

# City of Iqaluit West 40 Landfill Operations and Maintenance Manual 2024

Project number: 60704900

January 8, 2024

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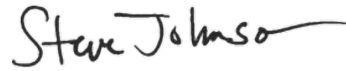
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0	December 5, 2018	Jim Clare	Draft
1	December 18, 2018	Jim Clare	Final
2	March 4, 2019	Jim Clare	NWB comments
3	January 8, 2024	Jim Clare	General Revisions

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# 1. Introduction

## 1.1 Purpose

The purpose of the City of Iqaluit Landfill (the Landfill) Operations and Maintenance Manual (the Manual) is to provide the landfill management and operating staff with a guidance document to carry out operations in a practical and reasonable manner and for maintaining regulatory compliance. The Manual provides a basis for:

- Involving operating staff in decision making for daily activities
- Policy and procedure reference document for operating staff
- Employee training
- Orientation of new employees

Given that there are no standards or guidelines for operations and maintenance of landfills in Nunavut, the Guidelines from Northwest Territories are used as reference of this manual. Therefore, this Manual is consistent with the requirements set out in the *Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories*, April 2003. This document will serve as the Guidelines for the purpose of the Manual.

## 1.2 Reference

Reference information that should be reviewed by operating staff includes the following:

- Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories, April 2003. (Available online at [http://www.maca.gov.nt.ca/?page\\_id=1765](http://www.maca.gov.nt.ca/?page_id=1765))
- Guideline for the General Management of Hazardous Waste in Nunavut (2010). (see Appendix C)
- End-of-Life Vehicle Hazardous Materials Recovery Program Manual Operation (2011) (see Appendix D)

## 1.3 Content

This Manual provides an overview of the Landfill design, operating plan and specific site features. In addition, this manual provides recommended procedures and “appropriate or best practices” for site operations and management. Updates to this manual are to be recorded in Table 1.

## 1.4 Due Diligence

Due diligence can be defined as: *“the taking of all reasonable steps as part of the due care and attention to prevent the occurrence of an accident or mishap, as well as having a contingency plan to control an incident and limit any consequential damage”*.

Due diligence includes policy development, planning and goal setting, implementation of “best management” practices, checking and corrective action, and management review. Best management principles include:

- Good housekeeping
- Preventative maintenance
- Inspections and record keeping
- Security
- Employee hiring and training
- Incident reporting

- Operations procedures
- Emergency response planning
- Risk identification and assessment
- Review and corrective action

**Table 1: List of Manual Revisions**

Section	Date of Revision	Replaces (Date)	Purpose of Revision
All	November 2018	January 2014	Up date
11.	March 4, 2019	December 18, 2018	Water Board comments
15.7.1.1	March 4, 2019	December 18, 2018	Water Board comments
Appendix J	March 4, 2019	December 18, 2018	Provided 2016 version
Appendix L	March 4, 2019	December 18, 2018	Up dated Figure. Includes Storm Water Ponds.
10.1	January 1, 2024	December 18, 2018	Up-dated Litter Control
11	January 1, 2024	December 18, 2018	Up-dated Surface Water Management
Appendix E,F and M	January 1, 2024	December 18, 2018	Deleted
All Appendices	January 1, 2024	December 18, 2018	Labels updated
Appendix J	January 1, 2024	December 18, 2018	Updated Stormwater Management Figure
All Appendices	January 1, 2024	December 18, 2018	General revisions

## 1.5 Site Description

### 1.5.1 Location

Iqaluit is a rapidly growing Baffin Island community and is the Capital of Nunavut Territory. It is located at the south end of Baffin Island, on Frobisher Bay at 64 ° 31' N latitude and 68 ° 31' W longitude. Access is provided by commercial aircraft year-round, and sea-lift from the port of Montreal in the summer. Annual precipitation in the Iqaluit area is approximately 255 cm of snowfall and 19.2 cm of rainfall. Average annual temperatures range from a low in January of approximately -29.7 degrees Celsius (°C) to a high of approximately 11.4 °C in July.

Iqaluit has developed into the eastern Arctic's largest community. In order to minimize the impact of the community on this environment, it is imperative that the solid wastes produced by the community are carefully managed.

The location of the solid waste disposal facility relative to the community is shown in Figure 1.1.

The solid waste disposal site is located in West 40. This site was built in 1995 and was intended as an interim landfill site until the location of a long term operating site could be identified and implemented. In 2001 and 2006, the Landfill was expanded to extend its lifespan and a water surface water management system was installed. Waste disposal techniques at that landfill include compaction and covering with soil materials wood waste when available.

## 2. Organizational Structure

In the City of Iqaluit, the Department of Public Works and Engineering is responsible for municipal solid waste (MSW) management, which includes collection of residential and commercial waste, and the management of the Landfill.

### 2.1 Duties and Responsibilities

#### 2.1.1 Director of Public Works

The Director of Public Works is responsible for solid waste management of the City. Duties of the Director for landfill management include:

1. Administration
  - Preparation of operating budgets
  - Maintenance of operating records and administrative reports
  - Environmental monitoring and Reporting
  - Meeting and administrative reports
  - Monthly and annual reports, as required by the Nunavut Water Board License and Chief Administrative Officer (CAO)
  - Staffing
  - Authorize policies pertaining to landfill operations
  - Report to Council, as required by the CAO
2. Planning and Development:
  - Work with Engineering Department to oversee capital development projects
  - Review the overall operations to monitor that development is according to current engineering plans
  - Review and implement plans for reclamation of completed portions of the site
3. Regulatory Compliance:
  - Sampling required under the City's Water License
  - Review and submit required monitoring reports
  - Review landfill audits
  - Work with Engineering Department to review and submit other landfill related documentation to Nunavut Water Board (NWB)
4. Public Communication:
  - Respond to public and media inquiries
  - Address any complaints
5. Policies
  - Responsible to review and update all Landfill policies
6. Safety
  - Make safety training available to staff

## 2.1.2 Sanitation Superintendent

The Sanitation Superintendent is responsible for the management of the Landfill and reports to the Director of Public Works. Duties of the Superintendent include the following:

1. Planning and Development of the Landfill:
  - Coordinate the overall operations to ensure development is according to the current engineering plans
  - Plan for reclamation of completed portions of the site
  - Schedule and coordinate shipment of hazardous materials to accredited southern waste management facilities
  - Schedule and coordinate shipment of non-hazardous materials to southern recycling facilities as required
2. Regulatory Compliance:
  - Oversee the completion of the monitoring program and the preparation of required monitoring reports
  - Prepare and submit to the Director other related documentation required by the NWB
3. Safety
  - Ensure staff receive applicable safety training
  - Ensure staff are familiar with the site safety plan

## 2.1.3 Landfill Foreman

The Landfill Foreman reports to the Sanitation Superintendent and is responsible for overseeing vehicular traffic and day-to-day operations of the Landfill. At the site entrance, the Landfill Foreman provides the first level of contact with the landfill customer and must provide all initial waste screening requirements. Duties of the Landfill Foreman include:

1. Gate Operations:
  - Control vehicles entering and exiting the landfill and record the amount of waste received for disposal and recycling
  - Identify wastes entering the Landfill and screen for prohibited wastes
  - Direct site users to appropriate disposal or storage location
  - Communicate with other Landfill Operators to assist in their waste screening responsibilities
  - Report to Superintendent in cases of rejecting waste
  - Collect tipping fees as per the City's Solid Waste Bylaw
2. Vehicle Spotting and Waste Inspection:
  - Direct site users to appropriate disposal or storage areas
  - Direct vehicles to safe area for unloading
  - Visually inspect wastes and spot prohibited wastes
3. Site Maintenance:
  - Carry out winter and summer maintenance of roads and drainage ditches
  - Collect spilled and wind-blown debris and litter
4. Equipment Operations:
  - Pile wood
  - Spread and compact wastes on the working face
  - Maintain the tipping pad free of debris and hidden obstacles

- Maintain equipment
5. Planning and Development of the Landfill:
    - Plan daily working face operations to comply with the overall Landfill fill plan
    - Work with Superintendent to plan disposal area construction
    - Work with Superintendent to conduct landfill audits/inspections
    - Coordinate the overall operations to ensure development is according to the current engineering plan
    - Manage storage compounds
  6. Regulatory Compliance:
    - Maintain landfill operations within regulatory requirements
    - Complete landfill audits as required
    - Take corrective action for minor issues of non-compliance and notify the Superintendent
    - Recommend corrective action to the Superintendent for major items of non-compliance
  7. Monitoring of surface water and waste disposal including:
    - Maintain drainage system and manage surface water as required under Water Licence No.3AM-IQA1626
    - Oversee the overall operations of surface water management to ensure no water is ponding on site and run-off outside the Landfill area; development is according to the current engineering plans
    - Perform and document regular visual inspections of the Landfill perimeter berms
    - Complete monitoring required under the Water License No.3AM-IQA1626
  8. Planning and Development of the Landfill:
    - Plan daily working face operations
    - Work with Superintendent and Landfill Operator to plan disposal area expansion and soil cover supply
    - Work with Superintendent and Landfill Operator to conduct landfill audits/inspections
  9. Administrative Duties:
    - Schedule delivery of fuel, oil, and supplies
    - Maintain daily operating records
  10. Safety:
    - Administer the Site Safety Plan
    - Conduct Safety Orientation for Visitors and Contractors

#### 2.1.4 Landfill Operator

The Landfill Operator (Operator) is responsible for performing duties as assigned by the Landfill Foreman. These positions would typically address both ongoing and periodic general site operation and maintenance requirements. Duties of the Operator include:

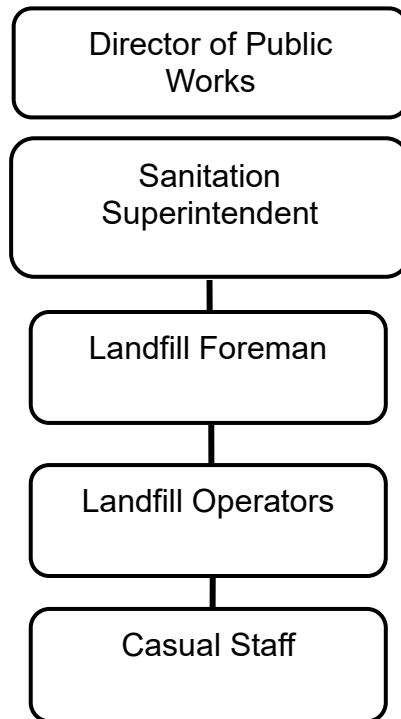
1. Vehicle Spotting and Waste Inspection:
  - Direct site users to appropriate disposal or storage areas
  - Direct vehicles to safe area for unloading
  - Visually inspect wastes and spot prohibited wastes
2. Site Maintenance:
  - Carry out winter and summer maintenance of roads and drainage ditches
  - Collect spilled and wind-blown debris and litter

3. Equipment Operations:
  - Pile wood
  - Place and compact cover soil
  - Maintain the tipping pad free of debris and hidden obstacles
  - Maintain equipment
4. Safety
  - Familiarise and adhere to the facility safety plan

## 2.2 Organization Structure

The organization structure for the City of Iqaluit Landfill is illustrated in Figure 2.1.

**Figure 2-1: Organization Chart - City of Iqaluit Landfill**



## 2.3 Contact List

The individuals responsible for the operation of the solid waste facility in Iqaluit are listed in the following table:

**Table 2: Contact List**

Title	Phone Number
Landfill Foreman	(867) –975-2412 (Landfill office) C: 867-222-2972
Sanitation Superintendent	(867) 979-5699
Director of Public Works	(867) 979-5635

## 2.4 Personnel Training

Every landfill employee must be trained to perform his or her job in a safe and environmentally responsible manner, in accordance with applicable regulations. Employees will be kept current with changes in regulations and technology through ongoing applicable training courses as regulations and the technical aspects of landfill operation require. Specific training topics may include hazardous waste management, surface water control, spill prevention, first aid and safety.

Continued on-the-job training will be provided to all employees. The training will emphasize the safe and environmentally sound operation of the Landfill. A review of this Operations and Maintenance Manual will be a prerequisite for any employee before being declared eligible for work at the Landfill. All employees will be provided with safety training covering all equipment and systems, with which they will be expected to operate on a daily basis. The use of personal protective equipment (PPE), and the handling and precautions associated with hazardous wastes, will also be included in the safety training.

A training program for more specific tasks, such as those of mobile equipment operators will be documented with written records of meetings and types of instruction. This instruction will include identification of hazardous wastes and unacceptable wastes; emergency procedures in case of fire, spill or injury; confined space entry; respirator use; and other issues that may periodically arise. As required, individuals must be trained in Confined Space Entry, Transportation of Dangerous Goods (TDG) and/or Hazardous Waste Management, Workplace Hazardous Material Information System (WHMIS), and practice proper safety procedures in accordance with applicable legislation and the requirements of the Workers Safety and Compensation Commission (WSCC). Documentation will also be kept on file at the Site Owners office and reviewed annually for any necessary updates.

## 3. Governance

### 3.1 City of Iqaluit Solid Waste Bylaw

The Landfill operator and staff must adhere to the City's Waste Management By-law identified in Appendix E.

### 3.2 City of Iqaluit Water License

The City of Iqaluit Landfill must operate within the terms and conditions set out in the Licence No. 3AM-IQA1626/Type "A" issued by the NWB to the City of Iqaluit. This Licence is effective June 17, 2016 and expires June 16, 2026. Under this licence, the City is entitled "to use water and disposes of waste associated for municipal undertakings". Appendix F includes a copy of Water License No. 3AM-IQA1626.

### 3.3 Acts, Regulations and Guidelines

#### 3.3.1 Acts and Regulations

In addition to the Water Licence, the Landfill must be operated within the *Nunavut Environmental Protection Act (1998)* (EPA) and its associated Regulations, *Environmental Right Act (1988)*. The EPA was amended in 1998 and came into force in April 1, 1999. It creates a framework for an integrated approach to protect the environment including air, land, water, and all organic and inorganic matter and living organisms.

The operations of the Landfill must also comply with *Nunavut Safety Act and Regulations* to protect Landfill operators, visitors, customers, or anyone at the Landfill site.

#### 3.3.2 Guidelines

Relevant Government of Nunavut guidelines that may be used as additional reference information in the operation and maintenance of the City of Iqaluit Municipal Landfill are listed below. These documents can be viewed on the Nunavut Department of Environment (DOE) website

<https://www.gov.nu.ca/environment/information/documents/195%2C184>

- Waste Lead and Lead Paint (2014)
- Used Oil and Waste Fuel
- Biomedical and Pharmaceutical Waste
- Waste Batteries (2011)
- Waste Solvent (2011)
- Waste Paint (2010)
- Waste Asbestos (2011)
- Waste Antifreeze (2011)
- Ozone Depleting Substances (2011)
- General Management of Hazardous Wastes (2010)
- Dust Suppression
- Mercury-Containing Products & Waste Mercury (2010)
- Guideline for Burning and Incineration of Solid Waste (2012):
- Environmental Guideline for Used Oil and Waste Fuel
- Environmental Guideline for Used Oil and Waste Fuel

The document *End-of-Life Vehicle Hazardous Materials Recovery Program Manual* (2011) prepared for the DOE may be used as a reference for End of Life Vehicles operational procedures. It is available on the DOE's website at [https://www.gov.nu.ca/sites/default/files/final\\_-\\_elv\\_program\\_manual\\_-\\_jan\\_10\\_2011\\_0.pdf](https://www.gov.nu.ca/sites/default/files/final_-_elv_program_manual_-_jan_10_2011_0.pdf).

The guideline for managing landfills in the NWT can also be used as a reference for managing waste disposal facilities in Nunavut. This guideline is "*Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories (2003)*". This guideline promotes effectiveness and efficiency of municipal solid waste landfills. It is available for download on the NWT MACA Solid Waste Management webpage: [https://www.enr.gov.nt.ca/sites/enr/files/guidelines/solidwaste\\_guidelines.pdf](https://www.enr.gov.nt.ca/sites/enr/files/guidelines/solidwaste_guidelines.pdf)

## 4. Site Facilities

All solid waste management facilities associated with the Landfill are located within the limits of the site development, with the exception of the Retention Pond 1 and Retention Pond 2. These facilities include:

- A site office located near the entrance to the Landfill site
- Garage
- Scrap metal area
- Scrap tire collection area
- Household Hazardous waste depot
- On Site Leachate Holding Pond
- Retention Pond 1
- Retention Pond 2
- White metal collection
- E-waste collection
- End-of Life vehicle decontamination area

### 4.1 Recycling Storage Facilities

The site includes storage areas for recycling of bulky materials including:

- Scrap metals
- Car bodies
- Appliances/refrigerators and freezers
- Scrap tires
- E-waste

Public sorting of waste or scavenging is not permitted within the disposal area of the Landfill.

### 4.2 Household Hazardous Waste Area

This site includes storage areas for household hazardous waste (HHW) including:

- Paints and Solvents
- Batteries
- Cleaning Products
- Automotive Products (antifreeze, motor oil, car batteries, brake fluid, transmission fluid)
- Small propane tanks and cylinders

### 4.3 Landfill Disposal Operating Area

The existing municipal waste operating area is operated using the area method and functions as a natural attenuation system without a liner. The site is underlain by bedrock, silty sand and permafrost.

## 4.4 Equipment

The list of landfill equipment includes:

- Cat D7 Dozer
- Cat 950G Loader
- John Deer 318E Skid Steer
- Ford F250 With tidy tank for refueling
- 2 - Ford F250 Pick-ups
- Ford F350 Pick-up

## 4.5 Surface Water Management

Surface water is managed within the Landfill by a series of perimeter berms that collect and contain on-site runoff within the Landfill. On-site runoff is pumped to an off-site retention pond for storage. It is then stored prior to discharge to Koojesse Inlet. See Section 11 for details on Surface Water Management

## 5. Site Security and Control

### 5.1 Supervision

At least one employee will remain at the site during all hours that the facility gates are open for public access.

Upon arrival, all vehicles entering the Landfill site shall report to the Landfill Operator. Following load check and documenting the waste load, Landfill customers will be directed to the appropriate disposal or storage area for disposal of the waste.

### 5.2 Hours of Operations

The City of Iqaluit establishes the operating hours of the Landfill and posts these hours, at the entrance. The Hours of Operations Policy is subject to change and is included within the Policy Section of this manual.

In the event of an emergency or as deemed necessary, the Landfill Operator may provide access to the site at alternate times with prior arrangement and approval.

### 5.3 Gate Controls

Traffic enters and exits the Landfill via the existing access road approximately 4 kilometres (km) from the city center. The Landfill is surrounded by a chain link fence and has controlled access through one gate at the Landfill entrance. Access to the Landfill is gained through the main entrance gate located at the west side of the site. The gates will be closed and locked outside of the normal operating hours.

Public sorting of waste or scavenging is not permitted within the disposal area of the Landfill.

**Gate Control** - Landfill Foreman is responsible for ensuring the gates are locked and secure after hours. The Foreman will ensure that no persons remain in the Landfill before the gates are locked.

**Key Control** - Access keys are assigned to the Superintendent and Landfill Operator, and potentially to other authorized personnel, to limit circulation of keys.

Emergency access keys are kept at the office of the Department of Public Works and are under the control of the Superintendent and Director of Public Works.

### 5.4 End-of-the-Day Closure

At the scheduled closing time, the Landfill Operator will secure the site by closing and locking the main entrance gate. "End-of-the-day closure" includes:

- Checking for customers and visitors that may be remaining on the site
- The Landfill Operator will remain at the gate to allow exit of any customers or visitors remaining at the site
- Closing and locking the entrance gate once all customers and visitors have left the site
- Conducting backup for collected data
- Checking site building to ensure there is no one present and that all doors are locked
- Conducting a final check of the working face to ensure the area is secure and there is no evidence of fires
- Closing and locking the access road gate

## 6. Customer Service

### 6.1 Guiding Principles for Customer Service

Customers of the Landfill will form opinions on what they see and how they are treated. A positive experience builds trust and confidence in the site operations and will assist in gaining co-operation on future visits.

To meet this objective, the following are guiding principles to assist the Landfill employees:

- Be positive and enthusiastic
- Keep the site, facilities, and equipment in a clean and orderly fashion
- Be involved in decision making and support the decisions of co-workers
- Be open-minded to compromises and ideas
- Be flexible with customers with reasonable discretion
- Show respect for the customer
- Assist the customer within reasonable limits
- Communicate and educate the customer
- Provide effective and efficient service
- Create “win/win” solutions that satisfy the customer, with consideration for public safety, financial considerations, and Landfill operations
- Treat the customer as we would want to be treated at their place of business

### 6.2 Assisting Customers with Vehicle Problems

In the event that a customer experiences problems with their vehicle, the Landfill Operator should provide assistance so that the vehicle and driver are:

- In a safe situation
- Out of the way of other customers
- Looked after so that appropriate help is provided

Assistance for vehicle problems may include:

- Assisting the vehicle driver to phone a tow truck
- Either assisting or arranging for someone to assist the driver to change a flat tire

Vehicle drivers must be informed of any risks or liabilities that may be involved in providing assistance, such as towing vehicles. Any actions taken are to be at the discretion of the Landfill Operator, with customer satisfaction and safe operation of the Landfill in mind.

## 6.3 Public Inquiries

The public, regulating agencies, or the media may ask questions to the Director, either directly or by phone. The Director should politely request any individual making an inquiry to identify themselves in order that the questions may be appropriately responded to.

The following are general guidelines for responding to inquiries:

1. If questions are of a general nature (i.e. hours of operations), the employee should provide these answers along with any relevant printed information that may help
2. Inquiries should be referred to the Superintendent if the questions are related to the following:
  - a. Technical issues
  - b. Regulatory issues
  - c. Financial issues
3. Inquiries received from regulatory agencies or the media should be referred to the Director
4. If a question is asked and the employee does not know the answer, the employee should say so and refer the person to the Superintendent
5. If an employee is unable to take the time to answer a question because of a heavy work load during peak periods, the employee should:
  - a. Explain the situation
  - b. Ask the person to leave their name and phone number so that someone may call back at a less busy time

## 7. Waste Acceptance Procedures

### 7.1 Accepted and Non-Accepted Wastes

#### 7.1.1 Accepted Waste

Any waste disposal operation has limitations with respect to the waste streams which may be handled in an environmentally safe manner. Limits must be placed on the types of waste accepted at a disposal site in order to protect the environment, the employees, the users and neighbours, as well as the equipment from damage, while simultaneously providing adequate levels of service.

The Site Owner shall allow only those materials to be deposited at the Iqaluit Landfill for which the facility has been designed for with the exception of unique circumstances reviewed in consultation with regulatory agencies.

Acceptable wastes are listed below:

- Plastic, metal, and paper wastes; packaging; cardboard; newsprint; food; rubber; leather; glass; wood; from residential, commercial or industrial premises
- Animal and vegetable (organic) waste material
- Sweepings, clothing and textiles, consumer electronics, and discarded household utensils
- Furniture and major appliances
- Non-salvageable metals
- Tires
- Construction & Demolition wastes (provided the waste is not a hazardous or banned material)

*Household Hazardous Waste Streams such as:*

- Cleaning Products (oven cleaners, drain cleaners, bleach, spot remover)
- Paints and Solvents (oil-based paints, thinners, paint stripper)
- Automotive Products (antifreeze, motor oil car batteries, brake fluid, transmission fluid)
- Pesticides and herbicides
- Small propane tanks & cylinders (Barbeque tanks)
- Miscellaneous Hazardous Materials (household batteries, photographic chemicals, pharmaceuticals, aerosol sprays)
- Biomedical wastes/ash that have been incinerated, and cooled prior to disposal

#### 7.1.2 Non-Accepted Waste

Wastes which present a danger at the Landfill Site, require special disposal techniques, or may interfere with the level of service to the public, are not acceptable for disposal. In some cases, wastes which are acceptable in small quantities may not be acceptable in large quantities from a single generator because they may cause the level of service to other users to deteriorate and cause handling problems at the site and increased environmental liability. To some extent, the acceptability of large quantity wastes must be at the Site Owners discretion, depending on the ability to accommodate disposal without deterioration in the level of service. In cases where unacceptable wastes are identified, site staff will attempt to identify allowable management alternatives to material haulers.

