ENVIRONMENTAL PROTECTION PLAN

ENVIRONMENTAL WASTE PROCESSING FACILITY

Qikqtaaluk Environmental Inc.
PO Box 2110
2027 Iqaluit Lane
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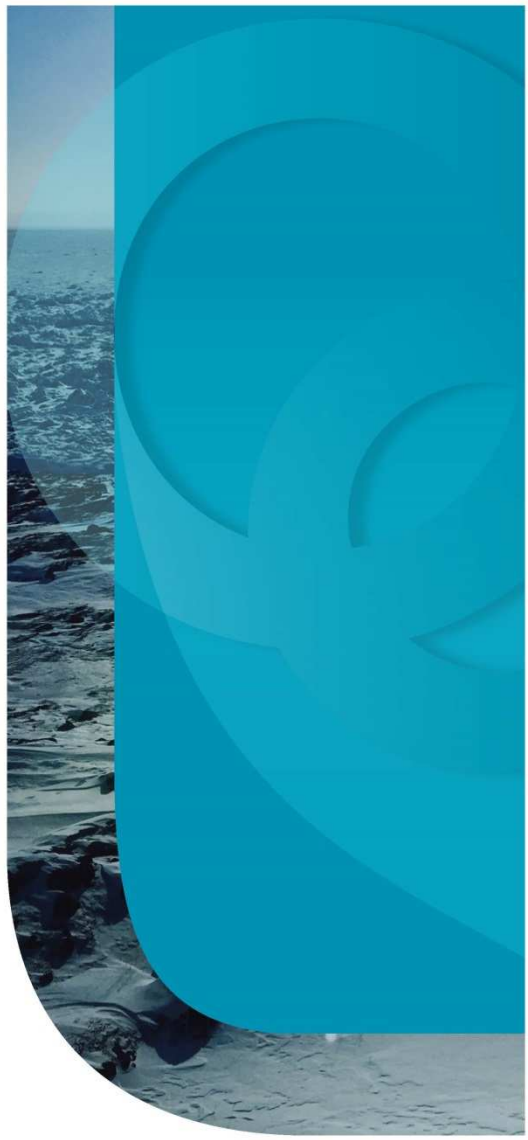

September 25, 2020
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Environmental Protection Plan

Environmental Waste Processing Facility

Qikqtaaluk Environmental Inc.
PO Box 2110
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September 25, 2020

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INTRODUCTION

Qikiqtaaluk Environmental Inc. (QE) was established in Iqaluit, Nunavut in 2003. Its activities include mould and asbestos assessments and abatement, site remediation management of hazardous and non-hazardous waste, contaminated water and soil management and treatment at its Environmental Waste Processing Facility (EWPF). This Environmental Protection Plan (EPP) describes these activities and the measures QE has put in place to prevent contaminants from migrating outside the EWPF. Monitoring wells, watertight lined cells and proper storage are some of the measures used by QE to prevent contaminants from migrating away from the EWPF.

Hazardous waste is collected from various clients in Iqaluit and the surrounding communities. This waste consists of but is not limited to, waste oil, waste fuel, waste gasoline, hydrocarbon-contaminated sludge, asbestos-containing materials, lead paint and other lead-containing materials, etc. This waste is often improperly packaged and/or in containers of poor condition. Part of QE's business consists of the management and disposal of hazardous waste, and the EWPF is used for that purpose.

Hydrocarbon contaminated water is often collected from spills, remediation sites or from the cleaning process of fuel storage containers. QE is licensed by the Nunavut Water Board (NWB) to collect, store, treat and discharge this water. The water treatment unit (WTU) consists of lined water-holding ponds and tanks, a water/oil separator and a series of filters activated by diaphragm pumps. The contaminated water is stored before treatment. After treatment, confirmatory samples are taken and analyzed for comparison with the discharge criteria included in the NWB Licence. Once laboratory results reveal that the treated water is within criteria, it is discharged at an authorized discharge location at the EWPF.

QE also manages and treats hydrocarbon contaminated soils on-site using biological, chemical, and physical treatment techniques. The contaminated soils are screened (physical treatment) to remove larger, non-contaminated granular materials. The finer materials are then placed on the bio-treatment pad, which is comprised of a lined cell with a series of screened piping, to inject air into, or extract air from, the soils. Amendments are added to the soils to stimulate bacterial activity that, over time, degrades and removes the contaminants from the soils (biological treatment). The treatment pad may also be used for treating soils by chemical oxidation. The rocks obtained from the screening process are washed (physical treatment) to remove adherent fine soil particles then inspected and reused as backfill.

QE is constantly searching for new technologies that could provide better efficiency/time remediation ratios in Arctic climates. On-site monitoring measures implemented by QE consist of monitoring wells, surface water and soil sampling and daily visual inspection of the installations to ensure that no contamination migrates off-site.

To facilitate understanding for readers who may need to focus on individual sections of this document, each section was written concisely but is, however, comprehensive enough to be read individually, at the risk of repeating key information within the document.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACM	Asbestos-containing material
CCME	Canadian Council of Ministers of the Environment
CEPA	Canadian Environmental Protection Act
DND	Department of National Defence
EPP	Environmental Protection Division
EWPF	Environmental Waste Processing Facility
GN	Government of Nunavut
GN DoE	Government of Nunavut Department of Environment
HC	Hydrocarbon
HCW	Hydrocarbon contaminated water
HDPE	High density polyethylene
HW	Hazardous waste
IATA	International Air Transport Association
IMO	International Marine Organization
INAC	Indigenous and Northern Affairs Canada
MSDS	Material Safety Data Sheets
NFC	National Fire Code
NWB	Nunavut Water Board
PCB	Polychlorinated biphenyls
PHC	Petroleum hydrocarbons
PPE	Personal Protective Equipment
ppm	parts per million
SCP	Spill Contingency Plan
SDS	Safety data sheets
TDG	Transportation of Dangerous Goods
TDGA	Transportation of Dangerous Goods Act
TDGR	Transportation of Dangerous Goods Regulation
UN	United Nations
WTU	Water treatment unit

ENVIRONMENTAL PROTECTION PLAN OBJECTIVES

The Environmental Protection Plan (EPP) was developed to provide prevention/control measures for potential environmental impacts associated with the activities at Qikiqtaaluk Environmental Inc's (QE) EWPF. This plan also serves as the basic vehicle for ensuring that efficient and coordinated measures are provided in terms of detection, notification, recording, request for assistance, containment and countermeasures for hazardous materials spills.

The EPP has been implemented and monitored by QE and is used during daily activities in conjunction with the facility's drawings and specifications.

The EPP defines the following:

- **Section 1**: Hazardous waste management, water treatment and soil treatment operations;
- **Section 2**: Environmental legislation and regulations from federal, territorial and municipal authorities and other relevant authorities having jurisdiction;
- **Section 3**: Protection measures required to avoid potential environmental impacts;
- **Section 4**: Emergency plans required to respond to situations which can adversely impact the environment.

The protection measures described in this document shall be implemented by QE to avoid potential adverse environmental impacts. These procedures were developed to take into consideration known and potential situations and conditions. However, if some procedures or protection measures prove to be impractical, imprudent or insufficient in field situations, appropriate modifications will be proposed by QE and approved by the concerned regulatory agency or its representative. A hard copy of this EPP is kept in the QE Site Office where it may be consulted by QE personnel and visitors.

1. PROJECT OVERVIEW

The EWPF covers an approximate area of 19,160 m² and bears the legal description Lot 666, Plan 1673, Parcels Q and O in Iqaluit, Nunavut. It is located in the area designated as West 40, within the boundaries of the City of Iqaluit. It has an M2 zoning classification, which, according to the City of Iqaluit zoning by-law, allows for heavy industrial activities. The Lot is leased from the Government of Nunavut's Department of Economic Development and Transportation. QE has rerouted drainage ditches and restricted public access by installing 6-foot-high metal fencing with 3 rows of barbwire at the top.

The EWPF has four neighbours:

- To the north: A beer brewing company;
- To the west: Sylvia Grinnell Territorial Park and empty industrial lots;
- To the southeast: A DND compound;
- To the east: Industrial lots leased to Hanson Construction Ltd. for cold storage and Wynburg Automotive for vehicle repairs.

An office space and warm storage area have been installed in trailers and insulated marine containers. Heat is provided by an oil-fired furnace. Heating oil is delivered to the EWPF by UQSUQ Corporation, as is standard throughout the City of Iqaluit. Parking spaces and marine containers used for cold storage are also part of the Site's infrastructure.

Clean granular material was added to the site, and it was graded, levelled, and sloped to the east. This allows rain and melting snow to be drained into the City of Iqaluit's current drainage pathways. Snow piling areas are also included to allow for activities to be carried out year-round.

