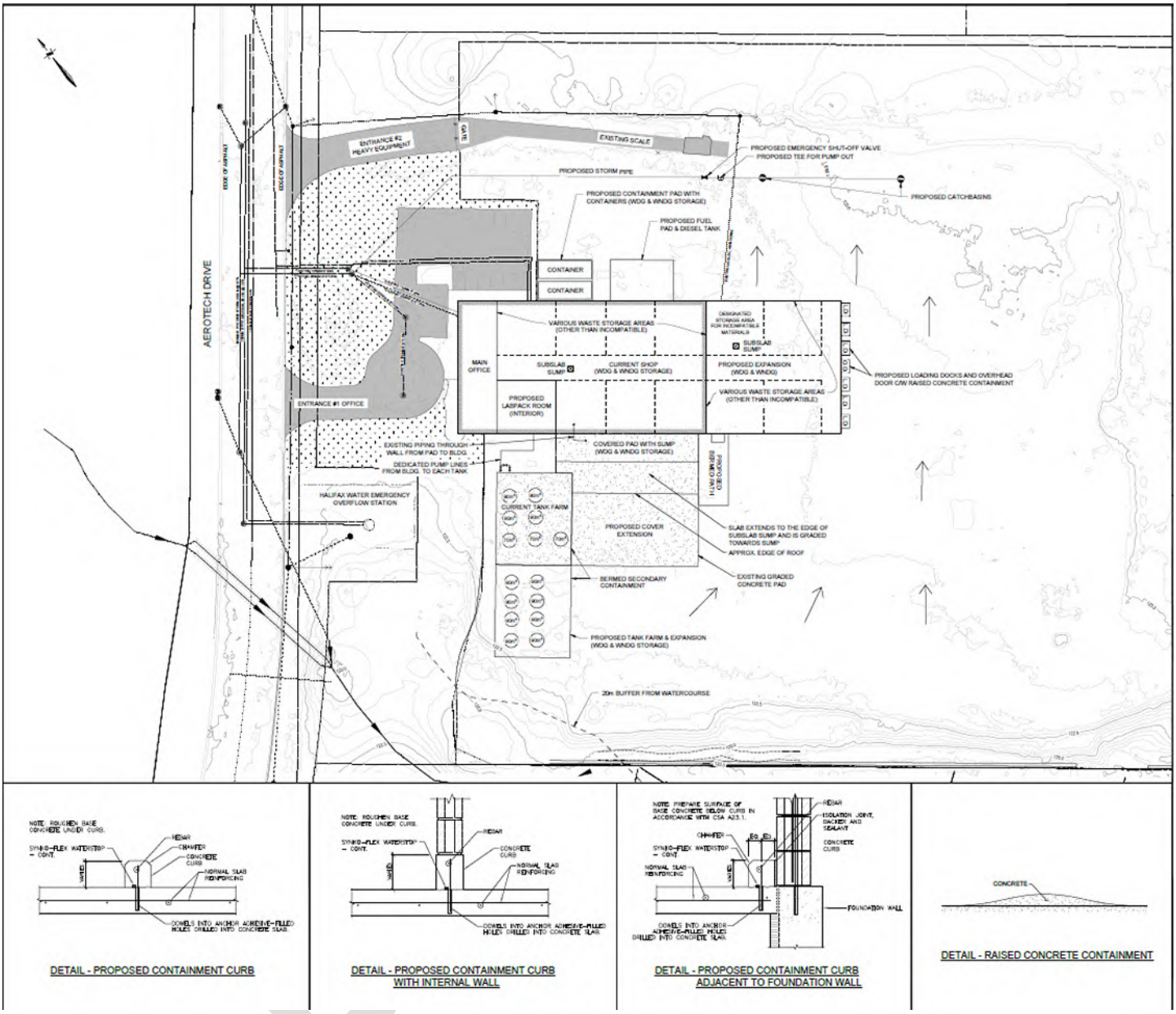
Item	Inventory	Location
Emergency Shower/Eye Wash	2	Shop Floor and Lab
Emegency Eye Wash Bottles	4	Shop Floor, Lab, Maintenance Area