All wastes which pose potential safety or environmental problems cannot be listed in their entirety. The Site Owner and site personnel in general must be wary of accepting wastes which could cause future operational problems and must watch for the inclusion of unacceptable wastes in regular loads of refuse.

A list of materials which MAY NOT be accepted for placement in the Landfill is as follows:

- Contaminated soils not meeting landfill disposal criteria
- Paint and batteries from commercial and industrial operations/businesses
- Explosives or highly combustible materials of any nature
- Large volumes of waste oil and fuel (more than 5 Litres per load)
- Gas cylinders, unless the valve has been removed and the cylinder properly drained by a professional trained in handling gas cylinders
- Radioactive materials
- Mercury
- Industrial/Commercial Hazardous Waste
- Drums with unidentified contents
- Large volumes of fuel tank sludges from tank farms
- Hot ashes
- Any liquids, or liquid waste, of a quantity greater than five Litres in any one load
- Biomedical wastes that are not incinerated or autoclaved prior to disposal
- Waste pharmaceuticals
- Polychlorinated Biphenyls (PCBs) or PCB contaminated materials
- Any other materials not listed as acceptable or conditionally acceptable with the approval of the Site Owner

## 7.2 Segregation of Materials

Materials accepted at the Landfill for recycling that require segregation from general waste include:

- Appliances containing CFCs
- Automobile batteries
- End of Life Vehicles
- Paint
- E-waste
- Propane tanks
- Scrap tires

## 7.3 Waste Acceptance Screening Procedure

Among the most important duties of the Landfill Operator are to ensure that wastes are properly and thoroughly screened, and if any unacceptable wastes are found, that they are safely managed. The community must be aware of the screening activities and their results.

### Screening the Waste

Vehicles delivering waste to the Landfill are required to report to the Landfill Operator. The first point of on-site contact is at the gate, which allows for an initial screening process. It is not possible to screen the contents of packer trucks and transfer vans at the gate. Screening of these vehicles' contents must be done at the working face.

The second point of on-site contact is at the disposal area where vehicles are unloaded. The Landfill Operator will visually inspect loads. The Landfill Operator should look for any waste that does not fall within any of the acceptable waste types as listed in Section 7.

Hazardous or other waste that has received prior approval for shipment to the Landfill should be inspected to verify that it fits the description provided by the generator. The waste load should be inspected and clearly classified prior to being pushed or compacted.

### **Know Your Generators and Haulers**

It is important to know the potential sources of prohibited wastes from the service area. Some examples are:

- The automotive repair industry generates solvents, paint wastes, lead acid batteries, grease and oil
- Medical and dental clinics generate bio-medical wastes
- Individuals may bring in batteries, paint, oils, spent fuel, etc.

### **Be cautious in accepting wastes from unknown, unlicensed, or otherwise questionable haulers.**

The Landfill Operator will also identify suspicious wastes based upon visual and odor characteristics. Indicators of suspicious wastes may include:

- Hazardous signage or markings
- Liquids
- Powder or dusts
- Sludge
- Bright or unusual colours
- Drums or commercial size containers
- Chemical odours
- Smoke

General information obtained from the waste hauler shall include:

- Time and date of visit to the Landfill
- Vehicle identification/license number
- Source and nature of the waste disposed of

### **Inspection Safety Considerations**

The Waste Inspector will wear the following safety clothing during inspection:

- Coveralls
- Safety boots
- Gloves
- Safety vest
- Face mask as required
- Eye protection

Where a load is rejected and turned away from the Landfill, the Landfill Operator will attempt to secure the following information:

- Vehicle type and license number
- Identifying company names or addresses
- The source of the waste
- Name and description of the vehicle driver
- Details of the load inspection and reasons for rejection

### **Emergency Handling**

Should an emergency situation occur such as a spill, procedures outlined in Appendix G – Landfill Emergency Response Plan will be implemented. A copy of the Emergency Response Plan will be kept on site.

Procedures (beyond spill response) in such events involve:

1. Place notification call to the Environment Protection Division of the Department of Environment, NU as outlined in Section 13.12 and 15.6
2. Confirm and record the name and phone number of the contact person
3. Obtain and record the name and address of the company responsible for the emergency disposal or storage
4. Determine the nature of the material, handling procedures and necessary precautions to be taken.
5. Contact the Superintendent
6. Arrange for the Landfill Operator to remain after hours, if required
7. If material requires covering or handling with landfill equipment, contact the Landfill Operator.
8. If the responsible company does not have an account, information and collection of fees for the service will be done by the Public Works Department of the City of Iqaluit

## 8. Waste Handling

### 8.1 Overview

The nature of wastes accepted at a landfill requires that different types of materials be handled in different ways. Although there are special cases where the Landfill Operator must make a “best judgment” on how to handle a particular material, there are accepted procedures for most products in the waste stream. If the type of waste is unknown, then the operator should not accept the waste material until it can be verified.

### 8.2 Recyclable Materials

Procedures for managing recyclable materials delivered to the Landfill are outlined below.

#### **Bulky Metals**

Metals are stored in the designated storage area. Alternative storage areas may be designated by the Landfill Operator for temporary storage and should be located where there is available room to unload vehicles and load recycling transport vehicles.

Metal piles should be sorted and organized to improve marketing potential. Metals may be sorted as cast iron, panned metals, tin, wire/cable, car bodies, and appliances.

Appliances that may contain CFCs (refrigerators, freezers, and air conditioning units) are to be set aside so that the CFC contents can be purged by a qualified individual as outlined in the Guideline for Ozone Depleting Substances.

#### **Tires**

Tires will be loaded and stored on-site in a designated shipping container in the recycling area. Tires hauled by individuals will be accepted for storage in the recycling area. Once a shipping container is full it will be sealed and prepared for shipping to a tire recycler. The Superintendent will contact tire haulers/processors in the NU, if available, or in another provinces to arrange for recycling

#### **E-Waste**

All e-waste (i.e. T.V's, radios, cell phones, radios, computers and accessories, etc.) will be accepted and loaded and stored on-site in a designated shipping container in the recycling area. Once a shipping container is full it will be sealed and prepared for shipping to an e-waste recycler. The Superintendent will arrange with local haulers/processors to arrange for recycling.

#### **Paint**

All waste paint will be loaded and stored in a designated shipping container in the recycling area. Once the container is full the container shall be sealed and arrangements made with the local processor to arrange for proper disposal and recycling. Any paint cans that are empty, and the paint is film dry, can be disposed of in the Landfill.

## **Automotive Batteries**

All automotive batteries received from residential customers are to be accepted, loaded, stored and labeled in acceptable shipping containers. The batteries must be stored off the ground in weather proof containers or storage building. Superintendent shall make arrangements to have all stored batteries shipped to an approved recycler on an annual basis. Refer to Automotive Battery Policy and Environmental Guidelines for Waste Batteries, Department of Environment, Government of Nunavut, Revised January 2011

## **Lithium Batteries**

All lithium batteries are to be accepted, loaded, stored, and labeled in acceptable shipping containers. The batteries must be stored off the ground in waterproof containers. Batteries must be inspected for damage with any damaged batteries separated from other batteries. Lithium batteries must not be stored with other batteries and TDG labeled separately from other batteries. Refer to Environmental Guidelines for Waste Batteries, Department of Environment, Government of Nunavut, Revised January 2011. See Appendix K

## **Propane Tanks**

Only propane tanks that are empty and valves open shall be accepted. Any accepted propane tanks shall then have the valves removed. Once the valves have been removed the tanks can then be stored in the scrap metal storage compound. Refer to Propane Bottle Policy for proper management.

## **8.3 Hazardous Waste**

Hazardous waste materials which are household in origin are to be treated or stored in the hazardous waste disposal area. Hazardous wastes from commercial/industrial sectors will not be accepted at the Landfill. In accordance with the Nunavut Waste Guidelines, all hazardous waste generated by commercial and industrial activities are to be demobilized south by the waste generator.

The hazardous waste storage area has sea lift containers for storage of wastes. This area is surrounded by fence and has a separate gated entrance from the main road.

Due to the danger of handling hazardous wastes, the handling, packaging, storage, treatment of the wastes should only be completed by personnel trained in Transportation of Dangerous Goods (TDG) and/or Hazardous Waste Management and WHMIS.

### **8.3.1.1 Hazardous Waste Definition**

Hazardous wastes as those wastes which, due to their nature and quantity, are potentially hazardous to human health and/or the environment and which require special handling and disposal techniques to eliminate the hazard. A hazardous waste includes products, substances or organisms which, by their nature, satisfy the requirements of being a dangerous good as defined in the Federal Transportation of Dangerous Goods Act.

The Transportation of Dangerous Goods Act recognizes nine classes of dangerous goods which are considered hazardous.

Those products, substances, or organisms that would be considered hazardous generally include the following Classes of waste as defined in the Transportation of Dangerous Goods Act.

- Class 1 - Explosives
- Class 2 - Compressed gases
- Class 3 - Flammable and combustible liquids
- Class 4 - Flammable solids

- Class 5 - Oxidizing substances
- Class 6 - Poisonous, toxic and infectious substances
- Class 7 - Nuclear substances
- Class 8 - Corrosives
- Class 9 - Miscellaneous products, substances or organisms that may pose a risk to life, health, property or the environment

Typical household hazardous waste which can be expected to be stored at the Landfill includes:

- Cleaning Products (oven cleaners, drain cleaners, bleach, spot remover)
- Paints and Solvents (oil-based paints, thinners, paint stripper)
- Automotive Products (antifreeze, motor oil, car batteries, brake fluid, transmission fluid)
- Pesticides and herbicides
- Small propane tanks and cylinders (Barbeque tanks)
- Miscellaneous Hazardous Materials (household batteries, photographic chemicals, pharmaceuticals, aerosol sprays)

### 8.3.1.2 Household Hazardous Waste Collection

Household hazardous waste can be dropped off at the Landfill during operating hours, this allows the Landfill Foreman to ensure that the hazardous waste entering the Landfill is residential and not commercial.

Any known hazardous wastes spotted in the general refuse area of the Landfill will be relocated to the hazardous waste area by trained personnel.

### 8.3.1.3 Household Hazardous Waste Storage

The accumulated household hazardous wastes shall be placed in the on-site storage containers by trained personnel. Once the wastes have accumulated a significant volume, they will be prepared and shipped to a southern disposal facility.

The site operator should be trained in WHMIS and Transportation of Dangerous Goods (TDG) and/or Hazardous Waste Management. The current Material Safety Data Sheets (MSDS) must be kept on site for all products stored at the site. Supplier or workplace labels must be placed on all containers which hold a hazardous waste.

Factors to be considered when storing hazardous waste include compatibility, segregation, ventilation, climate/environment, handling, security, labeling, record keeping, and emergency response. The following summarizes some of the factors that will be considered when dealing with hazardous wastes.

#### **Compatibility**

The compatibility between different types of hazardous wastes stored in the same storage container must be considered before storage. The compatibility of wastes with materials and equipment which is stored nearby is also very important, particularly when dealing with flammable wastes. The compatibility of wastes with their storage containers must also be considered. The site operator will review the WHMIS for this information.

#### **Segregation**

The final destination of hazardous wastes will be considered before storage. If future recovery may be possible, storage of the material will allow for such recovery.

## **Ventilation**

Hazardous wastes may present a serious health hazard in storage and will therefore be well ventilated. Volatile materials in particular will be considered. Since sealift containers do not accommodate proper ventilation, the site operator will ventilate the storage container before entering.

Ventilation will consist of opening the access doors one hour prior to entering. An observer will be present upon entering to ensure that the operator is not overcome by fumes. The observer must have access to communication in the event of an emergency.

## **Climate/Environment**

Contact between hazardous wastes and rainwater and soil will be prevented, and wastes should not be exposed to direct sunlight. For outside storage of hazardous wastes, containers will be covered by a tarpaulin and placed on an impermeable base. This will also facilitate and reduce the cost of clean-up for any spills or leaks. The containment area will be curbed and diked to collect spills, leaks and precipitation.

## **Handling**

Handling of hazardous wastes will be in accordance with WHMIS guidelines. The site operator will obtain WHMIS information for materials accepted at the site. The Transportation of Dangerous Goods Regulations will be followed when transporting the wastes off site.

## **Security**

Security precautions will be taken to avoid theft, accidental discharge, and any possible harm to the public. The gate to the hazardous waste storage area will be locked at all times except when the operator is working in the hazardous waste area. Sealift containers will be closed and locked when access is not required.

## **Record Keeping**

A record of the types and quantities of hazardous wastes must be maintained in a log book to ensure safe storage. Containers must be properly labeled during the entire time in storage. If this is not carefully completed then there could be problems identifying the waste when it is time to ship it south for disposal.

Record keeping will also include ongoing quantity totals and dates received. Since relatively small quantities of materials are expected to be delivered to the site, individual lists for each material will be worthwhile.

As a minimum record keeping should include the following:

- Type of waste received
- Quantity received
- Dates received
- Name of person/company who disposed the waste if available
- Method of storage/disposal
- On-going total quantity for each type of waste

## **Emergency Response Plan**

An emergency response plan has been developed in case of a significant spill, fire, or other emergency (See Appendix G). The depot will also be equipped with an emergency spill kit and fire suppression equipment.

#### 8.3.1.4 Transport and Disposal

Household Hazardous waste collected and stored by the City will be shipped to a receiver or hazardous waste management facility located outside of Nunavut. As per the Department of Environment, Government of Nunavut *Environmental Guideline for the General Management of Hazardous Waste*:

- Household Hazardous waste will only be shipped to a receiver or facility that has been registered in the receiving province or territory to accept that waste
- Waste manifests will accompany each shipment of waste in accordance with the Transport Authorities' requirements and in compliance with the Interprovincial Movement of Hazardous Waste Regulations
- The Landfill Foreman will work with the carrier to ensure that any hazardous waste shipped is packaged, documented, labeled and placarded in compliance with the method of transport used
- The Landfill Foreman will receive all documentation stating that the Hazardous Waste has been received by a registered facility (manifest)

### 8.4 Sewage Sludge

Dewatered sewage sludge from the Waste Water Treatment Plant is accepted for direct disposal into the active working face. Prior to delivery of the sludge a small "disposal pit" shall be prepared at the active working face. A load of waste from one of the commercial City waste collection trucks shall be dumped close to the area prepared for the sludge. Once the sludge is dumped it shall be immediately covered with the reserved waste load. The Waste Water Treatment Plant must call ahead and make prior arrangements with the Landfill to allow the Landfill adequate time to make necessary preparations for the acceptance of the sludge. Arrangements for sludge acceptance should not be early in the morning and ideally would occur later in the day and prior to the last waste collection truck arriving at the Landfill.

### 8.5 End of Life Vehicles

The New Hampshire Department of Environmental Services identified a number of best practices with respect to dismantling end-of-life vehicles, including:

- Prior to removing parts and dismantling vehicle components, completely drain all vehicle fluids, including antifreeze, brake fluids, engine oils, transmission fluids, windshield washer fluid, power steering fluid, rear axle housing fluids, etc. Do this over an impervious surface.
- Do not mix the fluids. Recycle, reuse, or dispose of fluids in an appropriate manner.
- Dismantle and drain vehicles, parts, scrap, and cores in one centralized location that is under a roof and over an impervious surface (for example, concrete). Make sure there are no open drains or cracks in the surface.
- Use drip pans when unclipping hoses, unscrewing filters and removing parts.
- Replace drain plugs when done draining.
- Fully drain parts and cores on a drain table or drip rack before moving them to a storage area.
- Keep spill control equipment nearby. Clean up spills immediately.
- Seal all fluid lines after draining to prevent leaks. Metal lines can be crimped or bent; rubber hoses can be plugged with clamps, balls, or golf tees.
- Remove and separate recyclable and potentially hazardous components, including the fuel tank, radiator, tires, battery, catalytic converter, air bag units, and mercury switches.
- Remove and capture air conditioning refrigerants (R-12 and R-134a). Qualified persons, using certified equipment, must perform this work.
- Remove engines through the hood. Do not tip vehicles on their sides, because this allows fluids to run out and spill on the ground.
- Establish a good routine for dismantling vehicles and stick with it.

- At “you-pull-it” facilities (where customers are allowed to remove parts), make sure the fluids are drained from vehicles before customers are allowed to remove parts. Instruct customers on proper procedures to prevent leaks during removal of parts, and provide spill control supplies for convenient customer use.
- Store engines, transmissions, and other oily, greasy parts off the ground, over an impervious surface, and under cover to prevent soil, groundwater, and storm water contamination. Have spill controls, including drip pans and absorbents handy.
- Keep an inventory of the vehicles and parts stored at the facility. <sup>1</sup>

In Canada, the Automotive Recyclers of Canada recently prepared the *National Code of Practice for Automotive Recyclers Participating in the National Vehicle Recycling Program* for Environment Canada<sup>2</sup>. The document describes the environmental considerations of related to managing end-of-life vehicles and reviews the national code of practice for reuse and resale, administration, spills, dealing with hazardous materials, automotive recycler processing areas, and equipment and infrastructure. The document is available for download at [www.certifiedautorecycler.ca/resources.html](http://www.certifiedautorecycler.ca/resources.html).

As noted previously, the document *End-of-Life Vehicle Hazardous Materials Recovery Program Manual Operation* (2011) prepared for the DOE may be used as a reference for End of Life Vehicles operational procedures. It is available on the DOE’s website at [http://env.gov.nu.ca/sites/default/files/final\\_-\\_elv\\_program\\_manual\\_-\\_jan\\_10\\_2011\\_0.pdf](http://env.gov.nu.ca/sites/default/files/final_-_elv_program_manual_-_jan_10_2011_0.pdf).

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<sup>1</sup> New Hampshire Department of Environmental Services. N.H. Green Yards BMP Guide Sheet #11. May 2003.

<sup>2</sup> Automotive Recyclers of Canada. National Code of Practice for Automotive Recyclers Participating in the National Vehicle Recycling Program. March 2010.

## 8.6 General Guide

A general guide for the handling of various waste materials is provided in Table 3.0. This guide is only intended for reference; specific circumstances may dictate handling requirements and procedures.

**Table 3: General Guide to Waste Handling**

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	Examples	Special Concerns	Handling Procedures
Asbestos	Insulation, coated pipes	<ul style="list-style-type: none"> <li>Airborne particles pose a health risk to landfill employees and customers</li> </ul>	<ul style="list-style-type: none"> <li>DO NOT ACCEPT asbestos for disposal</li> <li>Refer to site policies and Guidelines for the General Management of Hazardous Waste in NWT for acceptance and handling of asbestos</li> </ul>
Bulk Liquids (except for select sump waste)	Oils, sump liquids, industrial liquids	<ul style="list-style-type: none"> <li>Bulk liquids are prohibited from disposal</li> </ul>	<ul style="list-style-type: none"> <li>Do not accept liquid wastes for disposal</li> </ul>
Bulky Metals	Appliances, culverts, sheets, equipment parts	<ul style="list-style-type: none"> <li>Consumes landfill space</li> <li>Recyclable materials</li> <li>Difficult to incorporate into working face</li> <li>Appliances may contain CFCs</li> </ul>	<ul style="list-style-type: none"> <li>Divert to metal storage area for recycling</li> <li>Apply Ozone Depleting Substances Management Policy</li> </ul>
CFC's	Refrigerators, Freezers	<ul style="list-style-type: none"> <li>Contains CFC's</li> </ul>	<ul style="list-style-type: none"> <li>Remove cfc's and store for shipping</li> <li>Move white goods to recycle area</li> </ul>
Clean Fill	Uncontaminated soil	<ul style="list-style-type: none"> <li>Suitable for cover material on the landfill</li> </ul>	<ul style="list-style-type: none"> <li>Divert to soil stockpile at working face for use as cover material</li> </ul>
Combustibles	Carbide, metal dust, hot lime	<ul style="list-style-type: none"> <li>Combustible with water and air</li> <li>Risk to site employees and customers</li> </ul>	<ul style="list-style-type: none"> <li>Apply hazardous waste acceptance procedure</li> <li>Separate from other waste and cover with soil</li> </ul>
Compressed Gas Canisters	Propane bottles/tanks, industrial canisters, CFC canisters	<ul style="list-style-type: none"> <li>May be hazardous</li> <li>May contain CFCs</li> <li>May be dangerous to site employees and customers</li> </ul>	<ul style="list-style-type: none"> <li>Do not accept for disposal if containers hold any contents</li> <li>Do not compact</li> <li>Store for recycling if appropriate</li> </ul>
Construction and Demolition Wastes (Inerts)	Concrete, rocks, wood, glass, metals, asphalt, plastics	<ul style="list-style-type: none"> <li>Bulky materials may be difficult to spread and compact</li> <li>Consumes landfill space</li> <li>May contain hazardous wastes such as asbestos</li> </ul>	<ul style="list-style-type: none"> <li>Dispose mixed inert loads in landfill operating area</li> <li>Where practical, divert asphalt to a storage area for reuse</li> </ul>

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	Examples	Special Concerns	Handling Procedures
Electronic Waste	Televisions, radio, computers	<ul style="list-style-type: none"> <li>Some e-waste can contain lithium batteries</li> <li>Computers can contain damaged lithium batteries</li> </ul>	<ul style="list-style-type: none"> <li>Store separately in shipping containers</li> <li>Ship south for recycling when practical</li> </ul>
Empty Containers	45 gallon drums, 20 litre pails, etc.	<ul style="list-style-type: none"> <li>May contain prohibited wastes (liquids, hazardous products)</li> <li>May burst upon compaction and pose danger to site employees or customers</li> <li>Some “empty” containers may be still classed as hazardous wastes unless properly cleaned</li> </ul>	<ul style="list-style-type: none"> <li>Apply contaminated solids acceptance procedures</li> <li>Do not accept containers unless contents are known to be non-hazardous solids</li> <li>Do not compact sealed containers</li> <li>Determine original contents of the containers</li> <li>Look at container labels for original contents or warnings</li> </ul>
End of Life Vehicles	Hazardous waste e.g. fluids such as gasoline and oil.	<ul style="list-style-type: none"> <li>Proper handling of hazardous materials</li> </ul>	<ul style="list-style-type: none"> <li>Adhere to proper handling procedures outlined in this manual</li> </ul>
Explosives	shells, dynamite	<ul style="list-style-type: none"> <li>Prohibited from landfills</li> <li>May indicate criminal activities</li> <li>High risk to site employees and customers</li> </ul>	<ul style="list-style-type: none"> <li>Do not accept</li> <li>If unloaded, isolate the area from site employees and customers</li> <li>Contact RCMP</li> </ul>
Fire Place or Barbecue Ash	Ash	<ul style="list-style-type: none"> <li>Easily airborne</li> <li>If hot ashes exist, may ignite fires when unloaded</li> </ul>	<ul style="list-style-type: none"> <li>Accept with caution</li> <li>Do not unload directly on the working face</li> <li>Unload away from working face or other burnable items and only unload onto soil</li> <li>Ensure there are no hot coals present before incorporating onto the working face</li> </ul>
Fluorescent Light Bulbs	Light bulbs	<ul style="list-style-type: none"> <li>Contains mercury</li> <li>Can break easily</li> </ul>	<ul style="list-style-type: none"> <li>Store in a secure location (garage)</li> <li>Put fluorescent light bulbs through the Bulb Eater</li> <li>Store contained mercury for shipping</li> <li>Broken glass can be added to the municipal waste pile</li> </ul>
Household Hazardous Waste	Paints, solvents, oils, cleansers, pesticides, etc.	<ul style="list-style-type: none"> <li>Public is encouraged to separate HHW from municipal waste stream</li> <li>HHW is to be dropped off at the landfill by the Public</li> </ul>	<ul style="list-style-type: none"> <li>HHW has to be stored in a shipping container</li> <li>Ship south for proper disposal or recycling</li> </ul>