1.1 EWPF Activities

The site activities conform to meet the CCME or territorial environmental laws, regulations, standards and other requirements (whichever is more severe). The following sections describe the major activities to be performed and the applicable environmental requirements. The major activities include the following:

- Hazardous waste management;
- Water treatment;
- Soil treatment.

1.2 Hazardous Waste Management

QE will implement appropriate waste management procedures for all waste collected during operations.

Non-hazardous solid waste generated as part of QE's daily activities will be disposed of in the City of Iqaluit landfill. Non-hazardous materials expected to be encountered include packaging materials, building demolition debris, metals, concrete and other debris.

Hazardous waste (liquids and solids) generated by QE during daily activities will be brought to the EWPF and will be containerized and shipped off-site to authorized facilities in southern Canada.

Hazardous Waste Materials are those designated as "hazardous" or "dangerous goods" under Territorial or Federal legislation or guidelines including the Transport of Dangerous Goods Act (TDGA) or Regulation (TDGR), and the Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations (EIHWHRMR) under the Canadian Environmental Protection Act (CEPA). Specifically identified and/or potential hazardous materials encountered by QE during daily activities include but are not limited to: contaminated soils and water, hazardous building demolition debris, lead amended painted materials, batteries, asbestos-containing debris, fuel tank sludge, solvents, waste fuels and lubricating oils, glycols and bio-hazard waste. The requirements for the disposal of this waste are presented in Table 1, below.

TABLE 1
Hazardous Waste Requirements for Disposal

Description	Management Procedure
• Liquids containing organic compounds with and without heavy metal contamination such as: - Cadmium (Cd) > 2 ppm, - Chromium (Cr) > 10 ppm, - Lead (Pb) > 100 ppm; • Batteries; • Tires.	Consolidation, containerization, temporary on-site storage and off-site shipment to an authorized treatment/disposal facility.
Asbestos	Double bagged and temporary on-site storage and off-site shipment to an authorized treatment/disposal facility.
• Fuels; • Lubricating oils; • Solvents and glycols; • Fuel tank sludge.	Consolidation, containerization, temporary on-site storage and off-site shipment to an authorized treatment/disposal facility.
• Hazardous demolition materials; • Paint, lead-amended paint and paint-related materials	Consolidation, containerization, temporary on-site storage and off-site shipment to an authorized treatment/disposal facility.
Biohazard, medical waste	Biohazard packaged in proper Class 6 containers at hospital or health centres. Containers consolidated in a locked marine container prior to shipment.

Workers shall wear suitable PPE and use appropriate materials and equipment for the management of hazardous materials.

Activities pertaining to liquid/sludge wastes will take place on part of the HDPE lined and bermed multi-purpose containment cell to prevent spills. Contact water will be redirected to the WTU. Materials awaiting packaging will be covered to limit contact water. Adequate segregation and storage will be maintained on-site to avoid incompatible product interaction.

1.3 Water Treatment

In May 2017, QE was awarded an NWB Licence (#1BR-THI1722 / Type "B") to carry out water treatment activities. Under this licence, QE is permitted to collect, store, treat and discharge hydrocarbon-impacted water. Hydrocarbon-impacted water is collected by QE from fuel spill remediations, tank cleaning or liquid waste consolidation activities and is stored in an HDPE lined holding basin and/or steel holding tanks. The steel holding tanks are placed within the HDPE lined and bermed multi-purpose containment cell to provide secondary containment, as stated in the licence conditions. The approximate total holding capacity is 490,000 L. More detailed information on water treatment activities is available in the EWPF Operation and Management Plan.

In September 2017, the NWB approved an amendment to the licence that would allow for the management and treatment of water impacted by contaminants other than petroleum hydrocarbons (e.g., metals and other organic contaminants) as well as modifications to the treated water discharge criteria.

Licence number 1BR-THI2027 was issued in January 2020 for the purpose of deposit of waste. The project licencing history is presented in Table 1 of Appendix B.

1.4 Soil Treatment

Hydrocarbon-impacted soils will be treated on-site using biological, chemical, and physical treatment techniques.

These soils will be temporarily stockpiled on part of the HDPE lined and bermed multi-purpose containment cell referred to as the processing area. The processing area will also be used for physical treatment of soil involving soil screening to remove coarse materials followed by washing of the screening rejects. Water from the washing process will be redirected to the WTU for treatment. Finer soil materials generated by the screening process are further treated by biological and/or chemical techniques.

Hydrocarbon-impacted soils will be treated using biological degradation methods (landfarming or biopile) in a secondary HDPE lined and bermed treatment cell referred to as the treatment area. Biological soil treatment consists of facilitating bacterial activity within contaminated soils to reduce contamination levels to a standardized concentration. Air, moisture and amendments are added to the soils, which are then tilled regularly to provide aeration.

Soil treatment by chemical oxidation using an oxygen source other than air (e.g., hydrogen peroxide, sodium persulfate, sodium percarbonate) may also be conducted in the treatment area.

QE conducts site remediation activities within the City of Iqaluit for soils impacted by hydrocarbons. The contaminated soils that are collected during these remediation projects are then treated to meet the GN DoE *Guideline for Contaminated Site Remediation*.

Table 2, hereinafter, presents the generic contaminated soil remediation criteria that are met for the soil treatment activities.

TABLE 2
Summary of Tier 1 Criteria (mg/kg) for PHCs in Surface Soils

Land Use	Soil Texture	Fraction 1 (C6-C10)	Fraction 2 (> C10-C16)	Fraction 3 (> C16-C34)	Fraction 4 (> C34)
Agricultural/Wildland	Fine-grained soil	210 (170a)	150	1,300	5,600
	Course-grained soil	30b	150	300	2,800
Residential/Parkland	Fine-grained soil	210 (170a)	150	1,300	5,600
	Course-grained soil	30b	150	300	2,800
Commercial	Fine-grained soil	320 (170a)	260 (230a)	2,500	6,600
	Course-grained soil	320 (240a)	260	1,700	3,300
Industrial	Fine-grained soil	320 (170a)	260 (230a)	2,500	6,600
	Course-grained soil	320 (240a)	260	1,700	3,300

Work related to the excavation and disposal of contaminated soils will be completed in accordance with the requirements of the GN DoE.

Should other contaminants such as untreatable chemicals or metals exceeding the applicable criteria be detected in some soils, they will be packaged and shipped to southern Canada for final disposal in approved facilities.

Water that becomes contaminated due to contact with hydrocarbon-contaminated soil at the treatment area is collected in an HDPE lined catchment pond and redirected to the WTU. Further details regarding this process are presented in QE's Operation and Maintenance manual.

2. JURISDICTIONS

2.1 General

QE will comply with applicable federal and/or territorial laws, regulations and requirements. QE will obtain the required permits, approvals and authorizations and will fully comply with said permits and approvals while conducting this work. QE will also work in close collaboration with the GN DoE and all other regulatory authorities having jurisdiction to ensure full compliance which will apply to all EWPF activities.

2.2 Federal Jurisdictions

Several federal acts, regulations, and guidelines, which are applicable across Canada, will affect activities to be conducted at the EWPF. Concerning the activities QE will undertake at the EWPF, the most relevant of the federal acts, regulations and guidelines are described as:

- *Canadian Environmental Protection Act*: controls hazardous substances from their production and/or import, to their consumption, storage and/or disposal. This act also includes procedures to handle specified levels of PCB contaminated materials and requirements for PCB storage facilities;
- *Fisheries Act*: protects fish and their habitat from pollution and disturbance, and also protects fish movement disturbances. Fisheries and Oceans Canada reviews permit applications or restoration plans submitted by other agencies;
- *Transportation of Dangerous Goods Act* and *Regulations*: describe safety measures for TDG. The act applies to all handling of dangerous goods by any means of transport whether the goods originate from or are destined for anywhere in Canada;
- *Interprovincial Movement of Hazardous Waste Regulations*: ensures that the Canadian manifest tracking and hazards classification conditions for waste, formerly set out in the Transportation of Dangerous Goods Regulations, are maintained for the interprovincial movements of hazardous wastes;
- *Canada Wildlife Act*: ensures that the Government of Canada collaborates in the research and management of wildlife species normally under the responsibility of provinces and/or territories. This is particularly relevant for threatened, endangered and/or vulnerable species, such as polar bears and barn swallows, which seasonally move across various regulatory boundaries;
- *Canada Shipping Act* and *Regulations*: provides safety standards and/or pollution prevention and control procedures for shipping activities in Canadian waters;
- *Navigable Waters Protection Act*: relates to all facilities required for navigation in Canadian waters;
- *Canada Labour Act* and *Regulations*: is the labour code which governs all federal employees or activities on Canadian owned or controlled lands. Private, provincial or territory employees are always submitted to such jurisdictions. The labour acts govern minimum wages, statutory holidays, and maximum work hours;
- *National Fire Code*: describes the requirements for fire prevention, safety in buildings, firefighting and the maintenance of fire safety equipment including fire extinguishers. Furthermore, the NFC establishes the procedures for the prevention, containment and fighting of fires originating outside buildings. The NFC also defines sets of standards for the storage and handling of dangerous goods, flammable liquids and combustible liquids.