13.5 First Aid Equipment

Item	Inventory	Location
AED	1	Shop Entrance Near Lunchroom
Emergency Blanket	1	Shop Entrance Near Lunchroom
Standard First Aid Kit (Regular)	7	Lab, Maintenance Area, Lunchroom, Offloading Sea-can, Tent, Loader
Standard First Aid Kit (Large)	1	Shop Entrance Near Lunchroom
SCBA	3	Lunchroom Hallway
Additional Air Cannisters for SCBA	4	Lunchroom Hallway
All working vehicles also contain a first aid kit in addition to those listed above. All field and shop staff also have the own half mask respirators.		

Appendix 1 – Google Map Image of Facility

Appendix 2 – Facility Site Plan



***Note**: DG Containers and fueling pad exact location may vary but remain in the same general vicinity*

Appendix 3 – Map Showing Businesses and Residences Within 2 km Radius of Facility

Appendix 4 – Spill Quantities/Levels for Immediate Reporting to NS Environment and Climate Change

TDG Class	Description of Substance	Reportable Release Amount
1	Explosive	any amount
2.1	Compressed gas (flammable)	> 100 L
2.2	Compressed gas (non-corrosive, non-flammable)	> 100 L
2.3	Compressed gas (toxic)	any amount
3	Flammable liquid	> 100 L
4.1	Flammable solid	> 25 kg
4.2	Spontaneously combustible solid	> 25 kg
4.3	Water reactant solid	> 25 kg
5.1	Oxidizing substance	> 50 L or > 50 kg
5.2	Organic peroxide	> 1 L or > 1 kg
6.1	Poisonous substance	> 5 L or > 5 kg
6.2	Infectious substance	any amount
7	Radioactive substance	any amount
8	Corrosive substance	> 5 L or > 5 kg
9 (in part)	Miscellaneous product or substance, excluding PCB mixtures and environmentally hazardous substances	> 25 L or > 25 kg
9 (in part)	PCB mixture of 50 or more ppm	> 0.5 L or > 0.5 kg
9 (in part)	Environmentally hazardous substance	> 1 L or > 1 kg
N/A	Asbestos waste	> 50 kg
N/A	Used oil	> 100 L
N/A	Contaminated used oil	> 5 L
N/A	Pesticide in concentrated form	> 5 L or > 5 kg
N/A	Pesticide in diluted form	> 70 L
N/A	Unauthorized sewage discharge into fresh water or sensitive marine water	> 100 L
N/A	Ozone-depleting substance	> 25 kg

Appendix 5 – Tank Volumes and Contents

Tank Number	Volume, litres	Content
VT01	63,595	Wastewater
VT02	63,595	Wastewater
WO-01	60,000	Used Oil
V1	90,000	Used Oil
V2	90,000	Used Oil
V3	90,000	Used Oil
V4	90,000	Used Oil
V5	90,000	Used Oil
V6	90,000	Used Oil
V7	70,000	Used Oil
V8	70,000	Used Oil
FP-01	10,000	Fuel
V9	70,000	Used Oil
HL-01	90,000	Used Oil
HL-02	90,000	Used Oil
BFT-01	79,494	Water Treatment Concentrate
GT-01	79,494	Oily Water
TBD - New	90,000	Site Water / Oily Water
TBD - New	90,000	Site Water / Oily Water
TBD - New	90,000	Fuel Blend - Class 3 Flammable
TBD - New	90,000	Fuel Blend - Class 3 Flammable
TBD - New	90,000	Fuel Blend - Class 3 Flammable
TBD - New	90,000	Fuel Blend - Class 3 Flammable
TBD - New	90,000	Wastewater / Glycol
TBD - New	90,000	Wastewater / Glycol

Appendix G
Consultation

ENGLOBE

From: Lauren Bowser
Sent: August 7, 2024 2:52 PM
To: chief@millbrookband.com
Cc: DesRoche, Gillian; info@mikmaqrights.com; Aven Cole; Matt Zwicker
Subject: Engagement letter
Attachments: Mi'kmaq_consultation letter_Millbrook.pdf

Good afternoon,

Please see attached.