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	Examples	Special Concerns	Handling Procedures
Industrial Solids	Powders, shavings, granules, sands, or dry chemicals	<ul style="list-style-type: none"> <li>Dust is easily airborne</li> <li>May pose health risks to site employees and customers</li> <li>May be abrasive or corrosive to equipment</li> <li>May have hazardous properties</li> </ul>	<ul style="list-style-type: none"> <li>The facility does not accept industrial waste</li> </ul>
Land Clearing Debris	Soil, rocks, roots, , vegetation	<ul style="list-style-type: none"> <li>May be difficult to incorporate with refuse if it contains large solid materials</li> <li>Primarily clean soils (i.e. with limited vegetation ) may be suitable as cover material</li> </ul>	<ul style="list-style-type: none"> <li>Determine if suitable for cover material if material is suitable as cover material, direct it to soil stockpile at working face for use as cover material</li> <li>If material is unsuitable as cover material, dispose of it as inert waste</li> </ul>
Lead Acid Batteries	Automobile, truck, and equipment batteries	<ul style="list-style-type: none"> <li>Wet cell batteries contain acids</li> <li>Contain lead</li> <li>May spark upon compaction and ignite fires</li> </ul>	<ul style="list-style-type: none"> <li>Store on wooden pallets in recycling compounds</li> <li>Place batteries into battery bags for shipment south to recyclers</li> <li>Provide secure storage using a sea Can</li> <li>Store as per Transportation of Dangerous Goods</li> <li>See Appendix K</li> </ul>
Lithium-Ion Batteries	Re-chargeable batteries, computer batteries	<ul style="list-style-type: none"> <li>Damaged batteries</li> <li>Fire risk if damaged and subject to moisture</li> </ul>	<ul style="list-style-type: none"> <li>Must be stored separate from other batteries.</li> <li>Damaged batteries must be stored separately.</li> <li>Handling damaged batteries requires PPE</li> <li>See Appendix K</li> </ul>
Mattresses	Mattresses, box springs	<ul style="list-style-type: none"> <li>Difficult to handle in working face</li> <li>Box springs may bind up in equipment</li> </ul>	<ul style="list-style-type: none"> <li>Dismantle mattresses</li> <li>Place steel springs into scrap metal storage area and remaining material can be disposed of at the working face.</li> </ul>
Municipal Solid Waste (MSW)	Household refuse, commercial refuse including paper, food wastes, yard wastes, metals, plastics, glass, and other refuse	<ul style="list-style-type: none"> <li>Bulky items may bridge over other wastes thereby reducing compaction</li> <li>Potential for odours and attraction of vectors</li> <li>Potential for blowing litter</li> </ul>	<ul style="list-style-type: none"> <li>Spread in thin layers on the working face and compact</li> <li>Apply cover material</li> </ul>
Organic Waste	Household organic waste, gardening residue, soil	<ul style="list-style-type: none"> <li>Potentially compostable material</li> </ul>	<ul style="list-style-type: none"> <li>Place in working face</li> </ul>

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	Examples	Special Concerns	Handling Procedures
Paint and Paint Cans		<ul style="list-style-type: none"> <li>• Paint cans may not be empty</li> <li>• Paint may not be dry</li> </ul>	<ul style="list-style-type: none"> <li>• If paint cans are empty and dry, direct to working face for landfilling</li> <li>• Paint cans that are not empty and/or that contain wet pain must be placed in the shipping container and shipped south for recycling</li> <li>• May solidify paint by drying or adding cement powder before landfilling</li> </ul>
Sewage Sludge	Municipal Sewage Sludge from the Wastewater Treatment Plant	<ul style="list-style-type: none"> <li>• Heavy metals</li> </ul>	<ul style="list-style-type: none"> <li>• Treatment plant should make prior arrangements for disposal at the end of the day</li> <li>• Prior to arranged delivery time prepare a location in the working face for disposal, set aside a waste collection truck load of waste</li> <li>• Sludge to be placed in the prepared disposal area and immediately covered with the waste that was set aside.</li> </ul>
Used Oil (incl. filters, oil containers)	Engine and transmission oil	<ul style="list-style-type: none"> <li>• Liquid waste</li> <li>• Possibly flammable</li> </ul>	direct customers to used oil drop facility
Used Tires	Passenger car and small truck tires (15 inch or less), medium truck (up to 19 inch), OTR tires (large equipment tires)	<ul style="list-style-type: none"> <li>• Bulky and consume landfill space</li> <li>• Tires do not tend to stay buried but work their way to top of disposed waste material</li> </ul>	<ul style="list-style-type: none"> <li>• All tires accepted</li> <li>• Tires are not to be disposed of at the working face</li> <li>• Tires to be immediately loaded into a shipping container</li> <li>• When shipping container filled arrange for shipment south to recycler</li> </ul>
Wood Waste	scrap lumber	<ul style="list-style-type: none"> <li>• Difficult to incorporate into general refuse</li> <li>• Consumes landfill space</li> <li>• Divert treated wood to construction and demolition material area</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporate into the working face</li> <li>• Wood waste can be crushed with the compactor and mixed with soil material and used as cover material</li> </ul>

## 9. Operational Procedures

### 9.1 Operating Principles

The Landfill is to be operated by the following principles:

- Appropriate staff are on-site during operations hours
- Access to the Landfill is controlled
- Only approved or authorized waste is accepted for storage or disposal
- The Landfill is developed according to the engineering plans and fill plans
- Wastes are compacted to the greatest practical density
- Wastes are covered as necessary to control nuisances
- Surface water is managed and controlled within the requirements of the City's Water License
- Safe operating practices are followed, and all Landfill personnel are encouraged to improve their skills and knowledge
- Records are maintained with respect to operations activities and site development
- Landfill operations are managed by a Landfill Operator

### 9.2 Landfill Staging

Refer to the fill plans and Landfill Decommissioning Plan for detailed Landfill staging and fill sequencing.

### 9.3 Traffic Control

#### 9.3.1 Signage

Signs should be posted throughout the Landfill to inform and provide directions to customers for the appropriate locations for unloading. See the following table for recommended signs and placement.

**Table 4: Recommended Signs and Placement**

Location	Purpose	Type
At Highway	Direction Board	Permanent
At Gate	Name of Site; Operating Hours; Emergency Numbers; Safety Notices; Prohibited Waste	Permanent
Waste Oil Storage	Accepted Products	Permanent
Tire Storage	Sign boards for passenger tires, truck tires, and off-road tires	Portable
Metal Storage	Acceptable Metals	Permanent
Working Face	Direction Signs; Safety Signs	Portable
Access Roads	Direction Signs; Speed Signs	Permanent
Battery Storage	Sign Board	Permanent
E-Waste: monitors, TV, computers, etc.	Sign Board	Permanent
White Goods: refrigerators, stoves, dishwasher, etc.	Sign Board	Permanent

### 9.3.2 Traffic Control at the Entrance

The Landfill Foreman should provide directions to Landfill customers upon entrance to the Landfill. Directions should include:

- General directions to the proper location for unloading vehicles
- To follow direction signs to the appropriate location
- To follow the instructions of operating staff
- Any special instructions that apply to the load carried

All loads of waste delivered by self-haul customers are to be inspected and the waste screening form completed.

All City waste collection trucks are to be log in using the Waste Truck Load Record form.

### 9.3.3 Traffic Control at the Working Face

During hours of operation, it may be necessary to direct traffic at the working face. When directing traffic, the Landfill Operator should:

- Always ensure his/her own personal safety when directing traffic
- Always face the movement of traffic
- Coordinate the flow of traffic to the working face including holding vehicles at a “staging” area until space is available for unloading
- Direct vehicles to an area where it is safe to unload
- Direct vehicles to areas where landfill equipment is not operating (at least 3 metres separation from operating equipment)
- Direct trailer units into an area where they have room to manoeuvre into position, without jack-knifing, for dumping
- Direct customers with hand signals, when appropriate, for safety reasons
- Encourage customers to unload quickly and in a safe manner to allow access to other site users
- Direct vehicles that will take more time to unload to an area where they will not interfere with other vehicles and will not cause delays to other customers

## 9.4 Tipping Fees

Rates are outlined by the Solid Waste Bylaw (see Appendix E).

## 9.5 Disposal Area and Working Face

The municipal solid waste disposal area is the largest area at the Landfill. Residential, restaurant, institutional, commercial and construction wastes are placed here. The site is surrounded by drainage ditches which contains runoff on-site until the run-off is pumped to the off-site retention pond. This area is also surrounded by berms and fencing to minimize windblown debris.

Part of the disposal area is working face area and is defined as the active portion of the Landfill where wastes are disposed of by spreading and compacting with landfill equipment. The Landfill is designed and constructed using the area fill concept. The working face shall be kept to a minimum. A narrow daily disposal area will help reduce litter and cover material (mulch of wood, furniture, mattresses and plastic) use.

The width of the working face depends primarily on the traffic volume and should be wide enough to allow the day's maximum number of trucks to unload. Allow 4.5 to 5 metres (15 to 18 feet) per truck.

For efficient operations of compaction equipment, the working face should generally be constructed on a 25% (4H:1V) to 35% (3H:1V) slope. Typically, vehicles are to be unloaded at the bottom of the working face and waste is to be pushed up the slope.

Only one working face for municipal solid waste should be active at any one time, except where the Landfill Operator may designate additional working faces, as necessary, for the following reasons:

- Allow access during adverse weather (e.g. the active working face may become inaccessible)
- Manage higher-than-normal traffic volumes
- Provide adequate separation of commercial and public vehicles for safety purposes
- Ensure the safe handling of hazardous wastes

## 9.6 Waste Placement Procedures

The Landfill shall be developed in accordance with Landfill site development as provided by the fill plans which are updated on a regular basis.

The working face area shall be compacted regularly to maximize density (thereby minimizing the disposal area), minimize cover requirements, and reduce bird attraction and odour. The compacted waste area is then covered with cover material to minimize the problems of odour, birds, and flies. Material cover also provides surface drainage from the finished surface, thereby reducing infiltration and subsequent leachate production.

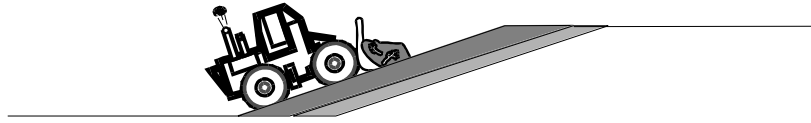
To monitor filling and monitoring airspace usage, the Landfill management should conduct topographic surveys to calculate the amount of airspace consumed, on an annual basis. The Landfill management may also conduct random audits throughout the year.

Compaction of solid waste is required to:

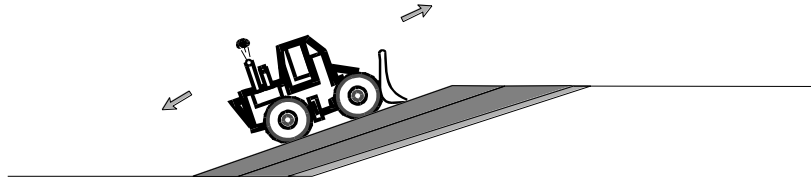
- Maximize waste density to optimize utilization of the Landfill airspace
- Minimize daily cover by providing an even surface on which cover is placed
- Reduce the potential for wind-blown litter

Figure 9-1 illustrates typical compaction procedures.

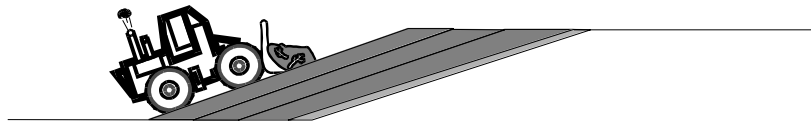
### Figure 9-1: Compaction Procedures



SPREAD WASTE UPHILL IN THIN LAYERS (0.5 M)



COMPACT EACH LAYER WITH 3 - 5 PASSES



BUILD SUCCESSIVE LAYERS

Once compaction is complete, cover material should be placed to cover the wastes on a regular basis. Cover the compacted waste with a minimum 150 mm of the cover material (mulch of wood, furniture,). Ideally cover waste once per month during the summer months. Due to frozen soil during winter months regular placement of cover soil is not practical, however the waste deposited during winter months should be covered as early in spring as practical. Each layer of solid waste and cover material will be sloped towards the collection ditches to allow drainage. A compaction and covering cycle is to be completed in the fall to prepare for the onset of winter.

Cover applications at the Landfill include:

- A cover once per month during the summer months
- Cover prior to winter freeze up and early in the spring
- A final cover when the Landfill is closed

## 9.7 Cover Material Management

Properly placed cover material at a landfill is important to a well-run landfill. Improperly placed cover material results in increased operational costs and in the needless loss of valuable airspace.

Factors that affect soil consumption include:

- Compaction of the wastes
- Thickness of cover material
- Surface of the wastes
- Working face and operating area dimension

## 10. Nuisance Management

### 10.1 Litter Control

The **first level of litter control** involves actions to monitor that loads on vehicles hauling to the site are secured to prevent waste from falling or blowing onto roads leading to the site.

The **second level of control** is applied at the working face by directing vehicles to sheltered areas where possible, and by compacting and covering wastes.

The **third level of control** is retrieving litter that accumulates in site fencing, along roads leading to the site, on the site, or on adjacent lands.

The Landfill Foreman is responsible for patrolling and either cleaning or arranging for cleaning of:

- The access road and road leading to the site
- On-site permanent and temporary roads
- The Landfill property
- Adjacent lands around the perimeter of the Landfill

Should any loads be “illegally” unloaded along roads leading to the site or at entrance gates or fence lines along the property, the waste load should be inspected for any identifying wastes (i.e. addressed envelopes, utility bills, etc.) and the City of Iqaluit Municipal Enforcement Officer should be contacted. This waste must be cleaned up immediately to comply with operating and approval requirements.

#### 10.1.1 Use of Portable Litter Screens

Portable litter screens are to be deployed to enhance the “second level of control” at the tipping face. For the screens to provide effective litter control they must be deployed in a manner that provides maximum effectiveness. This deployment includes the following procedures.

1. Screens must be deployed\positioned on the down wind side of the tipping face. This requires the operators to relocate and position the screens as wind direction changes. Operators must be diligent in changes to wind direction and moving the screens as wind direction dictates.
2. Litter screens must be positioned as close as possible, and practical, to the working face to be effective.
3. Litter must be removed from the litter screen on a regular basis as the screen becomes plugged. Failure to do this will result in a plugged screen that will allow litter to be blown over and around the screen.

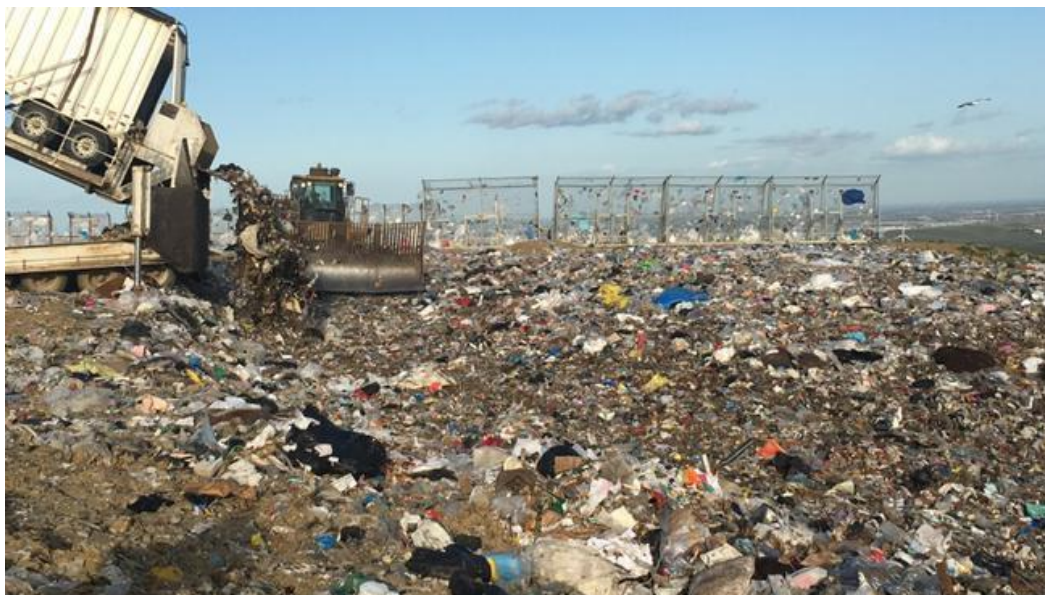
The following pictures provide examples of adequate portable litter screen deployment.



Litter screen positioned down wind of tipping face, near the tipping face. As wind direction changes screens portable require re-positioning. Photograph courtesy of Contained Waste Solutions



Litter screens deployed to encircle the tipping face. Portable screens would require re-positioning as wind directions changes. Photograph shows effective deployment of portable screens. Photograph courtesy Metta Technologies



Portable litter screens positioned down wind of tipping face. Photograph courtesy Metta Technologies

## 10.2 Dust

Dust is generated by:

- Traffic dust on access roads
- Unloaded powdery or fine grained wastes
- Soil blowing from stockpiles or soil cover

Dust blowing from wastes may be controlled by:

- Unloading in a sheltered area away from the public disposal areas
- Requiring the waste generator/hauler to moisten or wrap the waste prior to delivery to the Landfill
- Covering the waste with other waste or cover material as soon as possible after unloading

Traffic dust may be minimized by:

- Reducing vehicle speed limits on gravel roads
- Applying water or dust suppressant to gravel road surfaces in hot dry weather

Soil stockpiles should be maintained to prevent blowing soil.

## 10.3 Noise

The Landfill is located in an isolated location away from any residential development and off-site noise is not anticipated to be of concern. Noise caused by operating equipment and vehicles may affect employee hearing, therefore, employees must comply with hearing protection PPE requirements as per the City H&S policy .

## 10.4 Odours

Odour issues can result in public complaints, negative public perception of the landfill operations, and nuisances to those who are most affected. Odours are more common in warm weather, during temperature inversions, and with breezes that carry odours from the site.

Odours are caused by:

- Decomposition of organic wastes
- Disposal of waste products with strong odours (dead animals, sludges, etc.)
- Chemical reactions in the landfill
- Stagnant water

Odours may be controlled through:

- Applying intermediate soil cover with the advance of the working face
- Immediately covering any wastes that, by their nature, emit strong odours (cover either with soil or other wastes)
- Working with waste generators to reduce odours at the source
- Immediately correcting any runoff seepage that may develop.

## 10.5 Animals

A fence has been constructed around the perimeter of the site. This fence should be inspected on a regular basis to determine if there has been any breach of the fence. Any breach of the perimeter fence should be reported and arrangements made to repair as soon as possible.

## 10.6 Animal and Insect Controls

Following are “best management” approaches to minimizing the potential of an animal and insect infestation:

- Eliminate areas of ponded water other than designated retention ponds (insects and animals require water)
- Maintain a small working face
- Continue compaction of wastes
- Apply intermediate cover as the working face advances
- Apply soil or alternative cover where wastes once per week during the summer months, or more frequently as required

Should the Landfill Operator notice any signs that may indicate a rodent infestation or bear activity, he/she shall take action immediately. If a rodent extermination program is necessary, expert advice should be consulted. In the event of bear issues, the Department of Environment Wildlife Office should be contacted at (867) 975 - 7780.

## 10.7 Fires

Fires are included as a nuisance because of issues with safety, air quality, property damage, and general nuisances to site employees, customers, and neighbours. Fires are caused by:

- Hot loads unloaded at the working face
- Chemical reactions with a particular type of waste (lithium batteries, oxidizer chemicals)
- Intentional ignition
- Smoking (cigarette butts tossed onto the working face)
- Flammable debris on hot parts of the landfill equipment

Should a fire occur, procedures outlined in Section 16.2 – Fire Management, should be implemented.

## 11. Surface Water Management

The Surface Water Management Plan for the West 40 Landfill is designed to manage both run-on water and run-off water. Figure 1 in Appendix J illustrates the Surface water Management System.

**Run-on** water is defined as all surface water that could potentially enter the landfill from off site sources.

**Run-off** water is defined as all surface water that could run-off the landfill onto adjacent property. This run-off water consists of two sources.

- Noncontact water: surface water that runs off that area of the landfill that contains no waste or has an intermediate cap in place, and
- Contact water: surface water that runs off that area of the landfill that is actively being filled and has no intermediate cap, allowing the run-off water to encounter waste and is treated as leachate.

The surface water management area of the landfill site is divided into three (3) areas:

- North Drainage Area: landfill entrance and storage area which does not contain any exposed waste and run-off is considered as non-contact run-off,
- Active Landfill Area: area contains waste and run-off is considered contact water and treated as leachate.
- East Bed Rock Surface: Run-on water that encounters waste, managed as leachate,

### 11.1 Run-On Water

Run-on water is prevented from entering the landfill and therefore contact with waste by the north berm, east berm, south berm, and west berm. This water is left to flow naturally to Koojesse Inlet. Run-on water from the East Bedrock Surface that comes into contact with waste is captured and diverted to the On-Site Leachate Holding Pond to be managed as leachate. Refer to Figure 1.0 for flow details.

### 11.2 Run-Off Water

The landfill run-off is managed by two separate areas. The North Drainage Area and the Active Landfill Area.

#### North Drainage Area

The North Drainage Area is the landfill entrance and contains the recycle storage containers. Run-off from this area does not come into contact with waste. As this run-off is deemed to be non-contact any run-off is allowed to flow into the Akilliq Drive Road ditch. This run-off then eventually flows into Koojesse Inlet.

#### Active Landfill Area

Run-off from the Active Landfill Area is controlled by a system of perimeter berms, the North Berm, the East Berm, the South Berm, and the West Berm. All surface water that runs off, or percolates through, the waste is captured by these berms and diverted to the on-site holding ponds. The landfill has two (2) Holding Ponds.

- **West Run-Off Holding Pond** captures any run-off that flows off the west surface of the landfill. Any water that accumulates in this temporary holding pond must be pumped on an as required basis to the **On Site Leachate Holding Pond**.

- **On Site Leachate Holding Pond** captures and holds the run-off and leachate that flows from the waste. Any run-on from the east bedrock surface that contacts waste is also captured and held in the pond. On an as required basis the water/leachate in the pond is pumped across Akilliq Drive to Retention Pond 1. When water is being pumped from the pond it must be sampled and analysed as per Section 15.7 Monitoring. This monitoring location is identified as IQA-08 in the Water License. Refer to Figure 1.0 in Appendix J for flow details.

## 12. Landfill Leachate Management and Storage

Leachate and surface water run-off from the Landfill is collected as described in Section 11. Any leachate pumped from the landfill **On Site Leachate Pond** is first pumped to **Retention Pond 1**. The leachate is retained in **Retention Pond 1** until the pond reaches maximum capacity. Based on past performance the leachate is retained for approximately 2 to 4 years. The pond has a capacity of approximately 5, 000 cubic meters.

When **Retention Pond 1** reaches capacity, the leachate is pumped to **Retention Pond 2**. The leachate is retained in Retention Pond 2 until the pond reaches capacity, which is estimated to be from 2 to 4 years. When the pond requires discharge, it is pumped to discharge into Koojesse Inlet. As per agreement with CIRNAC when **Retention Pond 2** is discharged testing and analysis will be conducted meeting the criteria for Sample Point IQA-08.