2.3 Nunavut Jurisdictions

In addition to the federal acts and regulations listed in Section 2.2, the EWPF activities will also comply with the following:

- *Environmental Guideline for the Management of Contaminated Sites* (1999, Rev. 2014). Government of Nunavut, Department of Environment; and,
- *Environmental Guideline for Contaminated Site Remediation*, (1999, Rev. 2009) Government of Nunavut, Department of Environment.

2.4 Other Applicable Jurisdictions

Hazardous waste to be shipped off-site for disposal will be sent to licensed disposal facilities and/or waste handlers who comply with applicable regulations. The Certificates of Authorization for all facilities selected to receive waste originating from the EWPF will be provided upon request.

2.5 Permits

QE has or will obtain the necessary permits, authorizations, certificates and approvals related to the EWPF operations, namely the management of hazardous materials as well as water and soil treatment. Table 3, hereinafter, presents a partial list of these requirements.

TABLE 3
Applicable Permits and Authorizations for the EWPF Activities

Authorizations or Permits	Regulatory Authorities	Activities	Permitting Agencies	Applicant
Development Permit	Iqaluit Zoning By-Law	Land development	Municipality of Iqaluit #DP15-024	QE
Nunavut Water Board License	NLCA[1]	Treatment of Contaminated Water and Soil and Hazardous Waste Management	Nunavut Water Board License #1BR-THI1722	QE
Nunavut Impact Review Board Decision	NLCA[1]	Treatment of Contaminated Water and Soil and Hazardous Waste Management	Nunavut Impact Review Board	QE
Nunavut Planning Commission Decision	NLCA[1]	EWPF development	Nunavut Planning Commission	QE
Transportation Permit	TDGA, IATA[2] Dangerous Goods Act	Sealift and/or air transport of regulated waste	Transport Canada	QE and Subcontractors
Hazardous Waste Management Facility Registration	Department of Environment	Hazardous Waste Management Facility	Department of Environment NUF#400006	QE
Hazardous Waste Receiver Registration	Department of Environment	Hazardous Waste Management Facility	Department of Environment NUR#300001	QE
Land Lease	Government of Nunavut Transportation & Economic Development	EWPF Development	Nunavut Airport Services Ltd.	QE

1 Nunavut Land Claim Agreement
2 International Air Transport Association

3. ENVIRONMENTAL PROTECTION

3.1 Objectives

The procedures and requirements provided hereinafter are intended to protect the environment, ecosystem parameters and human receptors at and immediately surrounding the EWPF. It also describes the measures that will be followed on a yearly basis to provide environmental monitoring of the Site and the procedures to follow if a doubt arises that contamination may have migrated to the environment.

3.1.1 Hazardous Waste Management at the EWPF

In order to avoid environmental impacts, EWPF operations shall require specific procedures and monitoring:

- Workers shall be required to wear suitable PPE while handling hazardous materials;
- Hazardous Waste processing areas shall be properly maintained for safe management;
- The movement of heavy equipment, vehicles and equipment between the processing areas and other worksite locations shall be controlled to prevent cross contamination;
- The hazardous liquid waste processing area shall be constructed with an impermeable liner (HDPE membrane or similar) covered with 0.3 m of fine gravel. In the event of a contaminant spill, the liner will act as a barrier to prevent contamination from escaping the area;
- Contact water shall be redirected to the WTU for treatment and discharge;
- Sources of ignition such as smoking, hot work or torch cutting shall be prohibited within a 5 m radius of the hazardous waste processing area;
- Hazardous liquids shall be stored in suitable containers (e.g., 205 L drum, UN-approved 20 L pail with lid, etc.);
- Hazardous solid waste shall be stored in suitable containers such as wranglers, covered open-top drums or intermodal containers;
- A site-specific Spill Contingency Plan has been developed and is attached to this EPP;
- Firefighting equipment shall be made available for immediate access near the hazardous waste processing area and storage location;
- Drums containing hazardous waste, including waste fuel, shall be identified, labelled and stored in such a way as to prevent spills. Labels shall provide health, safety and environmental information;
- Safety data sheets (SDS) for hazardous products used and stored on the EWPF will be readily available to personnel to consult as required;
- Waste storage facilities shall be inspected a minimum of once a day during business days;
- Emergency spill equipment including fuel pumps, recovery drums, containment booms and other sorbent materials shall be available on-site. QE is responsible for informing the fire department of stored waste so that they may respond appropriately in case of an emergency and for maintaining enough equipment on-site to clean up a 1,000 L spill in the hazardous waste storage area (see the Spill Response Procedure presented in Section 4);
- A detailed inventory will be kept and made available to emergency response crews.

3.1.2 Transportation of Hazardous Waste

- The operators of equipment used to transport waste will be experienced, trained and licensed;
- When required, waste shall be shipped off-site in accordance with the following:
  - provisions from the TDGA, as well as the IMO and the IATA dangerous goods regulations,
  - waste shall be packaged according to requirements specified in the TDGR,
  - the prescribed documents shall be obtained and accompany materials classified as hazardous by the TDGA. These documents shall provide the names and addresses of the shipper (generator), consignee (receiver) and carriers;
- Specific provisions for hazardous waste in quantities exceeding 5 kg or 5 L, and for waste containing PCBs over 50 ppm, shall apply as follows:
  - QE shall complete a waste manifest for each shipment. This document shall follow the shipment to its final destination,
  - the origin and destination of the shipment shall be defined. The nature and quantity of dangerous goods shall also be given (shipping name, classification, UN number, packaging group, subsidiary risk, number and kind of packaging, and gross weight),
  - manifests shall be transmitted by the shipper to the initial carrier. When dangerous goods arrive at their final destination, the receiver shall send, within 2 working days, a signed copy of the manifest to the shipper;
- Unknown waste that may require off-site shipment shall be characterized according to regulations to determine whether it must be considered as a transport hazard;
- Hazardous waste to be shipped off-site shall be packaged in accordance with the TDGA, IMO and IATA regulations, which define criteria based on risk;
- Containers to be shipped off-site must be labelled as follows:
  - packages shall be identified according to the hazardous item's class and division. It should be noted that requirements may differ between the IATA, IMO and TDGA regulations. Label or placard designs are unique to each classification,
  - packages shall be labelled on a minimum of 2 sides of the container, and the nature of the dangerous goods shall be clearly identified on the label (i.e., shipping name, UN number, classification, packaging group);
- Materials that exceed the CEPA criteria shall be containerized in selected rigid sided containers that comply with the TDGA and shall be stored at the temporary staging area;
- Liquids (including water) resulting from the cleaning (i.e., decontamination) of equipment and heavy machinery used in the waste processing areas shall be contained, tested and treated, as per regulations;
- Hazardous waste shall be treated and disposed of in accordance with regulations;
- Hazardous liquid and solid waste shall be removed and placed in storage containers for shipment to an authorized disposal facility.

3.1.3 Water Treatment

Water treatment activities are governed and regulated through QE's NWB Licence. The main mitigation and safety measures are:

- Treated water must meet the discharge criteria. A sample of water (THI-1) will be collected per batch of treated water and analysed for the parameters included in the licence;
- Treated water discharge location must meet the Licence specifications and be approved by an INAC field officer;
- INAC field officer must be given a minimum of 10 days' notice before every discharge event.

3.1.4 Soil Treatment

Petroleum hydrocarbons-contaminated soils will be treated on-site using physical, biological and chemical soil treatment techniques. The following measures are followed to avoid contaminant migration:

- Containment cells, including both processing and treatment areas, shall be watertight and lined with a minimum 30 mil thickness HDPE liner or similar, covered and underlain by a protective geotextile liner;
- The processing and treatment areas are composed of a containment cell, as described above, which is further protected by a 0.3 m thick layer of fine gravel;
- A water collection pond lined as above shall be located at the lowest point of the processing and treatment areas;
- The processing and treatment areas, as well as water collection ponds, will be composed of the same watertight liner, thus avoiding contaminants from escaping while soils are being processed;
- The outer edge of the entire processing and treatment areas will be composed of an elevated berm (minimum of 0.3m above grade) to prevent loss of soil or water;
- Precipitation runoff water accumulating in the collection ponds will be reused as part of the soil treatment process; any excess water will be redirected to the WTU to be treated and discharged;
- Visual inspection of the containment cells will occur every business day;
- Upon completion of a soil treatment batch, soil sample laboratory results confirming that quality criteria are met will be submitted to GN DoE. Only upon receipt of approval from the regulatory agency will QE remove the soils from the treatment pad.