Thanks,

Lauren Bowser, B.Sc. Env.
Project Manager
Environmental Engineering
T 902.468.6486 ext. 167126 | M 902.293.4516

ENGLOBE
97 Troop Ave., Dartmouth, Nova Scotia B3B 2A7
englobecorp.com

Chief Robert Gloade
P.O. Box 634, 820 Willow Street,
Truro, NS B2N 5E5

August 7, 2024

Dear Chief Robert,

I am writing to you about the treatment facility that is located at 203 Aerotech Drive site in Goffs, Nova Scotia. This treatment facility is on land owned by CleanEarth Industrial Services Inc., and is operated by GFL Environmental Services Inc. (GFL). The facility has operated under an Industrial Approval issued by Nova Scotia Environment and Climate Change (NSECC) since 2005. The facility currently treats wastewater and is a transfer location for handling and ultimate disposal of small quantities of waste non-dangerous and dangerous goods. Wastewater is received from outside sources and treated onsite, with all treated wastewater effluent being discharged to the Halifax Water Sanitary sewer. Waste goods (such as oily rags, oil filters, paint drums, etc.) are received in containers and are processed to capture reusable or recyclable products (such as waste oil) before consolidation into containers for off-site disposal. All liquid and solid waste resulting from the wastewater treatment process and waste good handling are hauled to a number of different facilities for final disposal.

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- The project will not require any ground disturbance outside the industrial facility footprint. Therefore, no archaeological assessments are required.

The Environmental Assessment will be made publicly available and there will be a period for the public to make comment. In advance of that period, we would like to hear from you about any concerns that you may have. We also would be happy to provide a digital copy of the Environmental Assessment in advance of the project registration. Please contact the undersigned to provide us with concerns and electronic contact details for the Environmental Assessment report.