The procedure for operation of **Retention Pond 1** and **Retention Pond 2** shall be:

- Pump to discharge **Retention Pond 2**, test as per criteria for Sample Point IQA-08.
- Pump **Retention Pond 1** into **Retention Pond 2**, no testing is required.

## 13. Landfill Safety Plan

This section is to be read in conjunction with the City of Iqaluit safety requirements.

### 13.1 Introduction

Due to the nature of the facility, safety precautions should be taken by those personnel involved in the operation and maintenance of the Landfill. All personnel should be familiar and abide by the City of Iqaluit Occupation Health and Safety Program, which contains information such as training requirements, personal protective equipment requirements, WHMIS & Transportation of Dangerous Goods, Chemical Storage & Fire Protection, and First Aid. All personnel should be familiar and abide by the Nunavut Safety Act and Regulations.

Some of the safety precautions which Landfill personnel should follow include:

- Water and puncture proof gloves, coveralls, and safety boots are to be worn at all times
- Eye Protection and hard hats are recommended
- Work clothes should not be worn home
- Hands are to be washed frequently, as a minimum after work and before eating
- An appropriate fire extinguisher and a No. 1 First Aid Kit should be available at the site operators buildings
- Personnel should receive appropriate vaccinations and ensure they are kept up to date
- Proper lifting techniques should be exercised, lift with your legs and not your back
- Only personnel trained to handle hazardous materials should do so

Management is responsible to maintain an effective health and safety program, and provide the equipment, materials and training necessary to promote safe work practices and environments.

Supervisors are responsible to ensure that workers are supplied with the proper equipment and materials to conduct work safely, and to ensure that workers are trained in and follow established safe work procedures.

It is the duty of every worker to assume responsibility for their own safety by complying with legislative, company and industrial standards as well as the prompt reporting of all unsafe acts or conditions to supervisors to ensure immediate action and resolution.

### 13.2 Purpose

The City of Iqaluit Municipal Landfill Safety Plan is intended to:

- Provide guidance and instructions for Landfill Operator on safety-related matters
- Aid Landfill Operator in identifying potentially dangerous situations and taking appropriate action

The safety of site operating staff and the public is of prime importance at all times. Site employees shall not endanger themselves or others on the site. Employees are obligated to report unsafe practices and are empowered to notify other employees or site users acting in an unsafe manner. All accidents, injuries, or near misses are reported to the Landfill and the following steps are taken:

- Investigate the incident immediately
- Determine the cause
- Complete the accident/incident report
- Take immediate measures to correct the cause and prevent it from reoccurring
- Have a safety meeting with employees as soon as possible after the incident

### 13.3 Safety of Site Users

By the very nature of its business, a landfill can be a very busy place with continual movement of various types of vehicles. It is the Landfill Operator's responsibility to maintain the safety of the site users by informing users of the landfill rules and monitoring that the rules are conformed to. To protect the safety of site users, the following basic rules shall apply:

- Children, pets, and individuals not unloading waste must remain in vehicles
- Only adults are allowed to unload vehicles in areas as directed by Landfill Operator
- Wastes shall be unloaded to the rear of vehicles and not strewn about
- Smoking at the unloading area is not allowed - the site is non-smoking in all areas;
- No scavenging is allowed
- Users must leave unloading area immediately after unloading vehicles, unless advised to stay for inspection

To protect the safety of site users, the Landfill Operator shall:

- Control access to the site
- Inform users of the rules upon reporting to the office
- Post and maintain adequate directional signs
- Enforce the site speed limit
- Maintain an orderly site
- Immediately inform users of unsafe practices

### 13.4 Working Safely Around Public Vehicles

Important considerations for working around the public include:

- The actions of the public are unpredictable.
- Never stand/go/run behind vehicles. Keep the tipping area clear and level so vehicles can have easy access.
- Potentially dangerous loads may include lumber, pipe, brush, or other materials; when unloaded without care these could harm persons or vehicles. If possible, spot these loads for unloading in a separate area away from other landfill users. If space does not allow this, do not allow these loads to unload until the area is safely clear of any other users.
- Avoid pushing waste around the unloading vehicles.
- Keep the working area free of glass, pipe, wire, wood, and other debris that could cause tripping hazards, and/or foot puncture hazards.

### 13.5 Safe Equipment Operations

- Machines shall be operated only by individuals who are properly trained and fully understand the machine.
- Perform a pre-check walk-around every time you get on the equipment near the working face;
- Check breaking system.
- Always use seat belt.
- Clean windows and adjust mirrors for best vision.
- No machine shall be operated unless all safety devices are operational and in good repair, i.e. brakes, backup alarms, fire extinguishers, lights, horn, etc.
- Check site for unsafe operating conditions such as large bulky items that will cause equipment instability.

- Ensure area around the machine is clear before moving.
- Use stepping points and handholds when mounting and dismounting equipment.
- Do not crush sealed containers with unknown contents.
- Always use caution around site users who may not be aware of dangers.
- When parking the equipment always:
  - Park on a level surface.
  - Lower blades, buckets.
  - Move transmission lever to park.
  - Apply the parking break.

## 13.6 Personal Protective Equipment

Appropriate personal protective equipment (PPE) for Landfill site work includes the following:

- Approved safety boots.
- Coveralls.
- Gloves.
- Safety goggles.
- Earplugs (when around loud equipment).
- Safety vest.
- Dust masks (when in dusty surroundings).

Special safety equipment may be required for dealing with fires and other incidents.

## 13.7 Safety Supervision

Site safety at the Landfill is coordinated through the Landfill Operator. All operations are to be conducted with safety as a priority at all times.

The safety of site operating staff and the public is of prime importance at all times. Site employees shall not endanger themselves or others on the site. Employees are obligated to report unsafe practices and are empowered to notify other employees or site users acting in an unsafe manner. All **accidents, injuries, or near misses** are reported to the Landfill Foreman, the Director of Public Works and the City's Safety Officer, and the following steps are taken:

- Investigate the incident immediately.
- Find out the cause.
- Make a complete accident report.
- Take immediate measures to correct the cause and prevent it reoccurring.
- Have a safety meeting with employees as soon as possible after the incident.
- Submit report to WSCC.

## 13.8 Landfill Accidents

### Accidents

Accident frequency for landfills tends to be higher than for most other construction industries. This is generally due to the nature of the waste and the fact that garbage is unpredictable and potentially dangerous.

All accidents at the Landfill will be investigated and an Accident Report Form for the incident will be completed. Complete the form providing as many facts as possible; provide only the facts. Do not place blame or fault, and include the following information as required on the form:

- Who was involved?
- Which vehicles were involved?
- Were there any personal injuries?
- What property was damaged?
- Which agencies or individuals responded to the accident?
- Date, time, weather conditions, witnesses, and other pertinent information.

## 13.9 Landfill Emergencies

Landfill Emergencies should be dealt with according to the Landfill Emergency Response Plan (see Appendix G) which sets out appropriate procedures to address foreseeable emergencies. The key elements of this plan are:

1. What is the nature and severity of the emergency?
2. What is to be done?
3. Who does it?

The emergency response plan addresses the following items:

- Fires
- Accidents and Medical Emergencies
- Environmental and Operational Emergencies

During any landfill emergency, the press will likely become aware and cover the story. NOTE: Do not make any statement or comment to the press without approval of the Director of Public Works. The Director will be the only spokespersons for the City of Iqaluit Waste Management (Department of Public Works).

## 13.10 Personal Decontamination Procedures

In instances where workers accidentally come in contact with unknown substances, the following procedures are to be followed. As well the Landfill Foreman should fill out the Incident Report

### Skin Contact

- Wash with water for approximately 15 minutes. See a physician if any sign of irritation occurs.

### Eye Contact

- Flush eye(s) with a gentle stream of water for 15 minutes. See physician immediately.

### Ingestion

- Contact emergency services immediately and provide them with as much information as possible about the product that was ingested. Do not induce vomiting unless instructed to do so.

### Inhalation

- Remove person to fresh air. If discomfort persists, take victim to physician. Provide physician with as much information on the inhaled material as possible.

## 13.11 Contacts

This section provides a list of those individuals to be contacted under various conditions. NOTE: In all accidents that involve injuries and/or alcohol, call the RCMP.

If an accident occurs on-site, contact:

- Landfill Foreman
- Emergency and Protective Services of the City
- Department of Public Works
- Any employees which may be impacted
- Nearby employees who are trained to respond to this type of emergency

If there are injuries, contact:

- Iqaluit Emergency Services
- The RCMP (fatality)
- Landfill Foreman
- Superintendent

## 13.12 Telephone Numbers

- Emergency Services Dispatch/Ambulance/Fire Department: (867) 979-4422
  - Fire Fighters (general): (867) 979-5650
  - RCMP: (867) 979-1111
  - Public Works Administration: (867) 979-5630
  - Spill Line 24 hours
    - Tel: (867) 920-8130
    - Fax: (867) 873-6924
- E-mail: [spills@gov.nt.ca](mailto:spills@gov.nt.ca)

## 14. Landfill Closure

### 14.1 Closure

When a new solid waste management facility is opened and this facility closes, it will be decommissioned according to a Decommissioning Plan. The plan will be prepared at least one (1) year prior to landfill closure. As each area is completed, the perimeter slopes and surfaces should be reclaimed. In this way the Landfill is closed and reclaimed progressively throughout the active landfill life.

## 15. Record Keeping and Reporting

Landfill management must establish and maintain an operating record and prepare required reports. Record keeping and reporting is an important part of landfill operations.

### 15.1 Daily Operator Log

The Landfill Foreman will maintain a record of daily operating activities. The log will be maintained in the Landfill site building/office and submitted to the Superintendent at the end of the month. Daily records include, but are not limited to:

- Weather conditions (i.e. precipitation, wind speed and direction, temperature)
- Operating staff on-site
- Equipment on-site
- Operations activities (waste placement, compaction, sorting, recycling, site clean-up, etc.)
- Monitoring (visual or measured)
- On-site issues encountered and response or corrective action taken

### 15.2 Load and Load Inspection Records

Load records are maintained at the site and kept on file at the Landfill Foreman's Office.

Local records generally include:

- Time and date of delivery
- Waste hauler or customer
- Volume of waste
- Type of waste
- Fees collected

### 15.3 Annual Report

The annual operations report will be prepared by the Superintendent and will include:

- A record of the amounts and types of wastes received, disposed, stored, or recycled at the Landfill
- Major incidents, and corrective actions taken, if applicable
- Locations of waste disposal
- Record of public complaints and response actions
- Annual environmental compliance audits
- Current operations and design plans
- As-built drawings and survey records
- Environmental monitoring results
- Spill Reports

The environmental annual report, which includes groundwater monitoring report, shall be submitted to the Engineering Department for inclusion in the Department's annual report to the NWB. The annual operations report must meet the requirements prescribed in the City of Iqaluit Water License.

## 15.4 Engineering Reports

Engineering reports will be developed where new construction activities occur and will include:

- As-built drawings and records;
- Current design plans and reports; and
- Construction QA/QC procedures, results, and survey records.

All Engineering reports must be submitted to the NWB as per Water License requirements.

## 15.5 Corrective Action Report

In the event that a corrective action is undertaken, the corrective action shall be documented and maintained in the operating record. A corrective action report may include:

- A description of the problem;
- A description of activities and results; and
- A description of the monitoring and effectiveness of the corrective action.

## 15.6 Spill Reporting

In the event of a substance release, the Landfill Foreman shall immediately notify the Superintendent and the City's Spill Contingency Plan should be implemented (see Appendix H). The spill must be reported to the 24 – Hour Spill Report Line. The Foreman must call and fill out the spill response forms as provided by Nunavut Environment at the following web page: <https://www.gov.nu.ca/environment/documents/spill>. The NT-NU Spill Report is also provided in Appendix B.

## 15.7 Monitoring

The City of Iqaluit is required to provide monitoring at the West 40 Landfill as per The Type "A" Water Licence No. 3AM-IQA1626, Part I and Schedule I.

The landfill is to be monitored at four (4) locations:

- IQA-08: Discharge from the leachate discharge location in the landfill run-off detention pond/ditch to **Retention Pond 1**
- IQA-08A: Station located up-gradient of the Landfill
- IQA-08B: Station located down gradient of the Landfill
- As per agreement with CIRNAC when discharging **Retention Pond 2**, test as per discharge and analysis criteria for IQA-08

A plan showing the monitoring locations is provided in Appendix I.

### 15.7.1.1 Monitoring Station IQA-08

Monitoring Station IQA-08 is located in the landfill **On Site Leachate Holding Pond** at the south end of the landfill which is used to collect landfill on-site runoff. Any water collected in this pond is pumped on a as required schedule, to **Retention Pond 1** located across Akilliq Drive.

When pumping from the **On Site Leachate Holding Pond** to **Retention Pond 1** occurs, testing of the water is to occur:

- Once prior to pumped discharge to **Retention Pond 1**
- Once during pumped discharge to **Retention Pond 1**

The samples are to be collected mid-depth in the ponded water. Testing results are to be provided in the Annual Report. The following table provides the testing requirements.

**Table 5: Water Testing Parameters**

Test Group	Analytical Parameters	Units
Biological (B)	Biochemical Oxygen Demand	Mg/L
	Total and Fecal Coliform	CFU/100mL
Effluent (E)	Total Suspended Solids (TSS)	Mg/L
	Temperature (field)	°C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	Mg/L
ICP-Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, PB, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	Mg/L
Flow (F)	Volume	M <sup>3</sup>
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs)	Mg/L
	Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	

As per Licence Part E (4) the water within the pond is to meet the following criteria

Parameter	Maximum Average Concentration	Maximum Concentration of Any Grab Sample
Total Suspended Solids (TSS)	50.0 mg/L	100.0 mg/L
pH	Between 6 and 9	

### 15.7.1.2 Monitoring Stations IQA-08A and IQA-08B

Monitoring Station IQA-8A is located in the road ditch up stream of the landfill, and IQA-08B is in the road ditch downstream of the landfill. Water is to be sampled at these locations once per year, in the spring, when there is run-off flowing in the ditches.

Testing results are to be provided in the Annual Report. The following table provides the testing requirements.

**Table 6: Water Testing Parameters**

Test Group	Analytical Parameters	Units
Biological (B)	Biochemical Oxygen Demand	Mg/L
	Total and Fecal Coliform	CFU/100mL
Effluent (E)	Total Suspended Solids (TSS)	Mg/L
	Temperature (field)	°C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	Mg/L
ICP-Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	Mg/L
Flow (F)	Volume (flow estimated)	M <sup>3</sup>
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs)	Mg/L
	Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	

## 15.8 Water License Reporting Requirements

The City's Water License has specific reporting requirements for the West 40 Landfill (see Appendix F for the Water Licence). This reporting includes:

- Water monitoring reports
- Emergency discharge reports
- Engineering design reports (for planned work) and as-built drawing (for completed work)
- Annual Operation and Maintenance Manual revisions
- Follow up on Water Inspector orders/directives
- Shipping of recyclables
- Shipping of hazardous waste
- Abandonment and restoration

## 15.9 Health and Safety Program Records

Health and Safety Program Records must be maintained as per the City's Health and Safety Program, the Nunavut Health and Safety Act and Regulations, and WSCC requirements. These include but are not limited to the following types of records:

- Daily vehicle/equipment inspections
- Safety meetings
- Incident reports (accidents/near misses)
- Site safety inspections
- Equipment maintenance

# Appendix **A**

## Policies



**CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Contaminated Rags Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To define acceptable procedures for acceptance and disposal of oily rags.

**POLICY:**

1. Contaminated rags generally means cloth materials that have been used in industrial applications for cleaning or spill cleanup purposes.
2. This policy does not apply to small quantities of rags that are normally deposited in waste receptacles at a household or business, but applies to large quantities that are generated as a result of a spill clean-up or that have been stored at an industry or business separately from the normal waste stream.
3. The waste generator must provide a full and complete description of the contaminant and include a waste analysis.
4. If the contaminated rags contain a prohibited waste (i.e. hazardous waste), then they must not be accepted at the landfill.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Automobile Batteries Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To establish the storage and management of automobile batteries for recycling.

**POLICY:**

1. Automobile and lead batteries will be accepted at the landfill from residents for recycling purposes.
2. Batteries will be placed at the hazardous wastes temporary storage area.
3. Batteries will not be accepted at the landfill from commercial businesses.
4. All efforts will be made to encourage landfill customers to separate batteries from other waste.
5. Batteries accepted for recycling will be stored:
  - a. On wooden pallets placed over a lime pad;
  - b. In a sheltered area; and
  - c. Covered with a tarp or plastic or placed in a weather-proof structure.
6. Recycling of automobile batteries will be coordinated by the Superintendent in accordance with contractual agreements.

**RESPONSIBILITIES:**

- .1 The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Key and Gate Lock Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To maintain control of access to the site after hours in order to minimize liabilities to the landfill.

**POLICY:**

1. Customers requesting access to the landfill outside of the established operating hours shall arrange for the time of access with the Landfill Foreman.
2. The Landfill Foreman shall be present at all times, when after hours access is provided, they will remain on-site until the customer has left the site.
3. Customers requesting after hours access shall pay an hourly rate of \$ \_\_\_\_\_ to the Landfill Foreman for the period of time the employee is required at the site, with a minimum charge of 1 hour per entry, and shall pay the landfill tipping fee as set out in the Tipping Fees Policy.
4. The customer shall notify the Landfill Foreman at least **4 hours** in advance of requiring access to the site outside the established operating hours.

**RESPONSIBILITIES:**

1. The Landfill Foreman will be responsible for scheduling any after hour access times with the customer and shall maintain a record of the customer and time incurred.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Visitor Record Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To maintain a record of site visitors for site safety.

**POLICY:**

1. In this Policy “visitors” means those persons that are non-customers and may include:
  - a. City employees and councillors;
  - b. Consultants;
  - c. Environmental Protection Service Inspector;
  - d. NWB Officer;
  - e. Scheduled tour groups; or
  - f. Other non-customers.
2. All visitors will report to the Landfill Foreman at the landfill office and will sign a visitor registry that includes the person’s name, time of entry, and purpose of the visit.
3. All visitors will report to the Landfill Foreman upon leaving the site and will initial and enter the time of departure on the visitor registry.
4. Prior to departure from the site, the Landfill Foreman will check the visitor registry to make sure all visitors have signed out.

**RESPONSIBILITIES:**

1. The Landfill Foreman will maintain the visitor registry.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Tipping Fees Policy	<b>Page:</b> 1 of 2

**PURPOSE:**

To establish tipping fees charged to commercial customers for use of the landfill.

**POLICY:**

City of Iqaluit shall establish the tipping fee.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible to review tipping fees and recommend alternate tipping fees to the CAO.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Prohibited Waste Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To define waste that is prohibited from disposal at the landfill.

**POLICY:**

Prohibited waste is all substances and materials listed below:

- Any waste defined as “oilfield waste”;
- Biomedical waste that is not rendered inert;
- Radioactive waste;
- Combustible waste;
- Explosives; and
- Bulk liquids.

1. The Foreman reserves the right to determine if a waste is acceptable at the landfill for storage or disposal. The prohibited waste may include soils or materials containing non-hazardous materials, such as those containing high concentrations of chlorides or other such constituents.

**RESPONSIBILITIES:**

1. The Landfill Foreman shall be responsible to inspect loads for prohibited debris and to take necessary actions to prevent such waste from entering the landfill site.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

		Policy No.
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Wash Up Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To establish appropriate hygiene for operations staff at the landfill.

**POLICY:**

Hands **MUST BE** thoroughly washed before handling or consuming **ANY FOOD OR BEVERAGE**. Food and beverage is to be consumed only in the Building, another area designated by the Landfill Foreman, or **OFF-SITE**.

Hands **MUST BE** thoroughly washed before **SMOKING**.

Hands must be thoroughly washed **BEFORE LEAVING** the landfill site for any reason, except in the case of an emergency when the site must be quickly evacuated.

Exterior clothing worn while working around any hazardous wastes, **MUST BE** removed prior to leaving the site.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Vehicle Accident Response Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To establish appropriate response in the event of a vehicle accident at the landfill site.

**POLICIES:**

All vehicle accidents should be reported and an investigation into the cause of the accident should be carried out. In the event of a vehicle accident, the following actions should be taken:

1. Alert the Landfill Foreman of the accident.
2. If the damage to the vehicle(s) is minor, the Landfill Foreman may instruct the individual(s) involved in the accident to report to the RCMP station.
3. If the damage is major, the Landfill Foreman is to call the RCMP.
4. Secure the site for safety and for follow-up investigation.
5. Traffic is to be directed around the scene of the accident.
6. If the vehicle accident results in any injuries, the injured person(s) should be provided with any assistance required as set out in the Medical Emergencies Response Policy.
7. Assist the RCMP with any investigation that is undertaken.
8. Complete the Incident Accident Form.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Treated Wood Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To outline acceptance and handling of treated lumber.

**POLICY:**

1. Treated lumber generally includes
  - Used railway ties;
  - Used power and telephone poles; or
  - Used fence posts.
2. Acceptance of treated lumber is to be done in accordance with the contaminated solid acceptance procedures outlined in the operations procedures manual.
3. Only non-processed (or whole units that have not been cut, shredded, or chipped) will be accepted for disposal.
4. Commercial volumes of treated lumber will not be accepted for disposal, whereby a commercial volume is more than five rail ties or five fence posts, and no more than one power pole or telephone pole.
5. Treated wood is not to be deliberately burned.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Spill Contingency Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To establish appropriate procedures to follow in the event of a spill that occurs on the landfill site including the active operations area, storage areas, compost facility, or in buildings or parking areas. This Spill Contingency Policy shall be reviewed annually and revised as necessary to reflect changes in regulations, operations, and technology. Any proposed revisions shall be submitted to the NWB for approval.

**POLICY:**

1. Immediately close off and isolate (with a barricade if appropriate) the area of the spill to the public and site employees who are not directly involved in the clean-up of the spill.
2. Identify, if possible, the material involved in the spill. If the material cannot be clearly identified, take note of the nature of the material (i.e. liquid or solid, colour, odour, original container, approximate amount, presence of vapours or fumes, or any other distinguishing features).
3. Direct traffic away from the spill area.
4. The Landfill Foreman shall coordinate the clean-up of the spill.
5. Control the source of the spill first then work on containing the spill using earth berms or other appropriate means.
6. For large spills, berm drainage ditches in the vicinity of the spill to prevent release of the material off-site.
7. Recover the spilled material and contaminated soils and deposit into an appropriate container for proper disposal. **DO NOT HANDLE CHEMICALS.**
8. Conduct personal decontamination if a chemical is spilled upon a person:
  - Remove and dispose of contaminated outer coveralls or personal clothing;
  - Utilize emergency eye wash and shower station if required;
  - Re-dress in cloth coveralls or a change of clothes that is kept on hand; and
  - If contaminated clothing cannot be washed safely, discard it.
9. If uncomfortable or hazardous fumes, bioinfectious, or radioactive materials are involved, follow evacuation procedures immediately and call Department of Public Works at (867)979-5653. Explain to the emergency operator the situation, identify the material (if possible) and provide as much information about the substance as possible such as liquid, solid, colour, quantity, or odours, and the location of the material on the site.
10. If outside fuel or oil storage tanks leak, contact a vacuum truck operator to vacuum up the free liquid product and use a spill kit to clean up any residue. Oil or fuel soaked soil should be excavated and properly handled through the biodegradation facility or other proper disposal.
11. Contact the Environmental Protection Division of the Department Environment, NU at (867) 975-7700.

**RESPONSIBILITIES:**

1. The Director of Public Works shall be responsible for the review and update of this policy.
2. The Landfill Foreman shall be responsible for carrying out spill containment in the active landfill operating area.
3. The Superintendent shall be responsible for advising Environmental Protection Division, as necessary.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQUALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Ozone Depleting Substances Management Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To prevent the uncontrolled release of Ozone Depleting Substances from appliances and equipment stored at the landfill.