It must be noted that biological soil treatment does not generate a deposit of waste, since the contaminated soil is separated from the clean soil underneath by the watertight liner. Biological soil treatment activities will not require the use of water from an external source. Water collected in the collection pond may be reused to moisten the soils, as required. No other source of water will be used.

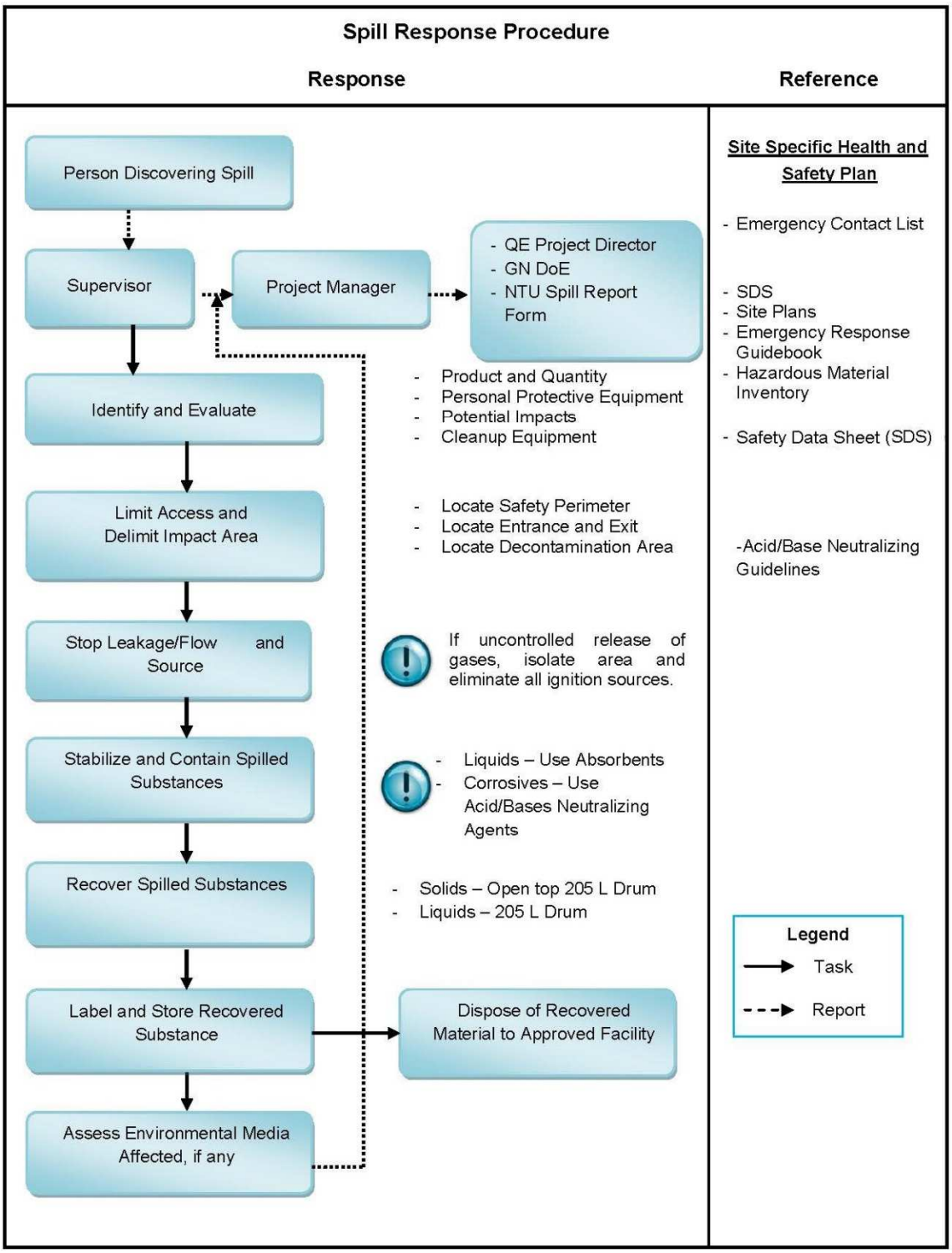
3.1.5 Site Monitoring

In order to ensure that the EWPF activities do not have a negative impact on the surface waters near the EWPF area, a water monitoring program will be conducted.

- Groundwater monitoring wells are installed around the site, one upgradient and 3 downgradient of the operations. Water samples are collected once per year, at the end of August, and analyzed at a certified laboratory;
  - Coordinates of the monitoring wells are as follows (see Figure 1 of Operations and Maintenance manual) for a plan showing monitoring wells locations):
    - Monitoring Well and soil monitoring control area upgradient (THI-4a/ THI-4b): 63°44’38’’ N, 68°33’00’’ W,
    - Monitoring Well and soil monitoring control area downgradient of the treatment area (THI-5a/ THI-5b): 63°44’35’’ N, 68°32’58’’ W,
    - Monitoring Well and soil monitoring control area downgradient of multi-purposed containment cell (THI-6a/ THI-6b): 63°44’37’’ N, 68°32’55’’ W,
    - Soil monitoring control area downgradient of multi-purposed containment cell (THI-7): 63°44’39’’ N, 68°32’53’’ W;
- Surface water from the ditches will be sampled at 2 locations on a yearly basis, at the end of August. One sample of surface water upgradient of the EWPF and one sample downgradient will be collected and analyzed at a certified laboratory;
  - Coordinates of the water quality sampling locations are as follows:
    - Upgradient of the EWPF (THI-2): 63°44’38.82’’N, 68°33’2.45’’W,
    - Downgradient of the EWPF (THI-3): 63°44’39.27’’N, 68°32’52.00’’W;
- Sampling will also be done at the treated discharge location THI-1a for water and THI-8 for soil monitoring;
- The water samples collected as part of the water monitoring program will be analysed for the parameters included in the licence.

4. SPILL RESPONSE PROCEDURES

The spill response flowchart to be followed by QE personnel upon discovery of a hazardous waste spill is presented below. A complete Spill Contingency Plan has been prepared and is available in Appendix A.



APPENDIX A

Spill Contingency Plan

SPILL CONTINGENCY PLAN

ENVIRONMENTAL WASTE PROCESSING FACILITY

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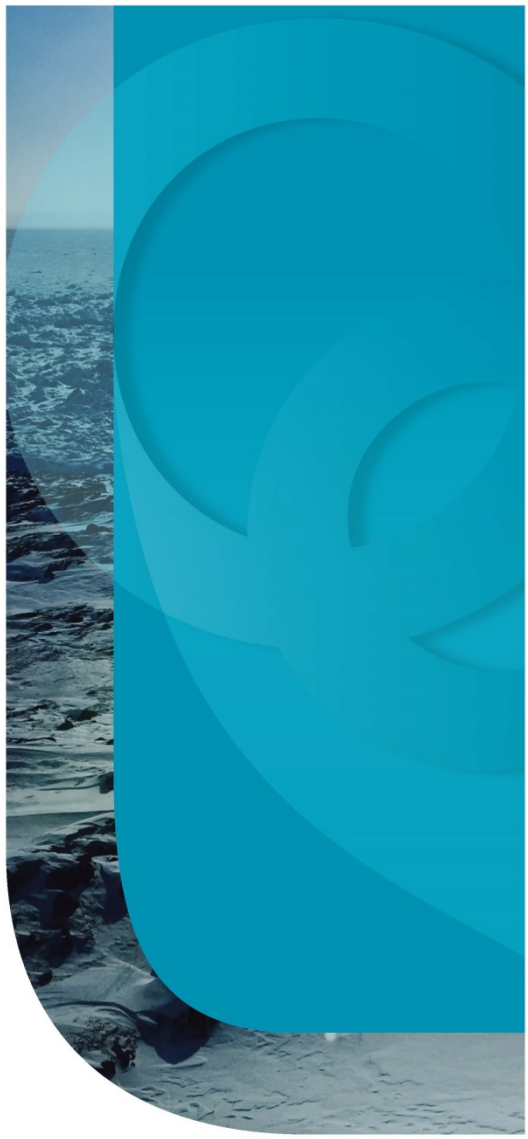

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Spill Contingency Plan

Environmental Waste Processing Facility

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Director

Qikiqtaaluk environmental
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PREAMBLE

This Emergency and Spill Response Plan for the Environmental Waste Processing Facility in Iqaluit has been in effect since the start of operations, and applies to all related activities on-site.

The Plan is updated and reviewed, as necessary, if operations are modified, or if the type and quantity of stored waste changes.

Formal distribution of the Plan is made to:

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Additional copies and updates of this Plan may be obtained from:

Qikiqtaaluk Environmental Inc.
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Refer to Table 2 for additional contact information.