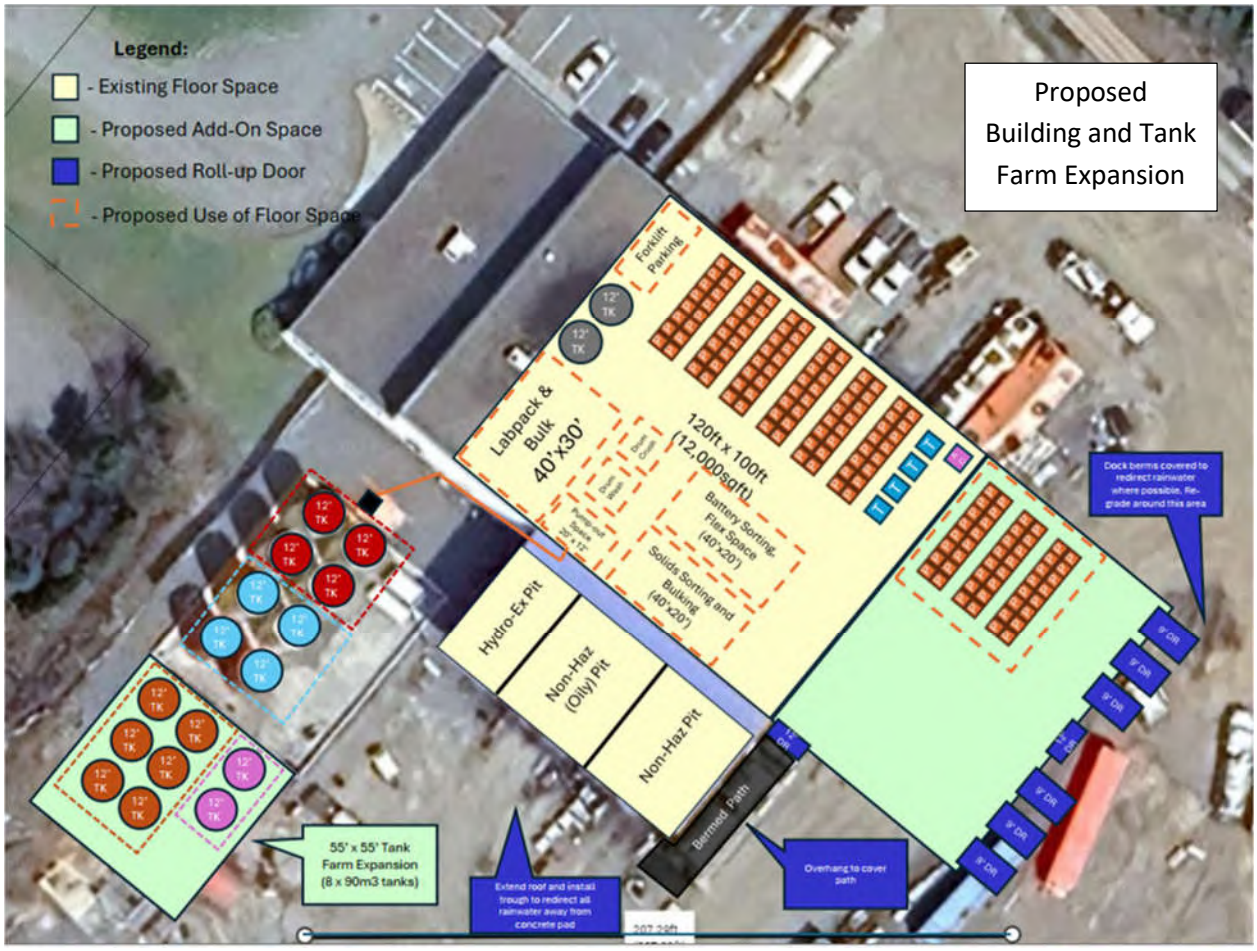
Yours truly,

Aven Cole
By mail: 97 Troop Avenue, Dartmouth, NS B3B 2A7
By email: aven.cole@englobecorp.com
By phone: 902-468-6486

Lauren Bowser
By mail: 97 Troop Avenue, Dartmouth, NS B3B 2A7
By email: lauren.bowser@englobecorp.com
By phone: 902-468-6486

cc. Nova Scotia Office of L'nu Affairs
Gillian DesRoche
Senior Consultation Advisor
PO Box 115 STN Central, Halifax, NS B3J 2L4
902-717-7253

Kwilmu'kw Maw-klusuaqn Negotiation Office
Lands Department
75 Treaty Trail, Millbrook, NS B6L 1W3
Main Office: 902-843-3880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Overhang to cover path

From: Lauren Bowser
Sent: August 7, 2024 2:55 PM
To: michelleglasgow@sipeknekatik.ca
Cc: DesRoche, Gillian; info@mikmaqrights.com; Aven Cole; Matt Zwicker
Subject: Engagement letter
Attachments: Mi'kmaq_consultation letter_Indian Brook.pdf

Good afternoon,

Please see attached.

Thanks,

Lauren Bowser, B.Sc. Env.
Project Manager
Environmental Engineering
T 902.468.6486 ext. 167126 | M 902.293.4516

ENGLOBE
97 Troop Ave., Dartmouth, Nova Scotia B3B 2A7
englobecorp.com

Chief Michelle Glasgow
522 Church Street,
Indian Brook, NS B0N 1W0

August 7, 2024

Dear Chief Michelle,

I am writing to you about the treatment facility that is located at 203 Aerotech Drive site in Goffs, Nova Scotia. This treatment facility is on land owned by CleanEarth Industrial Services Inc., and is operated by GFL Environmental Services Inc. (GFL). The facility has operated under an Industrial Approval issued by Nova Scotia Environment and Climate Change (NSECC) since 2005. The facility currently treats wastewater and is a transfer location for handling and ultimate disposal of small quantities of waste non-dangerous and dangerous goods. Wastewater is received from outside sources and treated onsite, with all treated wastewater effluent being discharged to the Halifax Water Sanitary sewer. Waste goods (such as oily rags, oil filters, paint drums, etc.) are received in containers and are processed to capture reusable or recyclable products (such as waste oil) before consolidation into containers for off-site disposal. All liquid and solid waste resulting from the wastewater treatment process and waste good handling are hauled to a number of different facilities for final disposal.