**POLICY:**

1. In this policy, the term “units” applies to all household and commercial appliances and equipment that may contain Ozone Depleting Substances (i.e. CFC’s) and may include refrigerators, freezers, and air conditioning equipment, and may also include automobile air conditioners.
2. All units will be inspected prior to acceptance for storage or disposal at the landfill, and only those units that are tagged by a qualified technician indicating that the CFC’s have been purged, may be accepted for storage and recycling.
3. Units that are NOT tagged by a qualified technician indicating that the ozone depleting substances are not purged, the site supervisor may:
  - a) Refer the customer to a qualified technician for purging of the ozone depleting substance and tagging of the unit; or
  - b) May accept the unit for storage and assess a tipping fee in accordance with the rate set out by the Superintendent for all untagged units accepted for storage at the landfill.
4. All untagged units accepted for storage at the landfill will be stored in an area separate from tagged units and will not be crushed, recycled, or disposed until they are inspected and purged by a qualified technician in accordance with the Ozone Depleting Substances Regulations and appropriately tagged.
5. Units that have been improperly deposited at the working face or at other locations at the landfill will be separated and inspected for appropriate tags and moved and stored in the appropriate area. In all cases where an untagged unit is identified, attempts will be made to identify the customer and if identified, the appropriate fee will be assessed.

**RESPONSIBILITIES:**

1. The Landfill Foreman will be responsible for inspecting all units delivered to the site.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Litter Control Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To define litter control methods and responsibilities.

**POLICY:**

In summary, the following litter control methods are to be followed:

- All delivered loads should be secured;
- Compact waste as soon as practical after being deposited;
- Position wind catchment fences according to the location and configuration of the working face and wind direction;
- Retrieve litter as soon as practical following high wind events;
- Collect litter twice a year, once in the spring and once in the fall, as required in the Water Licence;
- Immediately clean up and, if safe to do so, dispose of in the landfill waste dumped illegally at the entrance gates or along access roads; and
- Regularly check ditches along adjacent roads and site access roads and pick up and dispose of spilled or blown litter as required.

**RESPONSIBILITIES:**

1. The Landfill Foreman is responsible for controlling and litter retrieval of litter escaping from the working face and cleanup of litter on the north side along roads.
2. The Landfill Foreman is responsible for litter control and cleanup of litter in the recycling compounds.
3. The Foreman is responsible for inspecting the landfill to monitor litter control and cleanup.
4. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Last Man Out Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To maintain site control and the safety of site employees, customers, and visitors.

**POLICY:**

1. At the end of the day closure of the landfill, a “last man out” procedure shall be followed. The Landfill Foreman shall:
  - a. Remain at the site until all other employees, customers, and site visitors have left;
  - b. Close and lock the entrance gates;
  - c. Complete a complete drive through of the recycling compounds, working face, composting area, inert disposal area, and equipment area;
  - d. Check all buildings to make sure no one remains inside and to make sure all doors and windows are closed and locked; and
  - e. Check the working face and inert disposal area to make sure the area is secure and that no fires or other issues are present.
2. The Landfill Foreman shall check the visitor registry to make sure all visitors have signed out.
3. Every effort will be made to make sure that no unauthorized vehicles or individuals remain at the site after it is closed for the day.

**RESPONSIBILITIES:**

1. The Landfill Foreman will be responsible to carry out this policy.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Key Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To maintain control of key distribution for the City of Iqaluit Municipal Landfill

**POLICY:**

1. Keys for access to the landfill will be distributed to:
  - The Landfill Foreman, and
  - The Superintendent.

**RESPONSIBILITIES:**

1. The Superintendent will be responsible for controlling distribution and use of keys.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Environmental Policy	<b>Page:</b> 1 of 1

**PURPOSE:**

To apply “best management” practices with regards to environmental protection.

**POLICY:**

1. The Director of Public Works will manage the landfill using due diligence towards development and operations of the landfill in accordance with regulatory requirements and best management principles.
2. Utilities and Environment employees and Contractors will endeavour to work according to the operating principles as set out in this policy.
3. “Due diligence” is defined as “the taking of all reasonable steps as part of the due care and attention to prevent the occurrence of an accident or mishap, as well as having a contingency plan to control an incident and limit any consequential damage”. This includes: policy development, checking and corrective action, and management review.
4. Best management practices include:
  - a. Good housekeeping;
  - b. Preventative maintenance;
  - c. Inspections and record keeping;
  - d. Security;
  - e. Employee hiring and training;
  - f. Reporting of incidents;
  - g. Operations procedures;
  - h. Emergency response planning;
  - i. Identification and assessment of risks; and
  - j. Review and corrective action.

**RESPONSIBILITIES:**

1. The Superintendent will be responsible to conduct, or arrange for, routine inspections of the landfill, operating procedures, and records in regards to this policy
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

		Policy No.
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Empty Container Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To provide direction to the Landfill Foreman for acceptance and management of empty containers.

**POLICY:**

1. Empty containers include:
  - a. 45 gal drums;
  - b. Grease and oil containers; and
  - c. Other industrial containers.
2. Empty containers will only be accepted if:
  - a. The top of the container has been removed; and
  - b. The container has not been sealed.
3. Containers will not be accepted that:
  - a. Are closed and sealed; and
  - b. The container holds any liquids.
4. The waste generator or hauler must provide a description of the previous contents of the container and identify if the container has been properly rinsed in accordance with the Guidelines. The Landfill Foreman may refuse acceptance of any container if the previous contents are not known or if the container has not been properly cleaned.
5. Empty containers that are recyclable will be stored in appropriate storage areas.
6. Empty containers that are not recyclable may be disposed in the landfill.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Fire Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To set out emergency procedures for responding to a fire.

**POLICY:**

1. Upon discovery of fire at the landfill, the Landfill Foreman shall call:
  - The Fire Department at (867) 979-4422 immediately to report the fire, its location, and the materials that are burning.
  - The Landfill Foreman shall call the Superintendent immediately.
  - Contact adjacent property owners, particularly if it appears the fire will go off-site.
2. Remove all operating and non-operating persons to a safe location. All non-operating persons shall be escorted to the gates, and the entrance gates are to be closed.
3. Maintain access to the site for Emergency Vehicles throughout the duration of the emergency.
4. Clear the Fire area of all persons, vehicles, and equipment with due consideration to safety.
5. For small fires (i.e. little or no flame present and capable of being extinguished by a portable fire extinguisher), if safe to do so, isolate the burning material from other waste, then extinguish or otherwise contain the fire to one area.
6. If the fire is isolated from other wastes, the fire may be extinguished by either covering it with sand or other soils, or by dousing it with water and covering it with soils.
7. If safe to do so, move flammable materials and wastes away from the fire **OR** cover these materials with sand or other soils to minimize the potential for the fire to spread to these materials.
8. **Do not bury any fire into the working face under any circumstances.**
9. Upon arrival of emergency response vehicles (Fire Truck, Ambulance) the senior staff members, e.g. Landfill Foreman, on-site shall identify themselves to the Emergency Commander and offer full assistance as requested. Once the Fire Department arrives, the Fire Commander in is full control and landfill staff takes instructions from the Fire Commander.
10. The landfill operating staff are to remain at the site unless otherwise evacuated or released by the Fire Commander.
11. Following a fire, an incident report is to be completed and an investigation into the cause of the fire is to be conducted by the Solid Waste Manager.
12. Once the fire is extinguished and it is safe to do so, the waste and debris is to be cleaned up and the site operations returned to normal conditions.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Safe Work Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To protect employees from flying debris, dust, heat, noise, traffic, and other potential hazards.

**POLICY:**

1. Employees are to be aware of safe work practices and must know how and when to use personal protective equipment.
2. Employees working at the landfill shall wear appropriate personal protective equipment for specific duties undertaken and in accordance with specific circumstances such as windy conditions, high dust conditions, or other situations that may arise.
3. Personal Protective Equipment to be worn by employees in accordance with the above includes:
  - a. Steel toed safety boots (for all field duties);
  - b. Safety vest (in the field when out of vehicles or landfill equipment);
  - g. Hard hat (where appropriate to specific duties);
  - h. Eye protection (in high wind or dusty conditions);
  - i. Ear protection (when operating or working around equipment);
  - j. Long pants and shirts (for all field duties); and
  - k. Hat (in hot weather).
4. In the event of dirt or dust in eyes, the eye wash station at the scale house is to be used with assistance from the Landfill Foreman, if required. **If there is any doubt about debris in the eyes (i.e. metals, glass, or other materials) immediately see a Doctor.**
5. All near misses and accidents must be reported and documented on the Accident and Incident Report Form.

**RESPONSIBILITIES:**

1. All employees must take responsibility for their own safety and the safety of other employees, customers, and visiting public.
2. The Landfill Foreman shall provide input into the Policy and is responsible for enforcing the Policy.
3. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Random Load Checking Program Policy	<b>Page:</b> 1 of 2

**PURPOSE:**

1. To randomly inspect loads of waste being disposed at the landfill;
2. To detect hazardous or other prohibited waste material and avoid their disposal in the landfill; and
3. To identify potentially recyclable material which could be diverted from the landfill in the future.

**POLICY:**

1. Randomly select a load for inspection and ask the driver to stop in a designated area.
2. Record the following information on a Waste Inspection Form prior to allowing the driver to dump the load (see Waste Inspection Form):
  - Name of hauler;
  - Name of waste generator;
  - Type of waste;
  - License plate number;
  - Truck number;
  - Name of the driver; and
  - Signature of the driver.
3. Ask the driver to dump the load in the designated area. The driver is not required to stay on-site while the load is being inspected.
4. Spread out the waste, using a rake or front-end loader if required.
5. Record any potentially recyclable materials.
6. Inspect the load for hazardous or prohibited waste materials. If such materials are found, then do the following:
  - Isolate the waste and contact the Landfill Foreman if the waste material poses an immediate risk to human health or the environment;
  - Record the information on the Waste Inspection Form;
  - Take photographs of the material;
  - Attempt to confirm information on the generator of the waste;
  - Contact the hauler or generator of the waste material and require them to remove the material from the Landfill Facility;
  - If the waste materials are considered hazardous, contact the Environmental Protection Division Department of Environment at (867) 975-7700.
7. Complete and sign the Waste Inspection Form.
8. Send a letter to the generators of the recyclable materials advising that the material could be recycled in the future.



**CITY OF CITY OF IQALUIT**

	<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill	<b>Effective Date:</b>
<b>Policy:</b> Random Load Checking Program Policy	<b>Page:</b> 2 of 2

**RESPONSIBILITIES:**

Record Keeping

1. A Waste Inspection Form will be completed for each load inspected and will be kept on file at the landfill and administrative offices.
2. If hazardous waste materials are identified, the Waste Inspection Form and a summary of the action taken will be forwarded to NWB, and the Environmental Protection Division Department of Environment.
3. Photographs of hazardous waste materials will be filed with the appropriate Waste Inspection Form.

Safety Considerations

1. The Waste Inspector will wear the following safety clothing during inspections:
  - Coveralls;
  - Safety boots;
  - Gloves;
  - Safety vest;
  - Face mask as required; and
  - Eye protection.

Inspection Frequency

1. One in every 300 loads, a minimum of two loads per month will be inspected.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:



**CITY OF CITY OF IQALUIT**

		<b>Policy No.</b>
<b>Facility:</b> City of Iqaluit Municipal Landfill		<b>Effective Date:</b>
<b>Policy:</b> Propane Bottle Policy		<b>Page:</b> 1 of 1

**PURPOSE:**

To provide guidance for the acceptance and handling of propane bottles.


**POLICY:**

1. Propane bottles will not be accepted at the landfill unless the container has been purged or emptied of its contents and the operating valve is in an open position, or if it has been removed from the bottle.
2. If the operating valve is closed, the propane bottle will not be accepted.
3. Empty propane bottles will be stored in the designated propane bottle storage area.
4. Propane bottles will not be offered, given, or sold to any person for use, unless that person is qualified to refurbish and certify the propane bottle.
5. All valves will be removed from propane bottles for recycling.
6. Empty propane bottles with removed valves will be recycled through scrap metal dealers if possible, but will otherwise be disposed in the landfill.

**RESPONSIBILITIES:**

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

	<b>Health and Safety Program</b>		<b>HSP</b>
	<b>Title</b>		
	Approved By:	CAO	
	Date Approved:	3 Nov 2011	
	Date JWHSC Approved:	15 Nov 2011	
Revision Date:		Annual Review	

## 1. Purpose

1.1. The purpose of this program is to prevent injury/harm to all workers and citizens of the City of Iqaluit by implementing proactive inspections, hazard identification, accident investigations and a Joint Work Site Health & Safety Committee. It will also aid in reducing the accidental damage to equipment and materials used in the daily operation of our City. The goal of this program is to meet or exceed governmental legislation, recognized industry standards and work practices while working to serve the citizens of Iqaluit.


## 2. Scope

2.1. This program pertains to all workers of the City of Iqaluit, including visitors, contractors and sub-contractors.

## 3. Procedures

3.1. This program will be developed by management in conjunction with the Joint Work Site Health and Safety Committee, to meet the City of Iqaluit's Health and Safety Policy. There will be 13 main programs established to meet the Nunavut Safety Act and Regulations. These programs are:

- 3.1.1. Health and Safety Program - HSP
- 3.1.2. Health and Safety Orientation - HSO
- 3.1.3. Health and Safety Education & Training - HSET
- 3.1.4. Joint Work Site Health and Safety Committee - JWHSC
- 3.1.5. Workplace Inspections - WI
- 3.1.6. Accident Investigations - AI
- 3.1.7. Emergency Response Plan - ERP
- 3.1.8. Personal Protective Equipment - PPE
- 3.1.9. Prevention Maintenance Program – PMP
- 3.1.10. Safe Work Practices – SWP
- 3.1.11. High Risk Tasks - HRT
- 3.1.12. Health and Safety Program Audit – HSPA
- 3.1.13. Return to Work Program - RTW

	<b>Health and Safety Program</b>		<b>HSP</b>
	<b>Title</b>		
	Approved By:	CAO	
	Date Approved:	3 Nov 2011	
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3.2. To support these programs Safe Work Practices SWP will be developed by management again with consultation by the Joint Work Site Health and Safety Committee to define task specific responsibilities by department.

## **4. Roles & Responsibilities**

### **4.1. CAO**

- 4.1.1. Establish the City of Iqaluit Health and Safety Policy
- 4.1.2. Support all Programs established by departments

### **4.2. Directors**


- 4.2.1. Ensure compliance with approved Prevention Programs
- 4.2.2. Monitor compliance through regular inspections of the workplace
- 4.2.3. Conduct requirements of Section 4.3 should there be no direct Manager/Supervisor in the Department
- 4.2.4. Discipline infractions of non-compliance

### **4.3. Managers/Supervisors**

- 4.3.1. Know all Prevention Programs
- 4.3.2. Comply with all Prevention Program requirements
- 4.3.3. Train employees on the Prevention Programs
- 4.3.4. Develop SWP's to support the Program
- 4.3.5. Inspect the workplace monthly
- 4.3.6. Conduct a Job Hazard Analyses to control hazards
- 4.3.7. Discipline infractions of non-compliance
- 4.3.8. Recommend changes to the Programs

### **4.4. Workers**

- 4.4.1. Participate in the Prevention Programs
- 4.4.2. Identify hazards to managers/supervisors
- 4.4.3. Work in accordance with legislative and city requirements
- 4.4.4. Recommend changes to the Programs

	<b>Health and Safety Program</b>		<b>HSP</b>
	<b>Title</b>		
	Approved By:	CAO	
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#### **4.5. JWHSC**

- 4.5.1. Review the Prevention Programs annually
- 4.5.2. Monitor effectiveness of Programs through inspections
- 4.5.3. Identify areas of improvement
- 4.5.4. Recommend changes to the Programs

#### **4.6. Health & Safety Officer**


- 4.6.1. Audit the Prevention Programs
- 4.6.2. Provide assistance developing SWP's
- 4.6.3. Provide assistance developing Job Hazard Analysis
- 4.6.4. Monitor legislative and industry standards to improve Programs

### **5. Communication**

- 5.1. Directors shall communicate with Managers/Supervisor changes required to the Program.
- 5.2. Managers/Supervisors shall communicate changes of the Program to workers.
- 5.3. Workers shall communicate with Managers/Supervisors any required changes to the Program.

### **6. Training**

- 6.1. All workers shall receive a City of Iqaluit Employee Orientation within the first 2 weeks of employment with the City of Iqaluit outlining Program areas.
- 6.2. All workers shall receive Departmental Orientation on work place specific Programs upon hire.
- 6.3. All workers shall receive training whenever new procedures/equipment has been introduced into the department.
- 6.4. All contractors and sub-contractors shall receive training on City of Iqaluit Programs as required.

	<b>Health and Safety Program</b>		<b>HSP</b>
	<b>Title</b>		
	Approved By:	CAO	
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## 7. Evaluation

### 7.1. Annually

- 7.1.1. Directors
- 7.1.2. Managers/Supervisors
- 7.1.3. JWHSC

### 7.2. Quarterly


- 7.2.1. Health and Safety Officer

## 8. Forms

- 8.1. As required throughout the City of Iqaluit Program.

## 9. Reference Material

- 9.1. Nunavut Safety Regulation Section 7


	<b>Accident Investigation Program</b>		AIP
	Title		
	Approved By:	CAO	
	Date Approved:	23 January 2012	
	Date JWHSC Approved:		
Revision Date:		Review 3 Years	

## 1. Purpose

- 1.1. To meet legislative requirements of the Territory of Nunavut to report deaths, incidents and injuries within specified periods to the Chief Safety Officer of the WSCC.
- 1.2. To ensure that all incidents, injuries, near misses are reported, investigated and corrective action is taken to prevent the situation from occurring again.


## 2. Scope

- 2.1. The following incidents/injuries shall be investigated immediately by Directors/Managers/Supervisors upon notification by a worker.
  - 2.1.1. Death
  - 2.1.2. Incident of a Serious Nature
    - 2.1.2.1. A major structural failure or collapse of a building, bridge, tower, crane, structure, scaffold, temporary construction support system or excavation;
    - 2.1.2.2. An uncontrolled spill or escape of a toxic or hazardous substance;
    - 2.1.2.3. An accidental contact with an energized electrical conductor;
    - 2.1.2.4. A premature or accidental detonation of explosives;
    - 2.1.2.5. A concussion, major blood loss, serious fracture, unconsciousness or amputation; and
    - 2.1.2.6. An incident involving heavy equipment.
  - 2.1.3. Incident Involving Non-Serious Injury
    - 2.1.3.1. A work related injury where Medical Treatment or First Aid is required.
  - 2.1.4. Incident with No Injury
    - 2.1.4.1. An undesired event that under different circumstances could have resulted in an accident with injury, property damage, or loss of productivity.

	<b>Accident Investigation Program</b>		AIP
	Title		
	Approved By:	CAO	
	Date Approved:	23 January 2012	
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### 3. Procedures

- 3.1. The following course of events is not implied to be sequential however are very important to ensure the integrity of the accident scene investigation.
- 3.2. **Death** – The goal of our Health and Safety Program is to avoid this circumstance at all cost. An accident causing death is a traumatic event for the worker witnessing it. First Aid and or Medical Treatment are always the first priority for the injured worker. Legal obligations after the injury may apply and therefore it is important to notify the supervisor of the accident.
- 3.3. Notify your supervisor. The supervisor shall then ensure all responsibilities listed in Parts 3.3.1 through 3.3.7 are completed.
- 3.3.1. Immediately inform the WSCC Chief Safety Officer.
- 3.3.2. An accident involving a motor vehicle shall be reported to the RCMP.
- 3.3.3. Secure the scene of the incident.
- 3.3.3.1. Avoid compromising the integrity of scene. This may be accomplished with barrier tape, posting workers around the scene to prevent entrance or other means necessary.
- 3.3.3.2. Identify potential witnesses and separate them if possible.
- 3.3.3.3. Contact Emergency Services (ambulance/paramedics).
- 3.3.4. Contact the following City of Iqaluit employees:
- 3.3.4.1. Chief Administration Officer(all media communication shall be disseminated through the CAO) ;
- 3.3.4.2. Director of Human Resources (for notification of family);
- 3.3.4.3. City Health and Safety Officer (shall communicate with WSCC/RCMP/Municipal Enforcement);
- 3.3.4.4. Joint Worksite Health and Safety Committee member; and
- 3.3.4.5. Department Director.
- 3.3.5. Conduct an Accident Investigation with assistance from the City Health and Safety Officer and Joint Worksite Health and Safety Committee.

	<b>Accident Investigation Program</b>		AIP
	Title		
	Approved By:	CAO	
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3.3.6. Complete and submit within 3 days-WSCC Claim: Employer's Report of Fatal Injury Form.

3.3.7. Complete Accident Investigation Form AIPF-01

### **3.4. Incident Involving Serious Injury or Incident of a Serious Nature**

3.4.1. Notify your supervisor.

3.4.2. The supervisor shall then ensure all responsibilities listed in Parts 3.4.3 through 3.4.11 are completed.

3.4.3. Provide medical treatment to injured worker.

3.4.4. Provide or arrange transportation to a medical facility for an injured worker.

3.4.5. Within 24 hours submit written or oral report to the WSCC Chief Safety Officer.

3.4.6. Secure the scene of the incident.

3.4.6.1. Avoid compromising the integrity of scene. This may be accomplished with barrier tape, posting workers around the scene to prevent entrance or other means necessary.

3.4.6.2. Identify potential witnesses and separate them if possible.

3.4.6.3. Contact Emergency Services if required.

3.4.7. Contact the following City of Iqaluit employees:

3.4.7.1. Chief Administration Officer;


3.4.7.2. Director of Human Resources;

3.4.7.3. City Health and Safety Officer;

3.4.7.4. Joint Worksite Health and Safety Committee; and

3.4.7.5. Department Director.

3.4.8. Conduct an Accident Investigation with assistance from the City Health and Safety Officer.

	<b>Accident Investigation Program</b>		AIP
	Title		
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3.4.9. Complete and submit within 3 days WSCC Claim: Employer's Report of Injury Form.

3.4.10. Provide the Worker with a WSCC Claim: Workers Report of Injury Form.

3.4.11. Complete Accident Investigation Form AIPF-01.

### **3.5. Incident Involving Non-Serious Injury**

3.5.1. Notify your supervisor.

3.5.2. The supervisor shall then ensure all responsibilities listed in Parts 3.5.3 through 3.5.12 are completed.

3.5.3. Worker shall inform Supervisor immediately of the Injury or Incident.

3.5.4. Provide medical treatment to injured worker.

3.5.5. Provide or arrange transportation to a medical facility for an injured worker.

3.5.6. Secure the scene of the incident.

3.5.6.1. Avoid compromising the integrity of scene. This may be accomplished with barrier tape, posting workers around the scene to prevent entrance or other means necessary.

3.5.6.2. Identify potential witnesses and separate them if possible.

3.5.6.3. Contact Emergency Services if required.


3.5.7. Contact the following City of Iqaluit employees:

3.5.7.1. City Health and Safety Officer;

3.5.7.2. Joint Worksite Health and Safety Committee; and

3.5.7.3. Department Director.

3.5.8. Conduct an Accident Investigation with assistance from the City Health and Safety Officer.

	<b>Accident Investigation Program</b>		AIP
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	Approved By:	CAO	
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3.5.9. Complete and submit within 3 days WSCC Claim: Employer's Report of Injury Form.

3.5.10. Provide the Worker with a WSCC Claim: Workers Report of Injury Form.

3.5.11. Complete First Aid Record book with a First Aid Representative Signature.

3.5.12. Complete Accident Investigation Form AIPF-01 when Medical Treatment is required for the injury.

### **3.6. Incident with No Injury**

3.6.1. Notify your supervisor.

3.6.2. The supervisor shall then ensure all responsibilities listed in Parts 3.6.3 through 3.6.6 are completed.

3.6.3. Worker shall inform Supervisor immediately of the Incident.

3.6.4. Contact the following City of Iqaluit employees:

- 3.6.4.1. City Health and Safety Officer;
- 3.6.4.2. Joint Worksite Health and Safety Committee; and
- 3.6.4.3. Department Director.