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1. INTRODUCTION

The spill contingency plan was developed to assist Qikiqtaaluk Environmental Inc. (QE) with implementing measures to protect the environment and minimize impacts resulting from spill events. It provides precise instructions with which all personnel shall be familiar during emergency spill response situations. This plan outlines procedures for responding to spills while minimizing potential health and safety hazards, environmental impacts, and clean-up costs.

This spill contingency plan is required as part of the implementation of an Environmental Waste Processing Facility (EWPF) in Iqaluit, Nunavut. The following activities will be conducted at the EWPF:

- Receiving and handling (loading and unloading) waste materials contained primarily in 205 L drums;
- Consolidation of small containers (cans, bottles, pails, etc.) into larger containers (drums, waste wranglers) to form labpacks;
- Storage of waste drums and wranglers placed outdoors in the temporary liquid waste storage area or 20 ft marine containers;
- Crushing of fluorescent tubes using specialized equipment;
- Puncturing and drainage of aerosol cans using specialized equipment;
- Placement of drums and wranglers on pallets and packaging according to maritime transport regulations;
- Treatment of contaminated water through a water filtration unit;
- Treatment of hydrocarbon-impacted soils using physical, chemical and biological techniques.

The EWPF is located at 2027 Iqaluit Lane, in Iqaluit, more specifically: Lot 666, Plan 1673, Parcels O and Q (central point coordinates in decimal degrees: $63^0$44’38.22” N, $68^0$32’58.59” W). A drainage ditch is located along the lot limits of the EWPF. Drainage ditches flow into the City of Iqaluit’s municipal drainage pathway which, in time, flows toward the ocean, approximately 700 m from the Site. Figure 1, on the following page, presents a general overview of the EWPF site.

Waste management activities take place in areas designed to control run-off or contact water, minimize contaminant dispersion, and contain accidental spills. A large lined water collection pond is available to store possibly contaminated water or snow from a spill or incident. Surface drainage water is directed in such a way that it can be controlled with silt fences, sorbent booms and/or easily contained before reaching the drainage ditch.

FIGURE 1 Location of the Environmental Waste Processing Facility

Source:Google Maps, 2017

The spill contingency plan was implemented to ensure that the EWPF complies with applicable laws, regulations and requirements of authorities having jurisdiction. QE will obtain and comply with the permits, approvals and authorizations required for the operations. The following applicable regulations and documents constitute an integral part of the spill contingency plan:

- Federal Legislation:
  - The *Canadian Environmental Protection Act*[1] controls hazardous substances from their production and/or import, their consumption, storage and/or disposal;
  - The *Nunavut Waters and Nunavut Surface Rights Tribunal Act*[2] provides for the conservation and utilization of waters in Nunavut, in a manner that will provide the optimum benefit for the residents of Nunavut;
  - The *Northwest Territories Waters Regulations*[3] requires that every licensee maintain accurate and detailed books and records, to be submitted to the Board each year, stating the quantity of water used under the licence as well as the quantity, concentration and type of any waste deposited;
  - The federal *Transportation of Dangerous Goods Act*[4] and *Regulations*[5] ensure the protection of public health and safety, and the environment during the handling and transport of dangerous goods. The Regulations apply to all modes of transportation, by road, by sea, and by air.
- Territorial Legislation:
  - The Government of Nunavut *Environmental Protection Act*[6] governs the protection of the environment from contaminants. The act defines offences and penalties as well as the powers of government inspectors.
- Guidelines and Policies:
  - The CCME[7]:
    - *Code of Practice for Used Oil Management*[8]: defines appropriate environmental options for the handling, storage, collection, recycling, transport, re-use and/or disposal of used oils in Canada. It helps regulatory authorities formulate provincial and/or regional strategies for used oil management,
    - CEQG[9]: establishes the guideline values for contaminated soils,
    - CWQG[10] for the Protection of Aquatic Life: establishes the guideline values for contaminated water;

1 Canadian Environmental Protection Act (S.C. 1999, c. 33)
2 Nunavut Waters and Nunavut Surface Rights Tribunal Act (S.C. 200, c. 10)
3 Northwest Territories Waters Act)S.C. 1992, c. 39)
4 Transportation of Dangerous Goods Act (S.C. 1992, c. 34)
5 Transportation of Dangerous Goods Regulations (SOR/2001-286)
6 Environmental Protection Act (R.S.N.W.T. 1988, c.E-7)
7. Canadian Council of Ministers of the Environment
8 *Code of Practice for Used Oil Management in Canada*, Canadian Council of Ministers of the Environment, CCME-TS/WM-TRE—6E, August 1989
9 Canadian Environmental Quality Guidelines
10 Canadian Water Quality Guidelines

- The *Guidelines for the Preparation of Hazardous Material Spill Contingency Plans*[1] describes parameters that should be considered in the development of hazardous materials spill emergency plans. It also defines the information that should be incorporated into a comprehensive contingency plan;
- The *Nunavut Spill Contingency Planning and Reporting Regulations*[2] describe the requirements for spill reporting and emergency planning;
- The *Land Transportation Emergency Response Guideline for Petroleum Spills*[3] developed by the Canadian Petroleum Products Institute outlines the scope, emergency response code of practice, response time guidelines, response equipment and personnel capability requirements.

1 *Guidelines for the Preparation of Hazardous Material Spill Contingency Plans*, Environment Canada, 1990
2 Spill Contengnecy Planning and Reporting Regulations, July 15, 1998
3 *Land Transportation Emergency Response Guideline for Petroleum Spill*, Canadian Fuels Association, January 2013

2. HAZARDOUS MATERIALS – TRANSPORT AND STORAGE

Several types of hazardous waste will be managed at the EWPF. Quantities remaining in storage will be minimal after the last sealift of the season (i.e. October) and will increase throughout the winter season, to reach maximum capacity before the first sealift of the season (i.e. July).

Furthermore, as part of the soil treatment process, sodium persulfate (a solid oxidizing agent) may be used and therefore stored on-site before use. Because of its oxidizing properties, the sodium persulfate bags will be segregated from flammable and combustible waste products, and stored in a separate storage container.

In order to prevent dangerous reactions between incompatible materials, hazardous materials and waste will be stored in compliance with general chemical segregation rules.

Table 1, hereinafter, presents the approximate maximum quantities of hazardous products and waste materials that will be present at the transfer station before the first sealift of the season.

The safety data sheets (SDS) for the products stored on-site can be found in the SDS binder, located in the QE Site Office.

TABLE 1
Estimated Maximum Materials Storage Capacity

Shipping Name	Description	TDG[1] Class	Maximum Storage Capacity	Type and Number of Containers
Waste lubricating oil	Used oil	N/A	32,000 L	160 drums or 32 tote tanks or any combination of both
Waste glycol	Waste antifreeze	N/A	19,200 L	96 drums or 19 tote tanks or any combination of both
Oily water (and snow)	Water and PHC[2] mixture	N/A	10,000 L	10,000 L open tank
Batteries, wet, filled with acid	Vehicle batteries	8	6,800 kg	10 battery packs
Batteries, dry, containing potassium hydroxide, solid	Small batteries	8	800 kg	4 drums
Paints and paint-related materials	Paints, thinner	3	16,000 kg	15 waste wranglers
Flammable liquids, not otherwise specified (gasoline)	Various petroleum products mixtures	3	32,000 L	160 drums
Oily contaminated solids (rags, absorbents, filters)	Oily solids	N/A	7,200 kg	32 drums
Hydrocarbon contaminated soil	Oily soils	N/A	3,000 m^3	Covered containment cells
Environmentally hazardous substances, solids, not otherwise specified (mercury)	Crushed fluorescent light tubes and bulbs	9	2,400 kg	11 drums
Propane	Propane tanks	2.1	800 kg	Bulk storage
Butane	Butane tanks	2.1	400 kg	4 waste wranglers
Acetylene	Gas cylinders	2.1	800 kg	Bulk storage
Oxygen	Gas cylinders	2.2 (5.1)	800 kg	Bulk storage
Helium	Gas cylinders	2.2	800 kg	Bulk storage
Argon	Gas cylinders	2.2	800 kg	Bulk storage
Aerosols	Aerosol cans, paint/solvents	2.1	2,000 kg	10 waste wranglers
Aerosols	Aerosol cans, oven cleaner	2.2 (8)	2,000 kg	10 waste wranglers
Organic solids, toxins, N.O.S.[3] (medication)	Spent medication	6.1	200 kg	1 drum or 10 pails
Sodium persulfate	Soil treatment oxidizing agent (solid)	5.1	2,000 kg	25 kg bags stacked on pallets
Biomedical waste	Medical sharps	6.2	5,000 kg	7,500 UN[4]-approved sharps containers (5 L each)

1 Transportation of Dangerous Goods
2 Petroleum hydrocarbons
3 Not otherwise specified
4 United Nations
N/A Not applicable

Notes: Pails are assumed to be high-density polyethylene (HDPE), 20 L capacity
Drums are assumed to be steel, 205 L capacity
Tote tanks are assumed to be HDPE, 1,000 L capacity
Bulk bags are assumed to be 1 yd^3 (approximately 750 L) capacity
Waste wranglers (Quatrex bags) are assumed to be 1 yd^3 (approximately 750 L) capacity
Battery packs are assumed to be 0.5 yd^3 (approximately 380 L) capacity

The largest single storage container used for TDG[1]-regulated liquid waste, such as Class 3 flammable liquids, is the 340 L open-top steel salvage drum.