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Yours truly,

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By mail: 97 Troop Avenue, Dartmouth, NS B3B 2A7
By email: aven.cole@englobecorp.com
By phone: 902-468-6486

Lauren Bowser
By mail: 97 Troop Avenue, Dartmouth, NS B3B 2A7
By email: lauren.bowser@englobecorp.com
By phone: 902-468-6486

cc. Nova Scotia Office of L'nu Affairs
Gillian DesRoche
Senior Consultation Advisor
PO Box 115 STN Central, Halifax, NS B3J 2L4
902-717-7253

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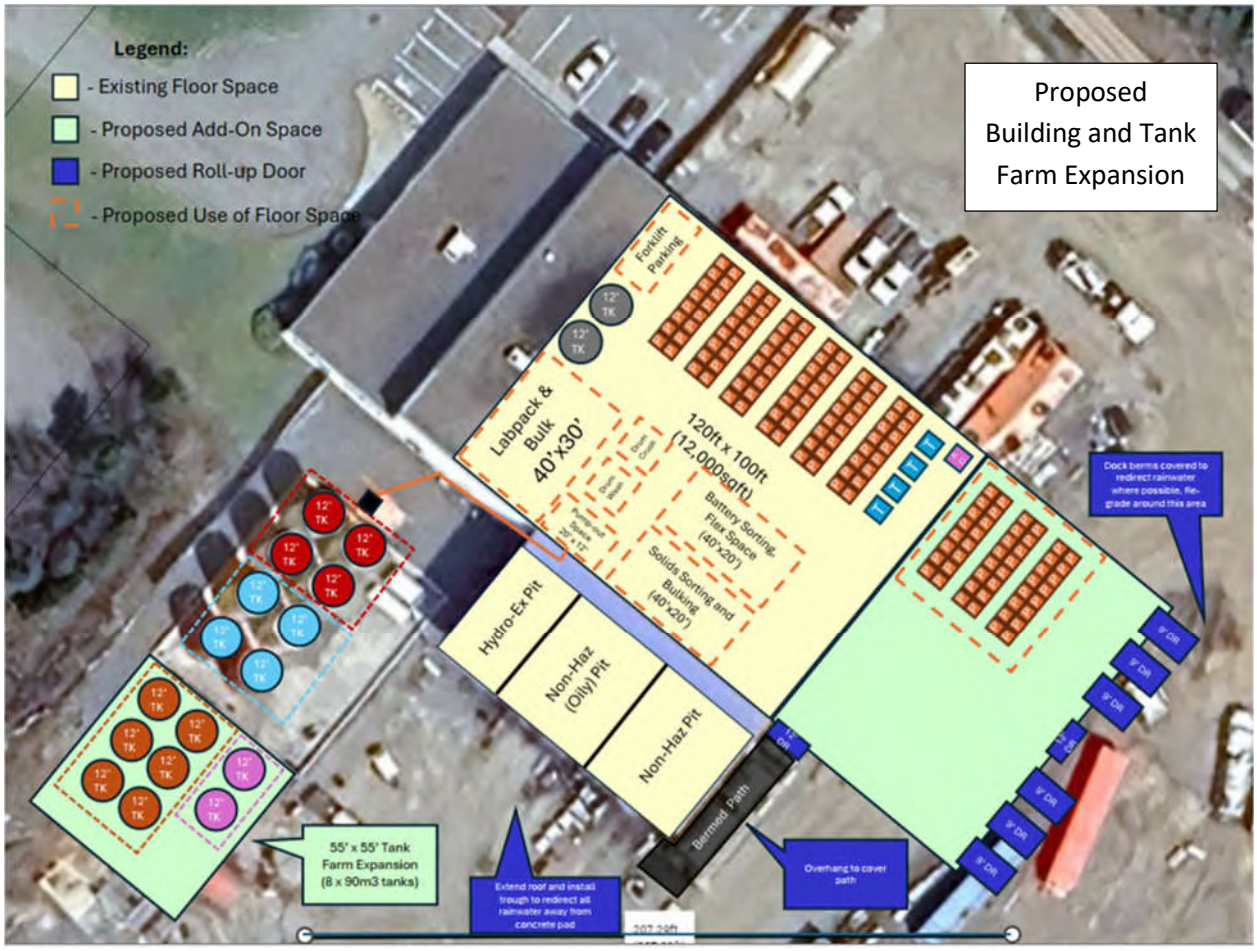
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Overhang to cover path