3.6.5. Conduct an Accident Investigation with assistance from the City Health and Safety Officer.


3.6.6. Complete Accident Investigation Form AIPF-01 when Incidents are assigned an Incident Rating of 1, 2 or 3.

## **4. Roles & Responsibilities**

### **4.1. CAO**

4.1.1. Establish the City of Iqaluit Accident Investigation Program.

4.1.2. Review annually the Accident Investigation Program.

	<b>Accident Investigation Program</b>		<b>AIP</b>
	<b>Title</b>		
	Approved By:	CAO	
	Date Approved:	23 January 2012	
	Date JWHSC Approved:		
Revision Date:		Review 3 Years	

#### **4.2. Directors**

- 4.2.1. Ensure investigations are conducted according to the Program.
- 4.2.2. Ensure corrective measures are implemented to prevent the incident/injury occurring again.
- 4.2.3. Ensure the WSCC Incident Reporting Responsibilities is posted in the workplace for all workers.
- 4.2.4. Ensure Managers/Supervisors are trained in Accident Investigation.
- 4.2.5. Conduct requirements of Section 4.3 should there be no direct Manager/Supervisor in the Department.
- 4.2.6. Encourage worker participation in the Accident Investigation Program.

#### **4.3. Managers/Supervisors**


- 4.3.1. Investigate all incidents/injuries reported by the worker.
- 4.3.2. Provide corrective measures to prevent the incident/injury occurring again.
- 4.3.3. Instruct all workers the importance of reporting incidents/injuries.
- 4.3.4. Complete all required Forms.
- 4.3.5. Encourage worker participation in the Accident Investigation Program.

#### **4.4. Workers**

- 4.4.1. Know the City of Iqaluit Accident Investigation Program.
- 4.4.2. Report all incidents and injuries to the Manager/Supervisor immediately.
- 4.4.3. Participate in investigations.

#### **4.5. JWHSC**

- 4.5.1. Know the Accident Investigation Program.
- 4.5.2. Receive training on Accident Investigation (Co-chairs).
- 4.5.3. Participate in Accident Investigations.
- 4.5.4. Review all Accident Reports.

	<b>Accident Investigation Program</b>		AIP
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#### **4.6. Contractors/Visitors**

- 4.6.1. Know the City of Iqaluit Accident Investigation Program.
- 4.6.2. Report all incidents and injuries to the Department Manager/Supervisor.
- 4.6.3. Participate in investigations.

#### **4.7. Health and Safety Officer**

- 4.7.1. Develop the Accident Investigation Program.
- 4.7.2. Provide training on Accident Investigation.
- 4.7.3. Assist with Accident Investigations.
- 4.7.4. Review all Accident Reports.
- 4.7.5. Report to CAO and JWHSC incidents/injuries monthly.

#### **4.8. Training Development Officer**


- 4.8.1. Coordinate training requirements for Directors.

### **5. Communication**

- 5.1. The Accident Investigation Program shall be posted and available to all workers in the workplace.
- 5.2. All incidents/injuries shall be reported to the Health and Safety Officer.
- 5.3. Workers shall be informed of the Accident Investigation Program through the Orientation Program.
- 5.4. Workers shall report immediately any injury/incident to the Manager/Supervisor.

### **6. Training**

- 6.1. Accident Investigation Program Training through the Orientation Program.
  - 6.1.1. Directors
  - 6.1.2. Managers/Supervisors
  - 6.1.3. Workers
  - 6.1.4. Contractors
- 6.2. Accident Investigation.
  - 6.2.1. Directors

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- 6.2.2. Managers/Supervisors
- 6.2.3. JWHSC Co-chairs

6.3. Refresher Training

- 6.3.1. Every 3 years
- 6.3.2. Change in the Accident Investigation Program.

## 7. Evaluation

7.1. Annually


- 7.1.1. Health and Safety Officer
- 7.1.2. Joint Worksite Health and Safety Committee

## 8. Forms

- 8.1. Accident Investigation Program Form AIPF-01
- 8.2. First Aid Log Book
- 8.3. WSCC Claim Employer's Report of Fatal Injury form
- 8.4. WSCC Claim Employer's Report of Injury form
- 8.5. WSCC Claim Worker's Report of Injury form


## 9. Reference Material

- 9.1. Nunavut Safety Regulation Sections 35 & 65.

	<b>Accident Investigation Program Form AIPF-01</b>		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		
Revision Date:		Review 3 Years	


<b>INFORMATION</b>	<i>Department</i>		<i>File #</i>		<i>Report Date</i>				
	<i>Location</i>		<i>Date of Incident</i>		<i>Time</i>				
	<b>Injury</b>		<b>Damage</b>		<b>Near Miss</b>				
	Name		Property		Incident				
	Description of Injury		Damage Type		Cost				
	Occupation		Cost		Reported By				
	Job Experience		Estimated		Persons Involved				
			Actual		Supervisor				
	<b>Incident Type (check)</b>				<b>Contact (check)</b>				
	<input type="checkbox"/>	Struck Against	<input type="checkbox"/>	Caught On	<input type="checkbox"/>	Fall on Same Level	<input type="checkbox"/>	Electricity	<input type="checkbox"/>
<input type="checkbox"/>	Struck By	<input type="checkbox"/>	Caught Between	<input type="checkbox"/>	Fall to Lower Level	<input type="checkbox"/>	Heat	<input type="checkbox"/>	Noise
<input type="checkbox"/>	Caught In	<input type="checkbox"/>	Slip	<input type="checkbox"/>	Overexertion	<input type="checkbox"/>	Cold	<input type="checkbox"/>	Hazardous Substance
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	Radiation	<input type="checkbox"/>	

<b>RISK</b>	<b>Incident Rating</b>			
	<b>Severity</b>		<b>Probability</b>	
	1	<b>Catastrophic</b> – could cause death/major equipment loss	A	<b>Probable</b> -likely to occur soon (daily)
	2	<b>Critical</b> – could cause severe injuries/equipment damage/environmental damage (time lost from work)	B	<b>Reasonable Probable</b> -likely to occur eventually (monthly)
	3	<b>Marginal</b> - minor injury/moderate damage/small environment impact (no time lost other than day of injury)	C	<b>Remote</b> -occur at some point (quarterly)
	4	<b>Negligible</b> - first aid treatment	D	<b>Extremely Remote</b> - unlikely to occur again (annual)
This incident is rated as a (example-3D)				
<b>Any Incident Rating with a Severity Rating of 1, 2 or 3 must be investigated with the Health &amp; Safety Officer.</b>				


	<b>Accident Investigation Program Form AIPF-01</b>		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
Revision Date:		3 Years	

Description of Incident/Statement of Observer (use back of form if required)		
<b>Name</b>	<b>Signature</b>	<b>Date</b>


Description of Incident/Statement of Observer (use back of form if required)		
<b>Name</b>	<b>Signature</b>	<b>Date</b>

	<b>Accident Investigation Program Form AIPF-01</b>		<b>AIPF-01</b>
	<b>Title</b>		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		
Revision Date:		Review 3 Years	

<b>INCIDENT CAUSES</b>	<b><i>Substandard Act (check all that apply)</i></b>			
	Operating Equipment without Authority		Using Defective Equipment	Improper Lifting
	Failure to Warn		Improper Use of Equipment	Improper Position for Task
	Failure to Secure		Failure to use PPE	Servicing Equipment in Operation
	Operating at Improper Speed		Improper Loading	Horseplay
	Inoperable/Not using Safety Devices		Improper Placement	Under Influence Alcohol/Drugs
	<b><i>Substandard Condition (check all that apply)</i></b>			
	Operating Equipment without Authority		Inadequate Warning	Noise
	Improper Protective Equipment		Fire & Explosion Hazard	Radiation
	Defective Tools/Equip/Materials		Housekeeping	Temperature
	Congestion		Hazardous Environment	Lighting
				Ventilation
	<b><i>Basic Causes (check all that apply)</i></b>			
	<b><i>Personal Factors</i></b>			<b><i>Job Factors</i></b>
	Experience		Stress	Supervision/ Leadership
	Knowledge		Motivation	Engineering
	Training		Skill	Purchasing
				Maintenance
				Tools/Equipment
				Work Standards
			Wear and Tear	
			Abuse and Misuse	

	<b>Accident Investigation Program Form AIPF-01</b>		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
Revision Date:		3 Years	

ANALYSIS OF CAUSES	<i>Expand on Incident Causes Identified on Page 3</i>

	<b>Accident Investigation Program Form AIPF-01</b>		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
Revision Date:		3 Years	

CORRECTIVE ACTIONS	<i>What must be done to prevent occurring again?</i>	<i>Deadline</i>	<i>Whom</i>	<i>Completed</i>	
		<b>Investigators Signature</b>	<b>Date</b>		

REVIEW	<i>Health &amp; Safety Officer</i>		
	<b>Signature</b>	<b>Date</b>	

# Appendix **B**

## Forms





Canada

# 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	<input type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER
	B	OCCURRENCE DATE: MONTH - DAY - YEAR		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION <input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE	LONGITUDE		
	DEGREES   MINUTES   SECONDS	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	

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER
		STATION OPERATOR		YELLOWKNIFE, NT	(867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS		
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

<b>Step 1: Fire Hazard Assessment Checklist</b>			
Facility: _____			Date: _____, _____
Priority for Corrective Action    # 1 high risk #2 moderate risk #3 low risk #4 no risk #5 not applicable			
Item	Identified Hazard	Status (Priority)	Safety Hazard and Location
<b>Fire Safety</b>			
1	Employee training		
2	Employee knowledge		
3	On-site communications		
4	Off-site communications		
5	Water supply		
6	Site security		
7	Fire safety plan		
8	Fire drills		
<b>Storage of Materials</b>			
1	Compressed Gases		
2	Aerosols		
3	Dangerous goods		
5	6 m clearance of stored materials. From uncontrolled grass or weeds		
6	Fire Dept. access		
7	Fencing/Security		
8	Access to water		
9	Lumber storage		
10	Wood chips, hogged materials.		
11	Used Tire Storage		
12	Compressed gases		
13	Fire Dept. Access		
14	Fire breaks		

<b>Step 2: Fire Safety Hazard Assessment Corrective Action</b>				
Facility:			Date	
Assessment Team			Persons	Position
Item	Priority	Recommended Action	Follow-up	
			Action taken Date/Time	By whom?
Superintendent Signature:			Date:	

<b>Step #3 Health and Safety Hazard Assessment Checklist</b>			
Facility		Date/Time:	
Priority Status		#1 very hazardous, previous accident of high potential #2 hazardous with moderate risk #3 low risk #4 O.K. #5 not applicable (N/A)	
Item #	Identified Hazards	Status/Priority	Safety Hazard and Location
1	Housekeeping		
2	Material Storage		
3	Waste disposal		
4	Lighting		
5	Ventilation		
6	Extreme Temperature		
7	Radiation exposure		
8	Gas (toxic or non-life supporting)		
9	Flammables (Fire/Explosion)		
10	Dangerous Pressure		
11	Chemicals		
12	Hazardous Materials (WHMIS)		
13	High Risk Positioning		
14	Electrical Hazards		
15	Overhead Hazards		
16	Underground Hazards		
17	Confined Space Entry		
18	Excavations		
19	Restricted Access/Egress		



<b>Step #3 Health and Safety Hazard Assessment Checklist</b>			
Facility		Date/Time:	
Priority Status		#1 very hazardous, previous accident of high potential #2 hazardous with moderate risk #3 low risk #4 O.K. #5 not applicable (N/A)	
Item #	Identified Hazards	Status/Priority	Safety Hazard and Location
20	Ladders		
21	Work at Heights		
23	Work over water		
24	Major lifts (hoisting)		
25	Vehicles		
26	Mobile equipment		
27	High traffic		
28	Power tools		
29	Permits		
30	Communications		
31	First Aid		
32	Personal Protection Equipment		
33	Other items		
Superintendent Signature:			Date:

**CITY OF CITY OF IQALUIT  
CITY OF IQALUIT MUNICIPAL LANDFILL  
ACCIDENT/NEAR MISS REPORT**

Incident Date: \_\_\_\_\_ Time: \_\_\_\_\_

Location:  
\_\_\_\_\_  
\_\_\_\_\_

Name and Position of Person Making Report \_\_\_\_\_

Name of individual(s) involved:  
\_\_\_\_\_  
\_\_\_\_\_

Drivers License No.(s) if required \_\_\_\_\_

Individual or Company \_\_\_\_\_ Phone No. \_\_\_\_\_

Did the Incident Result in Personal Injury? Yes \_\_\_\_\_ No \_\_\_\_\_

Injury report attached Yes \_\_\_\_\_ No \_\_\_\_\_  
(i.e. Worker's Safety and Compensation Commission form or other applicable form)

Did the incident cause damage to Landfill or other property? Yes \_\_\_\_\_ No \_\_\_\_\_

Who investigated the Incident?

Supervisor \_\_\_\_\_ RCMP \_\_\_\_\_ Special Committee \_\_\_\_\_ HS&S \_\_\_\_\_

Contact Person(s) \_\_\_\_\_

**Details of Equipment/Property Damage if Applicable**

Damage was to: Vehicle      Equipment      Property

Description:

Unit No.	Year	Make	Model
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Estimated Value of Vehicle/Equipment/Property \_\_\_\_\_

Estimated Damage to Vehicle/Equipment/Property \_\_\_\_\_

Description of Incident (use attachment if necessary)

Incident Cause (use attachment if necessary)

Sketch of Incident Where Applicable (use attachment if necessary)

Recommendation to Prevent Re-occurrence (use attachment if necessary)

Comments (use attachment if necessary)

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Report Date \_\_\_\_\_

Distribution List:



**CITY OF CITY OF IQALUIT  
 CITY OF IQALUIT MUNICIPAL LANDFILL  
 RANDOM LOAD VISUAL INSPECTION REPORT**

Date: \_\_\_\_\_ Time \_\_\_\_\_ a.m. /p.m. Inspection Conducted by \_\_\_\_\_  
 Hauler \_\_\_\_\_ Vehicle Operator \_\_\_\_\_  
 Vehicle Description \_\_\_\_\_ Source of the Waste \_\_\_\_\_  
 General Description of the Waste \_\_\_\_\_

Composition	Estimated Percent of Total Volume	Actions or Follow-up Taken
Food Waste		
Cardboard		
Paper Products		
Plastics		
Textiles/Rubber/Leather		
Metals		
Ceramics/Bricks		
Dirt and rocks		
Ashes		
Yard wastes		
Wood wastes		
Glass		
Tires		
Drywall		
Oils or greases		
Glycol		
Paints/Solvents		
Pesticides		
Cleaning Products		
Ozone Depleting Substances		
Electrical Equipment		
Radio-Active Materials		
Other (NOTE TYPE)		

**CITY OF IQALUIT  
CITY OF IQALUIT MUNICIPAL LANDFILL  
VISITOR LOG**

Date	Name	Representing	Time In	Time Out	Signature	Reason for Visit



**CITY OF IQALUIT  
 CITY OF IQALUIT MUNICIPAL LANDFILL  
 MONTHLY SITE OPERATIONS INSPECTION**

**Date:** \_\_\_\_\_ **Inspector:** \_\_\_\_\_

**A: Acceptable, U: Unacceptable**

No	Item	A	U	COMMENTS
----	------	---	---	----------

**1.0 PERMITS AND APPROVALS**

1.1	Municipal Development Permit			
1.2	Land Titles, Lease Agreements			
1.3	SAHTU Land and Water Board Approvals			
1.4	Other			

**2.0 RECORDS**

2.1	Survey and Site Plans			
2.2	Waste Volumes			
2.3	Special Waste Records			
2.4	Daily Operating Logs			
2.5	Monitoring Reports			

**3.0 PERSONNEL TRAINING AND CERTIFICATION**

3.1	Landfill Foreman			
3.2	First Aid			
3.3	Work Place Safety (OH&S)			
3.4	WHMIS			
3.5	Other			

**4.0 DESIGN AND OPERATIONS AND MAINTENANCE PLAN**

4.1	Site Development Plan current			
4.2	Operations Procedures & Policies Current			
4.3	Construction/As-built records			

**5.0 PERSONNEL, OPERATING EQUIPMENT AND FACILITIES**

5.1	Landfill Foreman			
5.2	Support Personnel			
5.3	Staff Facilities			
5.4	Equipment Facilities			
5.5	Communication equipment			
5.6	Fuel Storage			

No	Item	A	U	COMMENTS
----	------	---	---	----------

**6.0 ENTRANCE AND ROADWAYS**

6.1	Site Appearance			
6.2	Entrance Road			
6.3	On-site Access Roads			
6.4	Road Surfacing			

**7.0 SITE DEVELOPMENT**

7.1	Construction			
7.2	Cover Soils			
7.3	Borrow Areas			
7.4	Topsoil/Subsoil Salvaged/Stockpiled			

**8.0 ACTIVE WORKING FACE**

8.1	Vehicle Staging/Safety			
8.2	Working Face			
8.3	Waste Compaction Density			
8.4	Cover Frequency			
8.5	Surface Water Controls			
8.6	Litter Controls			
8.7	Other			

**9.0 INACTIVE SLOPES**

9.1	Intermediate Cover (300 mm)			
9.2	Vegetation Cover			
9.3	Drainage and Grading			
9.4	Erosion Controls			

**10.0 COMPLETED AREAS**

10.1	1000 mm Compacted Shale Layer			
10.2	150 mm Topsoil Layer			

**11.0 SURFACE WATER MANAGEMENT**

11.1	Working face controls			
------	-----------------------	--	--	--

No	Item	A	U	COMMENTS
----	------	---	---	----------

**12.0 ENVIRONMENTAL MONITORING AND CONTROLS**

12.1	Groundwater Monitoring Annual Report on file Wells protected and secure			
12.2	Litter Management			
12.3	Animal Management			
12.4	Dust Management			

**13.0 CONTROLLED BURNING AREA**

13.1	Materials accepted			
13.2	Site maintenance			
13.3	Burning controls			
13.4	Notification to Department of Environment and Natural Resources Northwest Territories, Neighbours, Fire Dept.			

**14.0 RECYCLING FACILITIES**

14.1	Tires			
14.2	Metals			
14.3	Appliances			
14.4	Batteries			
14.5	Plastics			

**15.0 SAFETY**

15.1	Employee Safety Practices/Issues			
15.2	Customer Safety Practices/Issues			
15.3	Equipment Backup Alarms			
15.4	Documentation			

**16.0 EMERGENCY RESPONSE**

16.1	Medical Emergency Response			
16.2	Fire Response			
16.3	Environmental Response			



**CITY OF IQALUIT  
 CITY OF IQALUIT MUNICIPAL LANDFILL  
 DAILY OPERATIONS LOG**

**DATE:** Day \_\_\_\_\_ Month \_\_\_\_\_ Year \_\_\_\_\_

**WEATHER:** Precipitation \_\_\_\_\_ mm Temp. \_\_\_\_\_ °C Wind : \_\_\_\_\_ km from \_\_\_\_\_

**DAILY WASTE RECORD:**

Received (in-bound) \_\_\_\_\_ m3  
 Recycled (out-bound) \_\_\_\_\_ m3  
 Compost Materials \_\_\_\_\_ m3  
 Clean Wood Materials \_\_\_\_\_ m3

**STAFF:**

Landfill Foreman Start: \_\_\_\_\_ Leave: \_\_\_\_\_

**EQUIPMENT:**

Compactor Hours: \_\_\_\_\_ Activity: \_\_\_\_\_  
 Hours: \_\_\_\_\_ Activity: \_\_\_\_\_

**SITE MAINTENANCE:**

(i.e. litter, fences, roads, other)

<u>Activities</u>	<u>Comments</u>
_____	_____

**CONTROLLED BURN:**

Time start: \_\_\_\_\_ Time end: \_\_\_\_\_

**SITE INSPECTIONS:**

	<u>Observations</u>	<u>Action Taken or Required</u>
Litter	_____	_____
Surface Water	_____	_____
Intermediate Cover	_____	_____
Final Cover	_____	_____
Compaction	_____	_____

**MONITORING:**

Groundwater By \_\_\_\_\_ Record \_\_\_\_\_

**SITE MAINTENANCE:**

\_\_\_\_\_

**OTHER:**

\_\_\_\_\_

(Use back of form to note other activities.)

**CITY OF IQALUIT  
 CITY OF IQALUIT MUNICIPAL LANDFILL  
 WASTE SCREENING FORM**

**GENERAL INFORMATION**

Date and Time:
Transporter Name:
License Plate No.:
Source of Waste:
Transporters Waste Description:  <div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"></div>

**WASTE INSPECTION OBSERVATION (Completed by Landfill Personnel)**

Observation	Yes or No	If yes, explain
Hazardous Waste Labels or Placards		
PCB Transformers, Labels or Placards		
Unrinsed Pesticide Containers		
Bulk or Containerized Liquids		
Free Liquids Present (i.e. oil)		
Sludges, Pastes or Slurries		
Powders, Dust, Smoke or Vapours		
Petroleum Odours		
Lead-Acid Batteries		
Unusual Odours		
Cylinders		
Paint		
Freon Items (fridge, freezer)		
Metal		
Wood (for the burn pile)		
E-Waste		
Other Suspicious Items		
Waste Accepted		

If waste was rejected, explain why: \_\_\_\_\_

What happened to rejected waste: \_\_\_\_\_

\_\_\_\_\_  
**Signature of Landfill Personnel**

\_\_\_\_\_  
**Date**



**CITY OF IQALUIT  
CITY OF IQALUIT MUNICIPAL LANDFILL  
HAZARDOUS MATERIAL LOAD CHECK FORM**

Location \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

Vehicle Description & I.D. \_\_\_\_\_

Vehicle Operator \_\_\_\_\_

Waste Source \_\_\_\_\_

The following noteworthy items were found during this inspection:

Material Description	Container (i.e. Drum)	Quantity (i.e. kg/litre)	Remove to (Location)	Removed by (Name)

Comments and follow-up:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Landfill Foreman's contacted: Time \_\_\_\_\_ Date \_\_\_\_\_

Name of person conducting inspection \_\_\_\_\_

# Appendix **C**

## **Environmental Guideline for the General Management of Hazardous Waste**



# Environmental Guideline for the General Management of Hazardous Waste



Department of Environment  
Government of Nunavut

# GUIDELINE: GENERAL MANAGEMENT OF HAZARDOUS WASTE

Original: April 1999  
Revised: January 2002  
April 2010  
October 2010

This Guideline has been prepared by the Department of Environment's Environmental Protection Division and approved by the Minister of Environment under the authority of Section 2.2 of the *Environmental Protection Act*.

This Guideline is not an official statement of the law and is provided for guidance only. Its intent is to increase the awareness and understanding of the risks and hazards associated with hazardous waste and to assist in its proper management. This Guideline does not replace the need for the owner or person in charge, management or control of a hazardous waste to comply with all applicable legislation and to consult with Nunavut's Department of Environment, other regulatory authorities and qualified persons with expertise in the management of hazardous waste.

Copies of this Guideline are available upon request from:

Department of Environment  
Government of Nunavut  
P.O. Box 1000, Station 1360, Iqaluit, NU, X0A 0H0  
Electronic version of the Guideline is available at <http://env.gov.nu.ca/programareas/environmentprotection>

Cover Photos: E. Paquin



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## Introduction

'Waste' is a term used to describe materials that are no longer wanted or are unusable for their original intended purpose. Many different types of waste are generated each day in Nunavut by industry and small business, hospitals and health centers, schools and individuals during the normal course of carrying out daily activities. Some types of waste pose greater risks than others because of their chemical, physical and biological properties. These wastes are generally referred to as being a 'hazardous waste'. Examples of hazardous waste include discarded paint, used solvents, motor and lubricating oil, cleaning compounds, certain building construction and demolition waste and products with an expired shelf life. They will generally exhibit one or more of the following characteristics - ignitable (i.e. flammable), reactive, corrosive or toxic. Hazardous waste often requires that specific management measures be taken to ensure the health and safety of the environment, workers and the general public.