The largest single storage container used for non-TDG regulated liquid waste, such as waste oil and antifreeze, is the 1,000 L HDPE[2] tote tank with steel frame and pallet.

Solid waste, which is non-spillable, will be stored in either:

- 20 L open-top HDPE pails, with lid and gasket;
- 205 L or 340 L open-top steel drums, with lid and gasket;
- 0.75 m^3 waste wranglers made of woven polypropylene with reinforced sides and 6 mil inner liner;
- 0.75 m^3 bulk bags made of woven polypropylene with a 6 mil inner liner;
- 3.75 m^3 doubled bulk bags made of woven polypropylene with a 6 mil inner liner.

Emergency spill response equipment (i.e. spill kits) will be available at the EWPF. The spill kits will be regularly inspected and maintained. Spill kits will contain the appropriate type, size and quantity of equipment for the volume and type of product present at the storage location, as well as the environment likely to be affected by a spill (i.e. ground).

1. Transport of dangerous goods
2 High-density polyethylene

3. DUTIES AND RESPONSIBILITIES

As part of the emergency spill response plan, QE is responsible for implementing, through its management team, the following procedures:

- Train Site personnel in spill response procedures and the proper use of response equipment and materials;
- In the event of a spill, mobilize all available Site personnel, equipment and tools, as required;
- Implement all required health and safety procedures at the spill location;
- Eliminate all fire hazards and potential ignition sources near the spill area;
- Control the source of the spill (i.e. reduce or stop product discharge);
- Contain the spilled product using the most appropriate methods and equipment (i.e. dykes, ditches, sorbent materials, containment booms, and other barriers);
- Evaluate the possibility of recovering the spilled materials;
- Obtain, if required, assistance from government agencies such as the Government of Nunavut Department of Environment (GN DoE) and/or Environment and Climate Change Canada;
- Comply with all applicable guidelines and regulations;
- Conduct a preliminary assessment of the environmental impacts;
- Within 24 hours of the event, report the spill to the Government of Nunavut Spill Report Line and submit a written spill report using the appropriate form (see below for the list of information required in the report).

Table 2, below, presents the management team responsible for overseeing emergency spill response operations and their contact information.

TABLE 2
QE Management Contact Information

Position	Contact
Olivier Simard / Chase Perry EWPF Manager	Mobile: 867 222-8194 **(24 hrs)**
Jennifer Godin EWPF Director	Office Tel.: 450 466-2123, ext. 127 Mobile: 514 207-0667 **(24 hrs)**
On-Duty Environmental Technician Hazmat Specialist	Mobile: 867 222-3246
Harry Flaherty Corporate Contact – President	Office Tel.: 867 979-8406 Mobile: 867 222-1713

As part of the spill response plan, the On-Duty Environmental Technician, acting as incident commander, is responsible for implementing the following procedures:

- Assume authority over the spill scene and the personnel involved;
- Activate the Spill Response Plan;
- Evaluate the initial situation and assess the magnitude of the spill;
- Develop an overall plan of action;
- Report to the EWPF Manager and provide recommendations regarding resource requirements (additional manpower, equipment, materials, etc.) to complete the clean-up effort. The responsibility of the On-Duty Environmental Technician is to mobilize personnel and equipment to implement the clean-up.

The responsibilities of the EWPF Manager, with support from the EWPF Director, include the following:

- Report the spill to NT-NU 24 hour Spill Report Line at (867) 920-8130;
- Act as a liaison with Management to keep them informed of clean-up activities;
- Obtain additional required resources not available on-site for spill response and clean-up;
- Act as the spokesperson with government agencies as well as the public and the media, as appropriate;
- Document the cause of the spill and effectiveness of the clean-up effort, and implement the appropriate measures to prevent a recurrence of the spill;
- Prepare and submit follow-up documentation required by appropriate regulators;
- Ensure that the spill is cleaned up and all follow-up communications and reports are filed with the GN DoE and Environment and Climate Change Canada offices.

The responsibilities of the EWPF Director include the following:

- Work with the EWPF Manager on regulatory follow-up, as necessary;
- Act as the spokesperson with the government agencies, as well as the public and media, on any significant spill events.

Once a spill event has been reported, the EWPF Manager will establish a specific strategy for containing and controlling the spill and initiate the clean-up activities. The On-Duty Environmental Technician, as well as other external resources such as the Iqaluit Fire Department and GN DoE, may act as technical advisors prior to and during the intervention. The trained Spill Response Team will conduct all emergency spill response operations under the leadership of the EWPF Manager. During the clean-up phase of the intervention, other site personnel (e.g., heavy equipment operators, labourers, etc.) may be involved in the intervention. Figure 2 presents an organizational chart of the Spill Response Team.

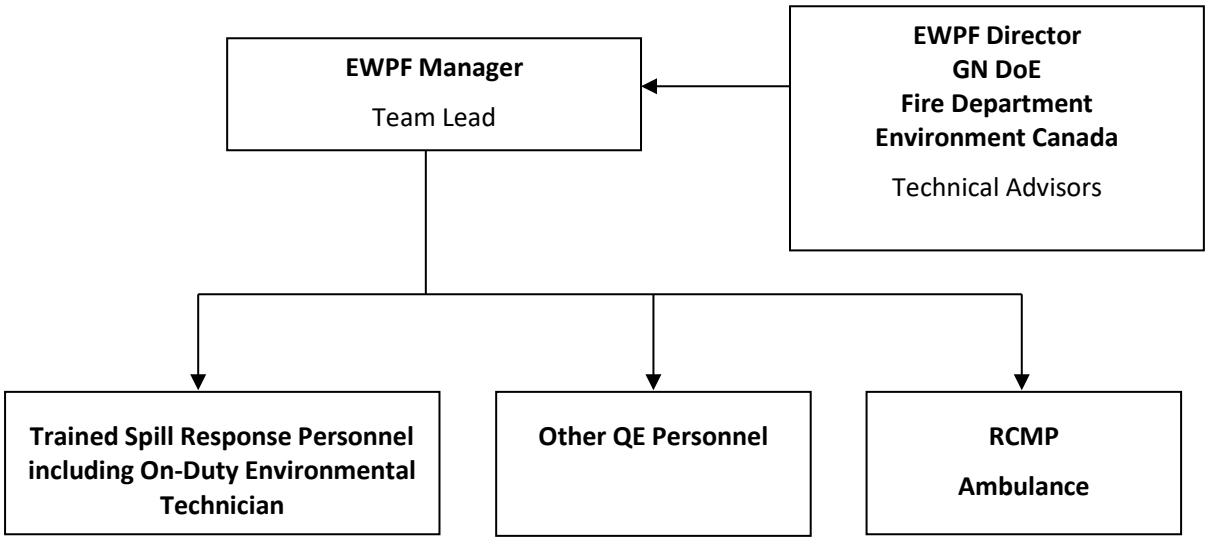


FIGURE 2 Spill Response Team Organizational Chart

QE will ensure that all contracted maritime shipping companies possess a spill contingency plan to respond to spill events during operations. When shipping hazardous materials to and from the EWPF, transport companies are required to carry out their operations in accordance with federal and international regulations (i.e. TDGR-Clear language, IMDG[1], IATA[2]).

During transport, in the event of a hazardous materials spill exceeding the quantities listed in Part 8.1 (1) of the TDGR, the shipping company will immediately report the incident to the RCMP and Nunavut Emergency Management at 1 800 693-1666 (as stated in Part 8.1 (5), TDGR). The immediate report must include as much of the information listed in Part 8.2 of the TDGR as is known at the time of the report. A follow-up report must be made, in writing, to the Director General within 30 days following the occurrence of the accidental release, the “dangerous goods accident” or the “dangerous goods incident”. The follow-up report must include the information listed in Part 8.3 of the TDGR.

If a spill occurs during transport on water or during the transfer of hazardous materials from ship to land, the shipping company will be responsible for implementing the appropriate spill response measures in accordance with their spill contingency plan.

1. International Maritime Dangerous Goods
2. International Air Transport Association

4. TRAINING AND DRILLS

Site personnel shall be informed that any spill of hazardous liquids or solids, whatever the extent, must be immediately reported to the EWPF Manager.