From: Lauren Bowser
Sent: September 17, 2024 10:52 AM
To: comms@cmmns.com
Cc: DesRoche, Gillian; info@mikmaqrights.com; Aven Cole; Matt Zwicker
Subject: Engagement letter
Attachments: Mi'kmaq_consultation letter_CMM.pdf

Good afternoon,

Please see attached.

Thanks,

Lauren Bowser, B.Sc. Env.
Project Manager
Environmental Engineering
T 902.468.6486 ext. 167126 | M 902.293.4516

ENGLOBE
97 Troop Ave., Dartmouth, Nova Scotia B3B 2A7
englobecorp.com

The Confederacy of Mainland Mi'kmaq
52 Legends Avenue,
Millbrook, NS B6L 0A3

September 17, 2024

Dear CMM,

I am writing to you about the treatment facility that is located at 203 Aerotech Drive site in Goffs, Nova Scotia. This treatment facility is on land owned by CleanEarth Industrial Services Inc., and is operated by GFL Environmental Services Inc. (GFL). The facility has operated under an Industrial Approval issued by Nova Scotia Environment and Climate Change (NSECC) since 2005. The facility currently treats wastewater and is a transfer location for handling and ultimate disposal of small quantities of waste non-dangerous and dangerous goods. Wastewater is received from outside sources and treated onsite, with all treated wastewater effluent being discharged to the Halifax Water Sanitary sewer. Waste goods (such as oily rags, oil filters, paint drums, etc.) are received in containers and are processed to capture reusable or recyclable products (such as waste oil) before consolidation into containers for off-site disposal. All liquid and solid waste resulting from the wastewater treatment process and waste good handling are hauled to a number of different facilities for final disposal.