The purpose of the Environmental Guideline for the General Management of Hazardous Waste (the Guideline) is to ensure the safe, effective and efficient management of hazardous waste in Nunavut. It provides information to generators, carriers and receivers of hazardous waste on its hazards, how best to reduce or eliminate the effects it can have on the environment, worker and public safety and guidance on its storage, registration and transportation.

The *Environmental Protection Act* enables the Government of Nunavut to implement measures that preserve, protect and enhance the quality of the environment. Section 2.2 of the *Act* provides the Minister with authority to develop, coordinate, and administer the Guideline.

The Guideline is not an official statement of the law. For further information and guidance, the owner or person in charge, management or control of a hazardous waste is encouraged to review all applicable legislation and consult the Department of Environment, other regulatory agencies or qualified persons with expertise in hazardous waste management.

### 1.1 Definitions

<i>Carrier</i>	A person who accepts hazardous waste for transportation or transports hazardous waste, whether or not for hire or reward. A carrier is also referred to as a transporter of hazardous waste.
<i>Commercial</i>	Actions undertaken for hire or reward.
<i>Commissioner's Land</i>	Lands that have been transferred by Order-in-Council to the Government of Nunavut. This includes roadways and land subject to block land transfers. Most Commissioner's Land is located within municipalities.
<i>Consignee</i>	A person to whom hazardous waste is being or is intended to be transported. A consignee is also referred to as a receiver of hazardous waste.

<i>Consignor</i>	A person who has possession of hazardous waste immediately before it is transported. A consignor may also be a generator of hazardous waste.
<i>Contaminant</i>	Any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment, (a) endangers the health, safety or welfare of persons, (b) interferes or is likely to interfere with normal enjoyment of life or property, (c) endangers the health of animal life, or (d) causes or is likely to cause damage to plant life or to property.
<i>Dangerous Good</i>	Any product, substance or organism included by its nature or by the <i>Transportation of Dangerous Goods Regulations</i> in any of the classes listed in the Schedule provided in the <i>Transportation of Dangerous Goods Act</i> (Canada).
<i>Empty Container</i>	A container that previously held a hazardous waste and has been emptied to the greatest extent practical or triple rinsed with an appropriate cleaning agent. This does not include containers that previously contained mercury or Class 2.3, 5.1 or 6.1 materials.
<i>Environment</i>	Means the components of the Earth and includes (a) air, land and water, (b) all layers of the atmosphere, (c) all organic and inorganic matter and living organisms, and (d) the interacting natural systems that include components referred to in paragraphs (a) to (c) above.
<i>Generator</i>	The owner or person in charge, management or control of a hazardous waste at the time it is generated or a facility that generates a hazardous waste. A generator may also be a consignor of hazardous waste.
<i>Hazardous Waste</i>	A contaminant that is a dangerous good and is no longer wanted or is unusable for its original intended purpose and is intended for storage, recycling, treatment or disposal. A hazardous waste does not include a contaminant that is (a) household in origin; (b) exempted as a small quantity; (c) returned directly to a manufacturer or supplier of the product, substance or organism for reprocessing, repackaging or resale for any reason; (d) an empty container; or (e) intended for disposal in a landfill or a sewage treatment facility and meets the applicable standards set out in the Environmental Guideline for Industrial Waste Discharges.

<i>Hazardous Waste Management Facility</i>	A commercial facility used for the collection, storage, transfer, treatment, recycling or disposal of a hazardous waste. For clarity, a hazardous waste management facility does not include a municipal landfill or sewage lagoon.
<i>Incompatible Hazardous Waste</i>	A hazardous waste that, when in contact with another substance or hazardous waste under normal circumstances, reacts to produce heat, gas, fire, explosion or a corrosive or toxic substance.
<i>Landfilling</i>	The intentional depositing or placement of waste in or on land for the purposes of disposal.
<i>Long-term Storage</i>	The storage of hazardous waste for a period of 180 days or more.
<i>Manifest</i>	The manifest as set out in Schedule IX to the <i>Export and Import of Hazardous Waste and Hazardous Recyclables Regulations</i> under the <i>Canadian Environmental Protection Act</i> (Canada).
<i>Minister</i>	The Minister of Environment of the Government of Nunavut.
<i>Qualified Person</i>	A person who has an appropriate level of knowledge and experience in all relevant aspects of hazardous waste management.
<i>Receiver</i>	A person to whom hazardous waste is being or is intended to be transported. A receiver is also referred to as a consignee of hazardous waste.
<i>Responsible Party</i>	The owner or person in charge, management or control of the hazardous waste.
<i>Small Quantity</i>	Hazardous waste that is generated in an amount that is less than five kilograms per month if a solid or less than five litres per month if a liquid, and where the total quantity accumulated at any one time does not exceed five kilograms or five litres. This does not include hazardous waste that is mercury or Class 2.3, 5.1 or 6.1 materials. These wastes must be generated in an amount that is less than one kilogram per month if a solid or less than one litre per month if a liquid, and where the total quantity accumulated at any one time does not exceed one kilogram or one litre.
<i>Transport Authority</i>	The statute and regulations controlling the management of hazardous waste under that mode of transport. These include (a) Road and Rail - <i>Transportation of Dangerous Goods Act</i> (Canada) and <i>Regulations; Interprovincial Movement of Hazardous Waste Regulations</i> (CEPA) and <i>Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations</i> (CEPA). (b) Air – <i>International Air Transport Association (IATA) Dangerous Goods Regulations</i> and <i>International Civil Aviation Organization (ICAO) Technical Instructions</i> ; and

(c) Marine – *International Maritime Dangerous Goods Code (IMDG)*.

<i>Transfer</i>	The temporary storage of hazardous waste for a period of 179 days or less for the purpose of changing from one vehicle or means of transportation to another.
<i>Transporter</i>	A person who accepts hazardous waste for transportation or transports hazardous waste, whether or not for hire or reward. A transporter is also referred to as a carrier of hazardous waste.
<i>Waste Audit</i>	An inventory or study of the amount and type of waste that is produced at a location.

## **1.2 Roles and Responsibilities**

### **1.2.1 Environmental Protection Division**

The Environmental Protection Division of the Department of Environment is the key environmental agency responsible for ensuring the proper management of hazardous waste and other contaminants on Commissioner's Land. Authority is derived from the *Environmental Protection Act*, which prohibits the discharge of contaminants to the environment and enables the Minister to undertake actions to ensure appropriate management measures are in place. Although programs and services are applied primarily to activities taking place on Commissioner's and municipal lands and to Government of Nunavut undertakings, the *Environmental Protection Act* may be applied to the whole of the territory where other controlling legislation, standards and guidelines do not exist. A complete listing of relevant legislation and guidelines can be obtained by contacting the Department of Environment or by visiting the web site at <http://env.gov.nu.ca/programareas/environmentprotection>.

The Department of Environment will provide advice and guidance on the proper management of hazardous waste. However, it remains the responsibility of the owner or person in charge, management or control of the hazardous waste to ensure compliance with all applicable statutes, regulations, standards, guidelines and local by-laws.

### **1.2.2 Generators of Hazardous Waste**

The generator is the owner or person in charge, management or control of the hazardous waste at the time it is produced or of the facility that produces the hazardous waste. The generator is responsible for any and all hazardous waste produced and must ensure the hazardous waste is properly and safely managed from the time it is generated to its final disposal. This is referred to as managing the waste from cradle-to-grave.

Contractors may manage hazardous waste on behalf of the generator. However, the generator remains responsible for determining whether the waste is hazardous and ensuring the method of management complies with all applicable statutes, regulations, standards, guidelines and local by-laws. If the contractor does not comply with the requirements of the *Environmental Protection Act* and is charged with a violation while managing the waste, the generator may also be held liable.

The basic responsibilities of a hazardous waste generator in Nunavut are:

- Registering with the Department of Environment as a generator of hazardous waste.
- Registering the facility with the Department of Environment as a hazardous waste management facility where the facility is used for commercial purposes and is intended for the storage of hazardous waste for a period of 180 days or more, where stored quantities exceed the criteria set out in Appendix 8 or where hazardous waste is recycled, treated or disposed of in quantities in any single month that exceed a 'small quantity'.
- Classifying and labeling hazardous waste in accordance with the Transport Authority.
- Managing the hazardous waste in accordance with the Guideline, *Environmental Protection Act*, *Fire Prevention Act*, *Safety Act*, *Public Health Act* and all other applicable statutes, regulations, standards, guidelines and local by-laws.
- Reusing, recycling, treating or disposing of the hazardous waste in a proper and safe manner.
- Where the hazardous waste is transported off-site, completing Part A of the waste manifest form and retaining a copy for two years, using a registered hazardous waste carrier to transport the waste and sending the waste to a registered receiver or hazardous waste management facility.
- Ensuring staff are trained and qualified to safely handle the hazardous waste.
- Filing a spill contingency plan with the Minister where stored quantities of hazardous waste exceed the criteria set out in Schedule A of the *Spill Contingency Planning and Reporting Regulations*.
- Reporting any spill immediately to the NWT/Nunavut Spill Report Line at (867) 920-8130.

Further information and application forms for registering as a generator or a hazardous waste management facility are available from the Department of Environment. Refer to sections 3.2.1 and 3.2.2 and Appendices 4 and 7 for further information.

### **1.2.3 Carriers of Hazardous Waste**

Hazardous waste must be transported in accordance with the appropriate Transport Authority: Road and Rail - *Transportation of Dangerous Goods Act (Canada) and Regulations, Interprovincial Movement of Hazardous Waste Regulations (CEPA) and Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (CEPA)*; Air – *International Air Transport Association (IATA) Dangerous Goods Regulations* and *International Civil Aviation Organization (ICAO) Technical Instructions*; and Marine – *International Maritime Dangerous Goods Code (IMDG)*.

Carriers operating in Nunavut must be registered with the Department of Environment before transporting hazardous waste. Other basic responsibilities of hazardous waste carriers are:

- Placarding and labeling all transport vehicles and containers in accordance with the appropriate Transport Authority.
- Completing Part B of the waste manifest form and retaining a copy for two years.
- Accepting hazardous waste only from registered generators and safely transporting hazardous waste only to a registered receiver or hazardous waste management facility.
- Ensuring staff are trained and qualified to safely transport hazardous waste.
- Reporting any spill immediately to the NWT/Nunavut Spill Report Line at (867) 920-8130.

Further information and application forms for registering as a hazardous waste carrier are available from the Department of Environment. Refer to section 3.2.1 and Appendix 5 for further information.

#### **1.2.4 Receivers of Hazardous Waste**

Any person receiving or accepting hazardous waste in Nunavut for the purpose of storage, transfer, reuse, recycling, treatment or disposal must be registered with the Department of Environment as a hazardous waste receiver. The facility must also be registered as a hazardous waste management facility where it is used for commercial purposes and is used to store hazardous waste for a period of 180 days or more, store quantities that exceed the criteria set out in Appendix 8 or hazardous waste is recycled, treated or disposed of in quantities in any single month that exceed a 'small quantity'. Other basic responsibilities of hazardous waste receivers in Nunavut are:

- Handling and storing the hazardous waste in accordance with the Guideline, *Environmental Protection Act*, *Fire Prevention Act*, *Safety Act*, *Public Health Act* and all other applicable statutes, regulations, standards, guidelines and local by-laws.
- Reusing, recycling, treating or disposing of the hazardous waste in a proper and safe manner.
- Completing Part C of the waste manifest form and retaining a copy for two years.
- Accepting hazardous waste only from registered generators and carriers.
- Ensuring staff are trained and qualified to safely handle hazardous waste.
- Filing a spill contingency plan with the Minister where stored quantities of hazardous waste exceed the criteria set out in Schedule A of the *Spill Contingency Planning and Reporting Regulations*.
- Reporting any spill immediately to the NWT/Nunavut Spill Report Line at (867) 920-8130.

Further information and application forms for registering as a receiver or hazardous waste management facility are available from the Department of Environment. Refer to sections 3.2.1 and 3.2.2 and Appendices 6 and 7 for further information.

#### **1.2.5 Other Regulatory Agencies**

Other regulatory agencies may have to be consulted regarding the management of hazardous waste as there may be other environmental or public and worker health and safety issues to consider. Some of the other agencies include:

##### **Department of Economic Development and Transportation**

The Motor Vehicles Division is responsible for ensuring the safe transport of hazardous waste and other dangerous goods by road through administration of the *Transportation of Dangerous Goods Act*. The Department is also responsible under the *Motor Vehicles Act* for driver licensing and various other vehicle and load safety matters.

### **Workers' Safety and Compensation Commission**

The Workers' Safety and Compensation Commission is responsible for promoting and regulating worker and workplace health and safety in Nunavut. The Commission derives its authority from the *Workers' Compensation Act* and *Safety Act* which require an employer to maintain a safe workplace and ensure the safety and well being of workers. The Workplace Hazardous Materials Information System, or WHMIS, requires information be provided to workers on the safe use of any hazardous material used in the workplace. All hazardous waste generators, carriers and receivers should consult the Prevention Services Division for further information and guidance.

### **Department of Community and Government Services**

The Department of Community and Government Services is responsible under the *Commissioners' Lands Act* for the issuance of land leases, reserves, licenses and permits on Commissioner's Lands. The Department, in cooperation with communities, is also responsible for the planning and funding of municipal solid waste and sewage disposal facilities in most Nunavut communities. Emergency planning responsibilities under the *Emergency Measures Act* include developing territorial emergency response plans, coordinating emergency operations at the territorial and regional levels and supporting community emergency response operations.

The Office of the Fire Marshal is responsible for ensuring the safe storage, handling and use of flammable and combustible liquids and materials. The Office of the Fire Marshal derives its authority from the *Fire Prevention Act*, National Fire Code and National Building Code.

### **Department of Health and Social Services**

Activities related to the generation, storage, transportation, treatment and disposal of hazardous waste may have an impact on public health. The Office of the Chief Medical Officer of Health and Regional Environmental Health Officers should be consulted regarding legislated requirements under the *Public Health Act*.

### **Environment Canada**

Environment Canada is responsible under the *Canadian Environmental Protection Act* for ensuring the safe management of designated hazardous waste at federal facilities and on federal lands. The management, disposal and export of polychlorinated biphenyl (PCB) waste is controlled under the *PCB Regulations*, the *Federal Mobile PCB Treatment and Destruction Regulations* and the *PCB Waste Export Regulations*. The interprovincial and international transport of waste is controlled under the *Interprovincial Movement of Hazardous Waste Regulations* and the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. Environment Canada is also responsible for administering the pollution prevention provisions of the federal *Fisheries Act*.

### **Indian and Northern Affairs Canada**

Indian and Northern Affairs Canada is responsible under the *Territorial Lands Act* and *Nunavut Waters and Nunavut Surface Rights Tribunal Act* for the management of federal lands and waters in Nunavut, including the impact hazardous waste may have on the quality of these lands and waters.

### **Natural Resources Canada**

The *Explosives Act* provides Natural Resources Canada with authority to manage explosives in Canada, including waste explosives. The Canadian Nuclear Safety Commission, which reports to Parliament through the Minister of Natural Resources, administers the safe handling and disposal of radioactive materials and licenses institutions and companies to possess and use radioactive materials under the *Nuclear Safety and Control Act* and *Nuclear Liability Act*.

### **Local Municipal Governments**

The role of municipal governments is important in the proper local management of hazardous waste. Under the Nunavut Land Claim Agreement, municipalities are entitled to control their own municipal disposal sites. Hazardous waste may be deposited into municipal landfill sites and sewage treatment facilities only with the consent of the local government. Local environmental and safety standards are determined, in part, by how the property is designated under municipal government development plans (i.e. land use zoning). The local fire department may also be called upon if a fire or other public safety issue is identified.

### **Co-management Boards and Agencies**

Co-management boards and agencies established under the Nunavut Land Claim Agreement have broad authority for land use planning, impact assessment and the administration of land and water. Activities involving hazardous waste may be controlled through the setting of terms and conditions in plans, licenses and permits issued by the Nunavut Water Board and other co-management boards and agencies.

Appendix 3 provides further assistance in determining the primary regulatory agency contact for managing hazardous waste in Nunavut.

Appendix 11 provides mailing addresses, phone and fax numbers for each of the regulatory agencies.

## Management of Hazardous Waste

### 2.1 What is Hazardous Waste?

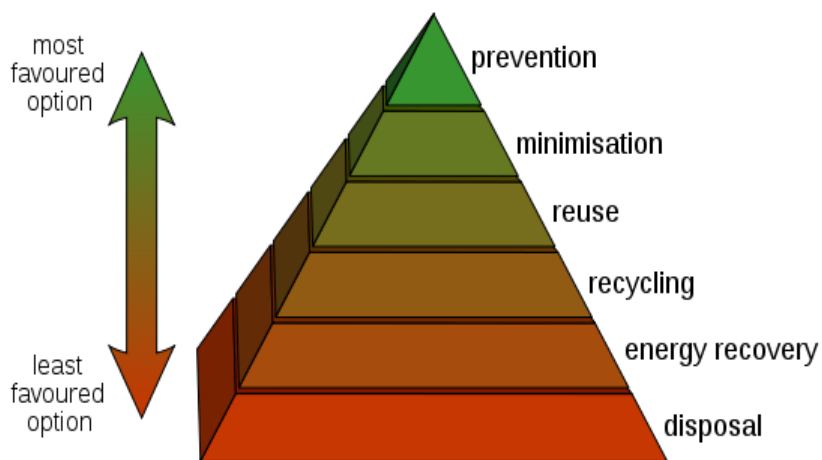
Hazardous waste is unwanted material or products that can cause illness or death to people, plants and animals. It may be a liquid, solid, sludge or gas and contain chemicals, heavy metals, radioactives, infectious organisms or other toxic substances. It may be a single product or a combination of many hazardous and non-hazardous materials (i.e. mixed waste). Its harmful effects may exist for a relatively short period of time (i.e. oil-based paint before hardening) or continue for hundreds of years. It can persist in soil, water and sediment (i.e. radioactive materials) or bioaccumulate in plants and animals (i.e. mercury, PCBs).

Hazardous waste is generated by everybody. Households commonly generate unwanted gasoline, brake and windshield wiper fluid, cleaning supplies, paints and paint thinners, lead acid batteries, used computer equipment and construction materials (i.e. asbestos), pesticides and others. Hospitals and nursing stations generate unwanted needles and waste human tissue, body fluids and biotic cultures. Business and industry generate many different types of hazardous waste including used motor and lubricating oil, cleaning solvent, drilling fluid and cuttings and mine tailings.

### 2.2 Waste Management

Proper waste management simply makes good sense. Minimizing or eliminating the generation of hazardous and other waste helps to reduce the hazards and costs associated with its handling, storage, transport, recycling, treatment and disposal. It also reduces the impacts waste could have on the environment, human and worker health and safety and reduces the global emission of greenhouse gases by minimizing the use of raw materials. Another term commonly used to describe activities that reduce the amount of material entering a waste stream or being released to the environment is 'pollution prevention'.

Once a waste is created, the generator is responsible for its safe management from cradle-to-grave. Waste generators can prevent pollution and reduce costs by implementing various waste reduction, reuse and recycling programs through changes to operational procedures, maintenance practices and raw material use. Treating and disposing of waste either locally or outside of Nunavut should be considered only if reuse and recycling options are not available or practical.



### **2.2.1 Reduce and Minimize – the first option**

Using raw materials efficiently and reducing the amount of waste generated is the first and most important step in effective waste management. Both environmentally and economically, consuming less is the most fundamental and effective step to reducing waste.

A waste audit should be undertaken to inventory and study the waste produced at a location or business. The audit should identify the type and amount of waste being generated, the costs of current management methods including handling, storage, treatment, transport and disposal, and examine opportunities and set targets for reducing or reusing waste. These opportunities include awareness and education, the substitution or reduction of purchased raw materials, production redesign, process changes and improved maintenance activities. Other opportunities include purchasing products that are durable or are manufactured from environmentally-friendly materials (i.e. biodegradable or post-consumer materials), avoiding products that are designed for single or short life usage and buying only the quantity that is needed. Effective communications is critical to the success of any waste reduction program.

### **2.2.2 Reuse and Recycle**

Even with effective waste reduction measures in place there will be waste generated. Reusing the waste product for a different but related purpose (reuse) or producing a new product from the original material (recycle) is an effective way to reduce the volume of waste. The waste audit should identify whether opportunities are available for reusing or recycling waste within the generating facility. Alternatively, other local or distant users may be found to reuse or recycle the waste that would otherwise require treatment or disposal.

The Department of Environment encourages the reuse and recycling of hazardous and other waste in the following ways:

- Local reuse and recycle programs are available in various communities for some types of hazardous waste including used oil and waste fuel. Generators should contact the Department of Environment or local municipal government for the names of registered waste receivers or other opportunities to reuse or recycle wastes locally.
- Waste exchanges and associations offer opportunities for waste generators to transfer unwanted, overstocked, obsolete, damaged, contaminated and post-dated material to another person or company that can use it. In some cases, the receiving company will purchase the waste from the generator. Appendix 10 provides a listing of several waste exchanges and associations in Canada.

### **2.2.3 Treatment and Disposal in Nunavut**

Treatment and disposal of a hazardous waste is the last step in effective waste management and should be undertaken only after all other practical reuse and recycle options have been examined.

Treatment covers a broad spectrum of activities. It includes any method, technique or process that will change the physical, chemical or biological character or composition of a hazardous waste so as to reduce its volume, neutralize or make the waste less hazardous and make it safer to transport or store

prior to its disposal. In some cases, more than one process may be required to treat the waste. Facilities in Nunavut at which hazardous waste is stored, treated, recycled or disposed of for commercial purposes must be registered as a hazardous waste management facility. The owner or operator of a facility should refer to section 3.2.2 and Appendix 7 for further information.

It is a contravention of the *Environmental Protection Act* for hazardous waste to be abandoned or disposed of on land or into water in Nunavut. Although a detailed discussion on specific hazardous waste disposal methods is beyond the scope of the Guideline, the following are general points for consideration:

- Hazardous waste must not be mixed or diluted with another substance, or divided into smaller quantities, simply to avoid meeting the definition of a hazardous waste.
- The generator is responsible for determining how hazardous waste can be safely disposed of and to comply with all applicable statutes, regulations, standards, guidelines and local by-laws. The Department of Environment will provide advice and guidance on the management of hazardous waste. Other sources of information and assistance include:
  - Manufacturer or distributor of the new product;
  - Manufacturer's Material Safety Data Sheets (MSDS); and
  - Waste exchanges and associations, other regulatory authorities, waste management consultants and other qualified persons with expertise in the management of hazardous waste.
- Hazardous waste that meets standards set out in the Environmental Guideline for Industrial Waste Discharges may be directed to municipal landfills and sewage treatment systems for disposal. The local municipal government must be consulted and consent to the use of their facility prior to the waste being disposed. Waste that does not meet the standards set out in the Environmental Guideline for Industrial Waste Discharges must be treated prior to disposal or transported to a facility that is registered to accept the waste.
- The open burning of hazardous waste is not an acceptable practice as toxic substances may be released into the atmosphere.
- Incompatible hazardous waste should not be mixed, combined or stored together in the same container as new hazards may be created. Combining or mixing one waste with another waste may also prevent its reuse or recycling and increase disposal costs.
- Containers that previously held a hazardous waste must be emptied to the greatest extent practical or triple rinsed with an appropriate cleaning agent prior to disposal. The rinsings must then also be managed according to their waste characteristics. Cleaned containers should be rendered unusable by puncturing or crushing prior to disposal to prevent their reuse. This is especially important for containers that could be reused for water or food storage.