The EWPF Manager will select a certain number of workers to form the Spill Response Team. Crew members will be trained in emergency spill response procedures and operations. Training will include knowledge of the following:

- Properties of the hazardous materials stored on-site;
- Common causes of spills;
- Environmental effects of spills;
- Worker health and safety during emergency interventions;
- PPE[1] and clothing;
- Spill response procedures and techniques on land and snow, and during all 4 seasons;
- Spill response equipment and materials.

Training will also include the analysis of potential spill events that are more likely to occur during waste management operations. Spills are more likely to be caused by:

- Human error during the handling of a hazardous product and waste containers; or
- Rupture of containers due to accidental damage, deterioration or equipment failure.

Training will include classroom training and spill response drills.

1. Personal protective equipment

5. MATERIALS AND EQUIPMENT

To prevent spills and provide an adequate response in the event of a spill, QE will maintain on-site the appropriate types and quantities of response equipment and materials.

To facilitate immediate first response in the event of a fluid release on land, 2 spill kits will be strategically placed in the waste container handling areas. The contents of the spill kits are listed in Table 3, below.

TABLE 3
Spill Kit Contents

Spill Kit	Contents	Quantity
Q Ultra 75 Hydrophobic 140-gallon capacity	75-gal yellow metal overpack drum	1
	12 oz 15” x19” sorbent pads	100
	3” x 4 ft sorbent socks	15
	5” x 10 ft sorbent booms	4
	25 lb granular sorbent	1
	Shovel	1
	30” x 60” x 6 mil disposal bags	5
	Epoxy sticks	2
	Coverall and boot covers	2
	Pair of safety goggles	2
	Pair of gloves	2

In addition to the spill response materials listed above, an excavator and dump truck are available to assist with spill response and recovery efforts.

6. SPILL RESPONSE PROCEDURES

A spill is defined as the discharge of a hazardous product out of its containment and into the environment. Potentially hazardous to humans, vegetation, and wildlife, they vary in severity, depending on several factors including: the nature of the material, the spill quantity, the location and season. Waste petroleum products (waste oils, waste fuels, oil-based paints) are the main group of waste material that may be spilled; therefore, spill response procedures will focus on this type of hazardous material.

Site personnel will be briefed on the procedures to be followed to report a spill and initiate spill response. The first person to notice a spill will take the following steps:

1. Immediately warn other personnel working near the spill area;
2. Evacuate the area if the health and safety of personnel is threatened;
3. Notify the EWPF Manager, who will initiate the spill response operations;
4. In the absence of danger, and before the spill response team arrives on the scene, take any safe and reasonable measures to stop, contain and identify the nature of the spill.

All spill response interventions carried out by the spill response team will follow these general procedures:

- **Source Control:** Reduce or stop the flow of product without endangering anyone. This may involve very simple actions such as sealing a puncture hole with whatever is at hand (e.g., a rag, a piece of wood, tape, etc.), repositioning a leaking container such that the puncture hole is facing up, or transferring fluid from leaking containers;
- **Control of Free Product:** Prevent or limit the spread of the spilled material. Accumulate/concentrate the spilled product in an area to facilitate recovery. Barriers positioned downgradient of the spill will slow or stop the progression of the spill. Barriers can consist of absorbent booms, dykes, berms, or trenches dug into the ground;
- **Protection:** Assess the potential dangers of the spill to protect sensitive ecosystems and natural resources. Contain or divert the spilled material away from sensitive receptors. This can also be achieved by using varying types of barriers;
- **Clean-up the Spill:** Recover and containerize as much free product as possible. Recover and containerize/treat contaminated soils, water, and snow;
- **Report the Spill:** Provide basic information such as the date and time of the spill, the type and amount of product discharged, the location and approximate size of the spill, the actions already taken to stop and contain the spill, the meteorological conditions, and any perceived threat to human health or the environment. Reporting requirements are presented in Section 8 of the present document.

Specific response procedures for spills on land and snow are presented in the following sections. Because the containers used to store liquids are of relatively small volume (205 L and 1,000 L), and because of the mitigation measures to be implemented to control surface drainage, any liquid spills will likely not reach any drainage ditches. As such, response to spills on water is not discussed in this Plan.

Procedures will vary depending on the season.

The spill response flowchart is presented in Appendix A.

6.1 Spills on Land

Response to spills on land will include the previously detailed general procedures. The main spill control techniques involve the use of 2 types of barriers: dykes and trenches. Barriers should be placed on the downgrade (down slope) from the source of the spill, and as close as possible to the source of the spill. Barriers will slow the progression of the petroleum product and will also serve as containment to allow recovery of the fluids.

Depending on the volume spilled, the site of the spill, as well as available materials, a dyke may be built using soils, booms, lumber, snow, etc. A plastic liner should be placed at the foot of and over the dykes to protect the underlying soils, or other materials, and to facilitate recovery of the fuel. Construct dykes in such a way as to accumulate a thick layer of free product in a single area (V- or U-shaped).

Trenches are useful in the presence of permeable soils, and when the spilled fluid is migrating below the ground surface. A plastic liner should be placed on the downgrade edge of the trench to protect the underlying soils. Liners should not be placed at the bottom of the trench so as to allow water to continue to flow underneath the layer of floating oil.

The use of large quantities of absorbent materials to recover significant volumes of oil should be avoided. Large volumes of free product shall be recovered, as much as possible, using vacuums and pumps, then containerized. Mixtures of water and oil may be processed through an oil-water separator. Absorbent sheets should be used to soak up residual oil on water, on the ground (soils and rock), and vegetation. Peat moss may also be sprinkled on vegetation to absorb films of petroleum products.

6.2 Spills on Water

Although rare, since the only water on the site is located in the ditches, response to spills on water will include the previously detailed general procedures. More specifically, an absorbant berm will be constructed to contain the spill and allow for the recovery of fluids.

6.3 Spills on Snow

In general, snow and ice will slow the movement of hydrocarbons. The presence of snow may also hide the oil slick and make it more difficult to follow its progression. Snow is generally a good natural sorbent, as hydrocarbons tend to be soaked up by snow through capillary action. However, the use of snow as a sorbent material shall be limited as much as possible. Snow and frozen ground will also prevent hydrocarbons from migrating into soils, or at minimum slow the migration process.

Response to spills on snow and ice will include the previously detailed general procedures. Most response procedures for spills on land may be used for spills on snow and ice. The use of dykes (i.e. compacted snow berms lined with plastic sheeting) will slow the progression of the oil, and will also serve as a containment to recover the oil.

Free product shall be recovered using a vacuum, a pump, or sorbent materials. Contaminated snow and ice will be scraped up manually or using heavy equipment, depending on volumes. The contaminated snow and ice will be placed in containers. Once melted, the oily water will be processed through the Water Treatment Facility.

6.4 Disposal of Spilled Materials

Steel drums and waste wranglers will be used to contain used sorbent materials for transport by sealift to an authorized disposal facility in the south.

7. POTENTIAL SPILL ANALYSIS

To prepare for emergency spill response, a potential spill analysis was conducted on various "worst case" scenarios. The exercise serves to identify potential risk areas, as well as determine the fate of spilled products and their environmental effects. For the EWPF, 2 potential spill scenarios were identified:

- Tote tank spill; and
- Vandalism spill.

These 2 spill scenarios are analyzed in detail, below.

Scenario #1: Tote Tank Spill

Description of incident: The contents of a tote tank containing waste oil spilled on the ground while being transferred from the storage container to a flatbed trailer using heavy equipment. Oil spilled by gravity. Spill occurs in the storage yard.

Potential causes: Tote tank drops from a height of 5 ft (1.5 m), human error, accident.

Hazardous products spilled: Waste oil.

Maximum volume spilled: 1,000 L.

Estimated time to spill entire volume: 5 minutes.

Immediate receiving medium: Soil.

Most probable direction of oil slick migration: As the ground has a slight slope towards the east, the spill should slowly flow towards the east.

Distance and direction to nearest receiving body of water: Drainage ditch (along property limits) located 65 m to the east.

Estimated emergency spill response time: 5 minutes after spill is noticed.

Spill response procedures: Generally, contain and recover oil spilled on the ground using dykes or booms as described in Section 6.1. Prevent the oil from reaching the drainage ditches. Collect free product for temporary storage. Excavate contaminated soils and/or snow, store and manage appropriately.

More specifically, an oil spill, flowing toward the east, will be intercepted by the access road (to the east of the site) which is at a higher grade than the natural ground surface. A dyke or boom placed perpendicular to the road will act as a low point to collect the free product before it reaches the drainage ditch.