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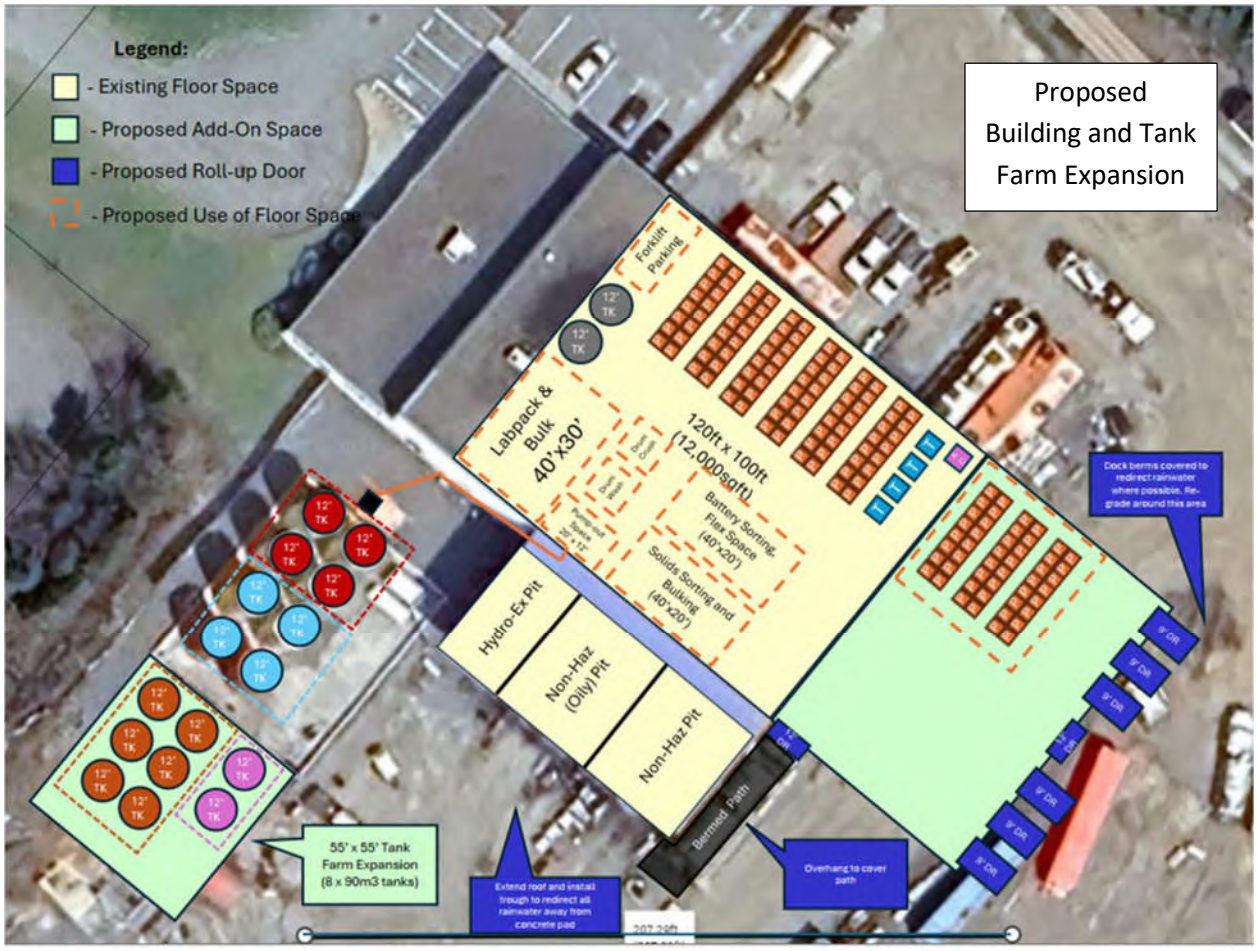
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From: Lauren Bowser
Sent: August 7, 2024 3:59 PM
To: mapc@mapcorg.ca
Cc: DesRoche, Gillian; info@mikmaqrights.com; Aven Cole; Matt Zwicker
Subject: Engagement letter
Attachments: Mi'kmaq_consultation letter_MAPC.pdf

Good afternoon,

Please see attached.

Thanks,

Lauren Bowser, B.Sc. Env.
Project Manager
Environmental Engineering
T 902.468.6486 ext. 167126 | M 902.293.4516

ENGLOBE
97 Troop Ave., Dartmouth, Nova Scotia B3B 2A7
englobecorp.com

Maritime Aboriginal Peoples Council
80 Walker Street, Suite 3,
Truro, NS B2N 4A7

August 7, 2024

Dear MAPC,

I am writing to you about the treatment facility that is located at 203 Aerotech Drive site in Goffs, Nova Scotia. This treatment facility is on land owned by CleanEarth Industrial Services Inc., and is operated by GFL Environmental Services Inc. (GFL). The facility has operated under an Industrial Approval issued by Nova Scotia Environment and Climate Change (NSECC) since 2005. The facility currently treats wastewater and is a transfer location for handling and ultimate disposal of small quantities of waste non-dangerous and dangerous goods. Wastewater is received from outside sources and treated onsite, with all treated wastewater effluent being discharged to the Halifax Water Sanitary sewer. Waste goods (such as oily rags, oil filters, paint drums, etc.) are received in containers and are processed to capture reusable or recyclable products (such as waste oil) before consolidation into containers for off-site disposal. All liquid and solid waste resulting from the wastewater treatment process and waste good handling are hauled to a number of different facilities for final disposal.