Scenario #2: Vandalism Spill

Description of incident: Spill on the ground of part of the contents of 4 tote tanks containing waste oil caused by loader forks puncturing tote tanks. Oil spilled by gravity. Spill occurs in the storage yard.

Potential causes: Vandalism by a disgruntled worker.

Hazardous products spilled: Waste oil.

Maximum volume spilled: 2,000 L.

Estimated time to spill entire volume: 10 minutes.

Immediate receiving medium: Soils.

Most probable direction of slick migration: As the ground has a slight slope toward the east, the spill should slowly flow toward the east in a plume shape.

Distance and direction to nearest receiving body of water: Drainage ditch (along property limits), located 65 m to the east.

Estimated emergency spill response time: 5 minutes after spill is noticed.

Spill response procedures: Plug 8 puncture holes with rags, absorbent sheets, duct tape, etc. Contain oil spill on the ground and recover using dykes or booms as described in Section 6.1. Prevent the oil from reaching the drainage ditches. Collect free product for temporary storage. Excavate contaminated soils and/or snow, store and manage appropriately.

More specifically, an oil spill, flowing toward the east will be intercepted by the access road (to the east of the site) which is at a higher grade than the natural ground surface. A dyke or boom placed perpendicular to the road will act as a low point to collect the free product before it reaches the drainage ditch.

8. REPORTING REQUIREMENTS

Quantities of spilled hazardous substances requiring reporting are listed in Schedule B of the Nunavut Spill Contingency and Reporting Regulation. For example, for all flammable liquids (Class 3), spills of volumes equal to or greater than 100 L (half a drum) require reporting.

After the initial field emergency response to the spill event, the spill will be reported to the 24-hour Spill Report Line:

24-Hour Spill Report Line

Tel. 867 920-8130

or

Fax: 867 920-8127

Failure to report a spill can lead to fines. It is the responsibility of the EWPF Manager to prepare the proper reports and transmit them to the regulatory authorities. Table 4 presents an additional contact list for spill reporting.

TABLE 4
Contact List for Spill Reporting

Department	Contact Person	E-mail	Telephone
GN DOE[1]	-	-	867 975-7726
Fire Department (General) Fire Department (Emergency)	-	-	867 979-5655 867 979-4422
RCMP - Iqaluit	-	-	867 979-0123
Ambulance	-	-	867 979-4422
CIRNAC[2]	-	-	1 800 567-9604

1 Government of Nunavut Department of Environment
2 Crown-Indigenous Relations and Northern Affairs Canada

After, the spill event must be reported in writing using the standard Spill Report Form presented in Appendix B.

The written report will include the following information:

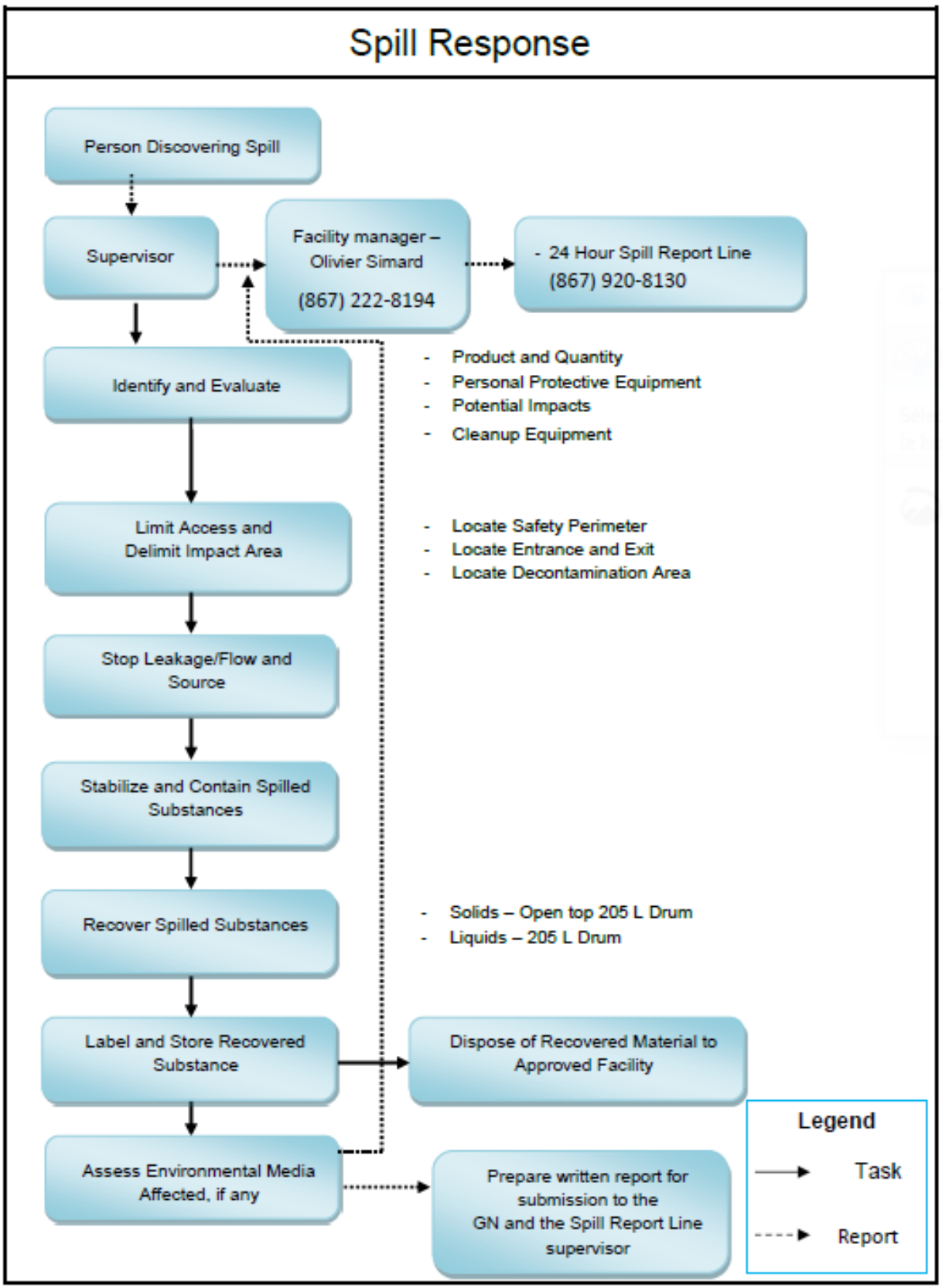
- Date and time of the incident;
- Location or map coordinates and direction of spill movement, if not at steady state;
- Party responsible for the spill;
- Type and estimated quantities of spilled contaminant(s);
- The specific cause of the incident;
- Status of the spill, indicating if spilled materials are still moving or now at steady state;

- Approximate surface area of the contaminated zone;
- Factors affecting spill or recovery, such as temperature, wind, etc.;
- Status of containment actions, indicating whether:
  - Naturally;
  - Booms, dykes or other;
  - No containment has been implemented;
- Corrective action taken, or proposed, to clean-up, contain or dispose of the spilled materials;
- Whether assistance is required, and in what form;
- Whether the spill poses a hazard to persons or property (i.e. fire, drinking water);
- Comments and recommendations;
- The name, position and employer of the person reporting the spill; and,
- The name, position and department of the person to whom the spill is reported.

In the event of a spill involving the marine carrier delivering waste, QE will ensure the subcontractor reports any spill event under its responsibility.

APPENDIX A

Spill Response Flowchart


Spill Response
Person Discovering Spill
Supervisor
Facility manager – Olivier Simard
(867) 222-8194
- 24 Hour Spill Report Line
(867) 920-8130
Identify and Evaluate
- Product and Quantity
- Personal Protective Equipment
- Potential Impacts
- Cleanup Equipment
Limit Access and Delimit Impact Area
- Locate Safety Perimeter
- Locate Entrance and Exit
- Locate Decontamination Area
Stop Leakage/Flow and Source
Stabilize and Contain Spilled Substances
Recover Spilled Substances
- Solids – Open top 205 L Drum
- Liquids – 205 L Drum
Label and Store Recovered Substance
Dispose of Recovered Material to Approved Facility
Assess Environmental Media Affected, if any
Prepare written report for submission to the GN and the Spill Report Line supervisor
Legend
Task
Report

APPENDIX B

Standard Nunavut Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC

SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN

FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

APPENDIX B

Project Licencing History

Table 1
Project Licencing History

Licence Number	Date Issued	Comments
1BR-THI1419	20-Aug-14	Authorization to commercially treat hydrocarbon impacted water
1BR-THI1722	4-May-17	Authorization to commercially treat contaminated soil, contaminated water, and manage hazardous waste
1BR-THI1722 Amendment No. 1	15-Sep-17	Modification of discharge limits for the WTF'S treated effluent
1BR-THI2027	6-Jan-20	Modification of the deposit of waste

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