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By phone: 902-468-6486

Lauren Bowser
By mail: 97 Troop Avenue, Dartmouth, NS B3B 2A7
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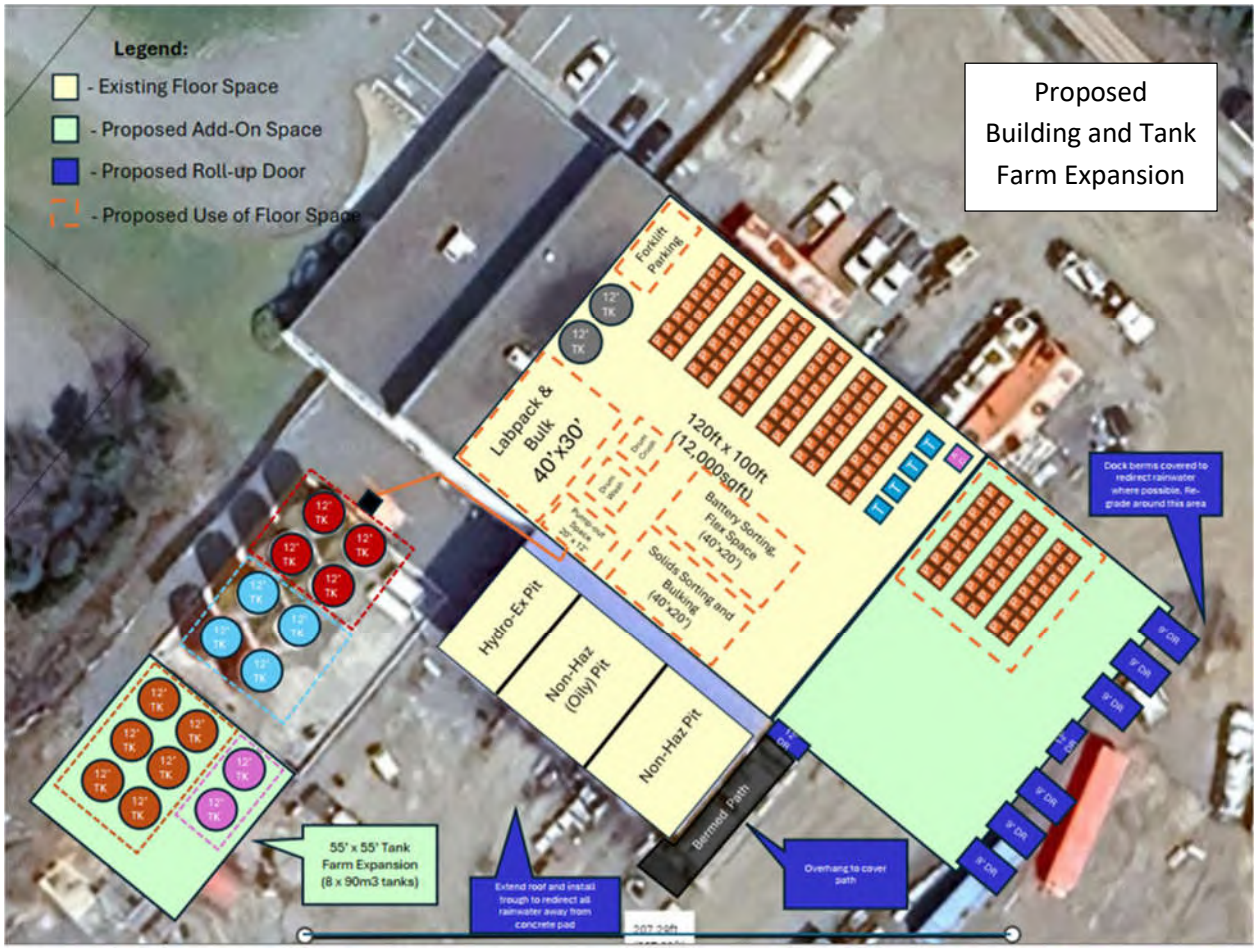
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