The Department of Environment will consider alternate hazardous waste management and disposal measures that provide an equivalent level of environmental protection to those identified in this Guideline.

#### **2.2.4 Treatment and Disposal Outside Nunavut**

Hazardous waste can be sent to a receiver or hazardous waste management facility located outside of Nunavut only where the receiver or facility has been registered in the receiving province or territory to

accept that waste. The generator must comply with all applicable statutes, regulations, standards, guidelines and local by-laws of the receiving jurisdiction.

Within Canada, Environment Canada monitors and controls the interprovincial movement of hazardous waste under the *Interprovincial Movement of Hazardous Waste Regulations*. Waste manifests must accompany each shipment of waste in accordance with the Transport Authorities' requirements. Generators and carriers should refer to section 3.3 of the Guideline for additional information on transport and waste manifest requirements.

The international movement of hazardous waste is controlled under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Known simply as the Basel Convention, it is an international treaty to control and reduce the transfer of hazardous waste from developed to less developed countries. Environment Canada monitors and controls the international movement of hazardous waste under the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*.

A listing of Canadian waste management facilities may be obtained by contacting the waste exchanges and other organizations listed in Appendix 10.

## General Requirements

Hazardous waste is classified using the system developed under the *Transportation of Dangerous Goods Act (Canada)*. Wastes are categorized into one of nine classes according to their chemical, physical or biological properties. Each waste, or group of similar wastes, is then identified using a specific 'UN' number assigned under the *Transportation of Dangerous Goods Regulations*. Refer to Appendix 2 for additional information on dangerous goods classifications.

### 3.1 Storage

Storage refers to containment of a hazardous waste for transport, or while awaiting treatment and disposal. Except under extraordinary circumstances (i.e. radioactive materials), storage should always be considered as a temporary measure and is not acceptable for the long-term management of hazardous waste.

Recognition of the incompatibility of different wastes during storage is important in order to avoid the possibility of violent, explosive reactions and toxic fumes. Various systems have been developed to ensure compatible storage including the 'Hazardous Waste Compatibility Chart' adopted by the United States' Environmental Protection Agency<sup>1</sup>.

#### 3.1.1 Containers

Hazardous waste storage containers are designed to hold, store and transport small quantities of waste. Many different types of containers are available (i.e. barrels, bottles, bags and boxes) and are made from a variety of materials (i.e. aluminum, plastic, steel, and stainless steel). Selecting the proper container requires an understanding of the properties of the waste to be stored. If transport is to be undertaken, the generator should consult the Transport Authority to confirm the container meets all legislated requirements.

The following are additional general points for consideration:

- Hazardous waste should be stored in their original containers where possible or in containers specially manufactured for the purpose of storing hazardous waste. The containers must be sound, sealable and not damaged or leaking.
- Containers should be clearly labeled to identify their contents according to requirements of the Workplace Hazardous Materials Information System (WHMIS) and the relevant Transport Authority, if transport is planned.
- Small quantities of compatible hazardous waste should be bulked into 16 gauge or equivalent metal or plastic 205 litre (45 gallon) drums for the purpose of secondary containment.
- Containers should be closed and sealed at all times, except while waste is being added or removed.

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<sup>1</sup> EPA-600/2-80-076 April 1980. A Method for Determining the Compatibility of Chemical Mixtures.

### **3.1.2 Facilities**

A hazardous waste storage facility is a specially designed building or area that helps to ensure the safe and secure storage of hazardous waste. Detailed storage facility building designs are beyond the scope of the Guideline. The Department of Environment or other qualified person should be consulted prior to designing and constructing a storage facility.

The following are general points to consider when establishing a storage facility:

- The facility should meet all local and territorial siting and construction requirements and be readily accessible for fire fighting and other emergency responses. The local Fire Chief should be advised of the storage facility and its contents for emergency planning and response purposes.
- The facility should be secure. Access should be limited where practical to employees who have been trained in safety and emergency procedures. These procedures should be documented and a copy made available to those employees who have access to the facility.
- Inspections of the facility and stored wastes should be performed and recorded at least once every week.
- Containers should be placed so that each can readily and easily be inspected for signs of leakage, corrosion or deterioration. Leaking, corroded or deteriorated containers should immediately be removed and their contents transferred to a sound container.
- Records should be maintained indicating the type and quantity of waste being stored along with the date, type and quantity of hazardous waste brought into or removed from the facility.
- Drainage into and from the storage facility site should be controlled to prevent spills or leaks from leaving the site and to prevent run-off from entering the site.
- All waste should be stored on a firm working surface that is impervious to leaks.
- Incompatible waste must be stored in a manner that contact in the event of a spill or accidental release is not possible.
- Emergency response plans should be developed in cooperation with local emergency response personnel and emergency response equipment should be locally available in the event of a spill, fire or other emergency situation.

Where the facility is used for commercial purposes and is used to store hazardous waste for periods of 180 days or more or the quantity of waste stored on-site exceeds the criteria set out in Appendix 8, the facility must be registered with the Department of Environment as a hazardous waste management facility.

## **3.2 Registration**

### **3.2.1 Hazardous Waste Generators, Carriers and Receivers**

Generators, carriers and receivers of hazardous waste must be registered before undertaking activities involving these wastes. Completion of the approved form and submission of accurate information enables the Department of Environment to quickly complete the registration process. Registration enables the government to track the generation, transport and disposal of hazardous waste in Nunavut. It also provides assurance that the company has the necessary emergency response and spill

contingency plans in place should an accident or other incident occur involving a hazardous waste. Upon registration, the applicant will be assigned a unique identification number. This number is required in order to complete the waste manifest form.

Appendices 4, 5 and 6 provide samples of registration forms required for generators, carriers and receivers to apply for registration in Nunavut. Original forms and users' guides are available from Nunavut's Department of Environment or by downloading through the department's web site. Incomplete applications will result in delays in completing the registration process.

Generators and receivers of hazardous waste located in Nunavut must be registered with the Department of Environment. Carriers may be registered either in Nunavut or in the province or territory in which the company is based.

### **3.2.2 Hazardous Waste Management Facilities**

A hazardous waste management facility is a facility or specially-designated area that is used for the collection, storage, transfer, treatment, recycling or disposal of hazardous waste for commercial purposes. Where the facility is used solely for the collection, storage or transfer of hazardous waste, the facility must be registered where waste is stored for a period of 180 days or more or the quantities exceed those set out in Appendix 8 of the Guideline. Where the facility is to be used for the treatment, recycling or disposal of hazardous waste, the facility must be registered where the quantity treated, recycled or disposed of in any single month exceeds a 'small quantity'.

The collection, storage, transfer, treatment, recycling or disposal of hazardous waste on behalf of a third-party does not remove the obligation of the owner or operator of a hazardous waste management facility to register the facility.

Appendix 7 includes a sample of the registration form required for the owner or operator of a hazardous waste management facility to apply for registration of the facility. The owner or operator may obtain an original form and users' guide by contacting Nunavut's Department of Environment or by downloading through the department's web site. Incomplete applications will result in delays in completing the registration process.

Registration of a hazardous waste management facility does not remove the obligation to comply with all other applicable municipal, territorial and federal statutes, regulations, standards, guidelines and by-laws. Guidance on planning for and achieving territorial environmental requirements for new industrial projects may be found in the *Environmental Guideline for Industrial Projects on Commissioner's Lands*.

### **3.3 Transportation**

Carriers must ensure hazardous waste is packaged, documented, labeled and placarded in compliance with the method of transport used - road, rail, air or marine. A completed waste manifest must accompany each shipment of hazardous waste. Completion of the manifest together with proper marking and placarding of containers and vehicles enables police, ambulance, fire and other first responders to react effectively and safely in the event of a spill or other accident involving hazardous waste while in transit.

The transport of hazardous waste by road in Canada is controlled under the territorial and federal *Transportation of Dangerous Goods Acts* and the federal *Interprovincial Movement of Hazardous Waste Regulations* and *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. These Acts and Regulations require that personnel are trained, containers and transport vehicles are labeled and placarded and a completed waste manifest accompanies each shipment. The generator, carrier and receiver must each complete their portion of the manifest form and provide copies to the Department of Environment at various stages in the transport process. Refer to Appendix 9 for a copy of the manifest. Original manifest forms are available from Nunavut's Department of Environment and completion instructions are included on the reverse side of each manifest. Further assistance in completing a waste manifest may be obtained by referring to the *User's Guide for the Hazardous Waste Manifest* produced by Environment Canada or by contacting the Motor Vehicles Division of the Department of Economic Development and Transportation.

The International Air Transport Association (IATA) requires that all shipments of hazardous wastes tendered to air carriers be accompanied by the IATA Shipper's Declaration of Dangerous Goods. The consignor is responsible for completion of the form in accordance with IATA requirements and to ensure all packaging, placarding and labeling is consistent with the product being transported.

The International Marine Dangerous Goods Code requires use of the International Marine Organization's Multimodal Dangerous Goods Form when transporting dangerous goods or hazardous waste by ship or barge.

Further information on transporting hazardous waste by air or marine can be obtained by contacting Transport Canada. Information and instructions on manifesting, placarding and labeling hazardous waste commonly generated in Nunavut can be obtained by referring to waste-specific guidelines produced by the Department of Environment. A complete listing of guidelines is available at <http://env.gov.nu.ca/programareas/environmentprotection>.

## Conclusion

This is a general introduction to the risks associated with hazardous waste and is intended to inform the reader about the proper handling, storage and transportation of hazardous waste in Nunavut. Detailed guidance on the management of specific waste types can be obtained by referring to other guidelines developed by the Department of Environment.

For additional information on the management of hazardous waste, or to obtain a complete listing of available guidelines, contact the Department of Environment at:

Environmental Protection Division  
Department of Environment  
Government of Nunavut  
Inuksugait Plaza, Box 1000, Station 1360  
Iqaluit, Nunavut, X0A 0H0

Phone: (867) 975-7729

Fax: (867) 975-7739

Email: [EnvironmentalProtection@gov.nu.ca](mailto:EnvironmentalProtection@gov.nu.ca)

Website: <http://env.gov.nu.ca/programareas/environmentprotection>

## References

Government of Alberta, Department of Environment. Alberta Users Guide for Waste Managers, (Catalogue # ENV-266-O/P).

Government of Alberta, Department of Environment. Hazardous Waste Storage Guidelines, (1988).

Government of the Northwest Territories, Department of Environment and Natural Resources. User's Guide for Hazardous Waste Movement Documents in the NWT, (2009).

Government of the Northwest Territories, Department of Municipal and Community Affairs. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories, (2003).

Government of Nunavut, Department of Environment. Environmental Guideline for General Management of Hazardous Waste, (2002).

Government of Nunavut, Department of Environment. Environmental Guideline for Industrial Projects on Commissioner's Lands, (2002).

Government of Nunavut, Department of Environment. Environmental Guideline for Industrial Waste Discharges, (2002).

## **APPENDICES**



## **APPENDIX 1 - ENVIRONMENTAL PROTECTION ACT**

The following are excerpts from the *Environmental Protection Act*

1. "Contaminant" means any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment,
  - (a) endangers the health, safety or welfare of persons,
  - (b) interferes or is likely to interfere with normal enjoyment of life or property,
  - (c) endangers the health of animal life, or
  - (d) causes or is likely to cause damage to plant life or to property;

"Discharge" includes, but not so as to limit the meaning, any pumping, pouring, throwing, dumping, emitting, burning, spraying, spreading, leaking, spilling, or escaping;

"Environment" means the components of the Earth and includes

- (a) air, land and water,
- (b) all layers of the atmosphere,
- (c) all organic and inorganic matter and living organisms, and
- (d) the interacting natural systems that include components referred to in paragraphs (a) to (c).

"Inspector" means a person appointed under subsection 3(2) and includes the Chief Environmental Protection Officer.

- 2.2 The Minister may
  - (a) establish, operate and maintain stations to monitor the quality of the environment in the Territories;
  - (b) conduct research studies, conferences and training programs relating to contaminants and to the preservation, protection or enhancement of the environment;
  - (c) develop, co-ordinate and administer policies, standards, guidelines and codes of practice relating to the preservation, protection or enhancement of the environment;
  - (d) collect, publish and distribute information relating to contaminants and to the preservation, protection or enhancement of the environment:
3. (1) The Minister shall appoint a Chief Environmental Protection Officer who shall administer and enforce this Act and the regulations.  
  
(2) The Chief Environmental Protection Officer may appoint inspectors and shall specify in the appointment the powers that may be exercised and the duties that may be performed by the inspector under this Act and regulations.
5. (1) Subject to subsection (3), no person shall discharge or permit the discharge of a contaminant into the environment.  
  
(3) Subsection (1) does not apply where the person who discharged the contaminant or permitted the discharge of the contaminant establishes that
  - (a) the discharge is authorized by this Act or the regulations or by an order issued under this Act or the regulations;
  - (b) the contaminant has been used solely for domestic purposes and was discharged from within a dwelling house;
  - (c) the contaminant was discharged from the exhaust system of a vehicle;
  - (d) the discharge of the contaminant resulted from the burning of leaves, foliage, wood, crops or stubble for domestic or agricultural purposes;

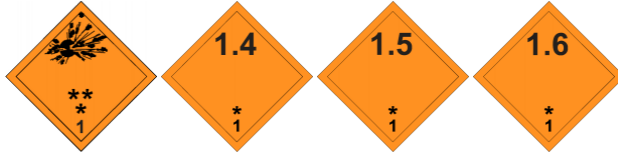
- (e) the discharge of the contaminant resulted from burning for land clearing or land grading;
- (f) the discharge of the contaminant resulted from a fire set by a public official for habitat management of silviculture purposes;
- (g) the contaminant was discharged for the purposes of combating a forest fire;
- (h) the contaminant is a soil particle or grit discharged in the course of agriculture or horticulture; or
- (i) the contaminant is a pesticide classified and labelled as "domestic" under the *Pest Control Products Regulations* (Canada).

(4) The exceptions set out in subsection (3) do not apply where a person discharges a contaminant that the inspector has reasonable grounds to believe is not usually associated with a discharge from the excepted activity.

- 5.1. Where a discharge of a contaminant into the environment in contravention of this Act or the regulations or the provisions of a permit or license issued under this Act or the regulations occurs or a reasonable likelihood of such a discharge exists, every person causing or contributing to the discharge or increasing the likelihood of such a discharge, and the owner or the person in charge, management or control of the contaminant before its discharge or likely discharge, shall immediately:
- (a) subject to any regulations, report the discharge or likely discharge to the person or office designated by the regulations;
  - (b) take all reasonable measures consistent with public safety to stop the discharge, repair any damage caused by the discharge and prevent or eliminate any danger to life, health, property or the environment that results or may be reasonably expected to result from the discharge or likely discharge; and
  - (c) make a reasonable effort to notify every member of the public who may be adversely affected by the discharge or likely discharge.
6. (1) Where an inspector believes on reasonable grounds that a discharge of a contaminant in contravention of this Act or the regulations or a provision of a permit or license issued under this Act or the regulations has occurred or is occurring, the inspector may issue an order requiring any person causing or contributing to the discharge or the owner or the person in charge, management or control of the contaminant to stop the discharge by the date named in the order.
7. (1) Notwithstanding section 6, where a person discharges or permits the discharge of a contaminant into the environment, an inspector may order that person to repair or remedy any injury or damage to the environment that results from the discharge.
- (2) Where a person fails or neglects to repair or remedy any injury or damage to the environment in accordance with an order made under subsection (1) or where immediate remedial measures are required to protect the environment, the Chief Environmental Protection Officer may cause to be carried out the measures that he or she considers necessary to repair or remedy an injury or damage to the environment that results from any discharge.

## APPENDIX 2 - DANGEROUS GOODS CLASSIFICATIONS

### Class 1 – Explosives<sup>1</sup>



### Class 2 – Compressed Gases

Division 2.1 – Flammable Gases

Division 2.2 – Non-flammable and Non-toxic Gases

Division 2.3 – Poison Gases



### Class 3 - Flammable Liquids



### Class 4 – Flammable Solids

Division 4.1 – Flammable Solids

Division 4.2 – Spontaneously Combustible

Division 4.3 – Water Reactive



### Class 5 - Oxidizing Substances and Organic Peroxides

Division 5.1 – Oxidizing Substances

Division 5.2 – Organic Peroxides



## Class 6 - Toxic and Infectious Substances

Division 6.1 – Toxic Substances

Division 6.2 – Infectious Substances



## Class 7 - Radioactive Materials<sup>2</sup>



## Class 8 - Corrosives

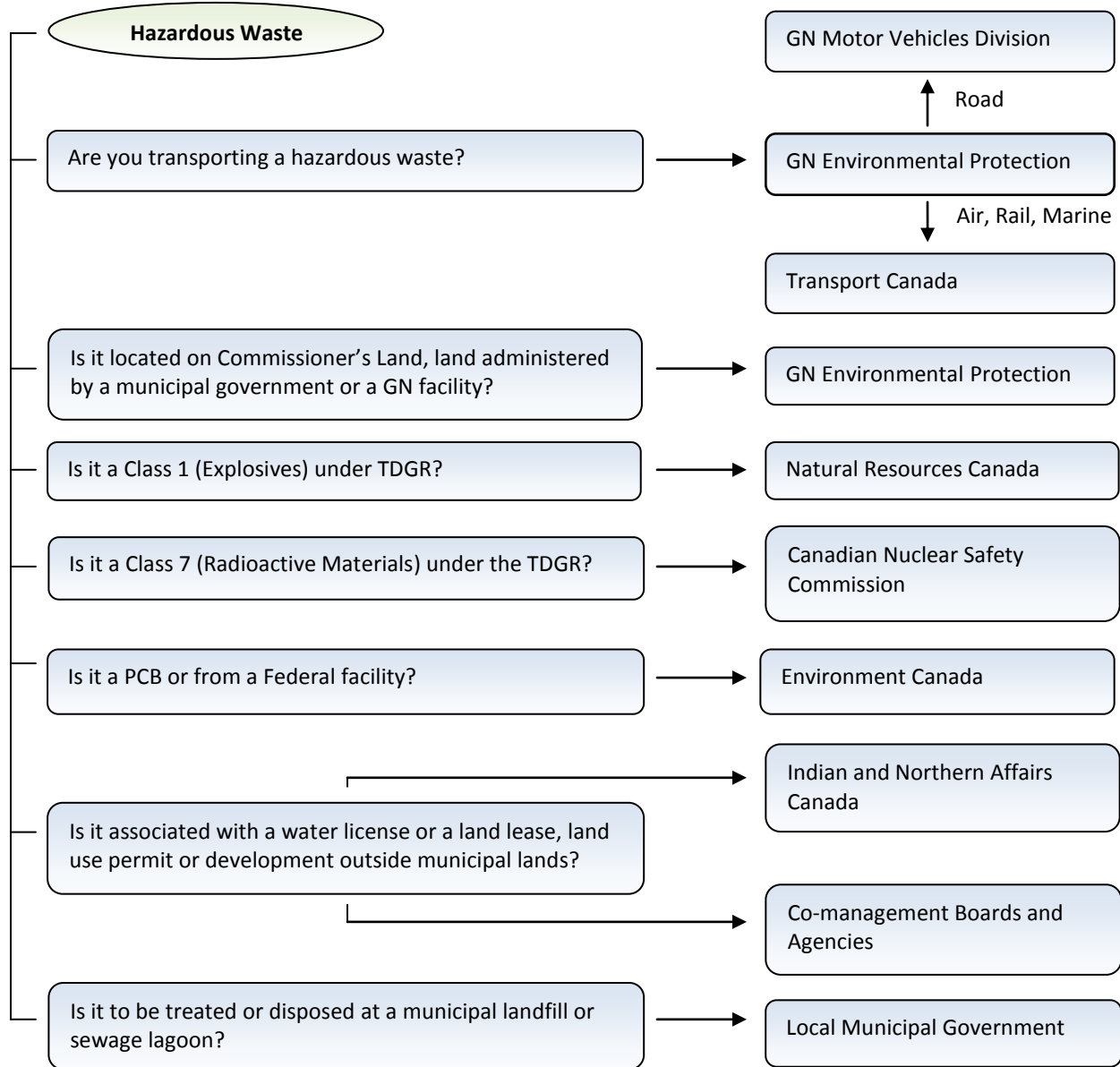


## Class 9 - Miscellaneous



1. Class 1 substances (Explosives) are regulated by Natural Resources Canada under the *Explosives Act*.
2. Class 7 substances (Radioactive Materials) are regulated by the Canadian Nuclear Safety Commission under the *Nuclear Safety and Control Act* and *Nuclear Liability Act*.

### APPENDIX 3 - DETERMINING REGULATORY AGENCY CONTACTS



## APPENDIX 4 – REGISTRATION FORM – HAZARDOUS WASTE GENERATOR

A copy of the generator registration form and users' guide is available by contacting the Department of Environment or by downloading at <http://env.gov.nu.ca/programareas/environmentprotection>.

Instructions								
<ol style="list-style-type: none"> <li>1. The following information must be provided in order to register as a hazardous waste generator in Nunavut and to obtain a generator number. Incomplete applications will be returned to the applicant.</li> <li>2. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to <a href="mailto:EnvironmentalProtection@gov.nu.ca">EnvironmentalProtection@gov.nu.ca</a>.</li> <li>3. Use additional pages to provide information as required.</li> <li>4. Applicants should refer to the accompanying users' guide for further assistance on completing the generator registration form.</li> </ol>								
Section 1 - Identification								
Generator (Legal Name) _____ Mailing Address _____ Postal Code _____ Principle Contact Person _____ Title _____ Phone _____ Email _____ Alternate Contact Person _____ Title _____ Phone _____ Email _____								
Section 2 - Description of Waste Generated (provide a separate table if required)								
Site Location(s) where Waste is Generated _____								
Shipping Name (Description)	TDG Number	TDG Class	Quantity Generated each Month (L or Kg)	Frequency of Generation				
Section 3 - Waste Management Information								
General Type of Business _____ Source of Waste _____ Hazardous Waste Carrier(s) Used _____ Hazardous Waste Receiver(s) Used _____ Do you have an approved Emergency Response and Spill Contingency Plan?      Yes ___ (attach copy)      No ___								
Section 4 - Certification								
<i>I certify that the information provided on this form is correct, accurate and complete.</i>								
Signature of Contact Person _____ Date (dd/mm/yy) _____ Print Name of Contact Person _____ Title _____ Phone _____ Email _____								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><b>For Department Use Only</b></td> <td style="width: 40%;">Generator Number NUG# _____</td> <td style="width: 20%;">Approved by _____</td> <td style="width: 10%;">Date _____</td> </tr> </table>					<b>For Department Use Only</b>	Generator Number NUG# _____	Approved by _____	Date _____
<b>For Department Use Only</b>	Generator Number NUG# _____	Approved by _____	Date _____					

## APPENDIX 5 – REGISTRATION FORM – HAZARDOUS WASTE CARRIER

A copy of the carrier registration form and users' guide is available by contacting the Department of Environment or by downloading at <http://env.gov.nu.ca/programareas/environmentprotection>.

Instructions				
<ol style="list-style-type: none"> <li>1. The following information must be provided in order to register as a hazardous waste carrier in Nunavut and to obtain a carrier number. Incomplete applications will be returned to the applicant.</li> <li>2. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to <a href="mailto:EnvironmentalProtection@gov.nu.ca">EnvironmentalProtection@gov.nu.ca</a>.</li> <li>3. Use additional pages to provide information as required.</li> <li>4. Applicants should refer to the accompanying users' guide for further assistance on completing the carrier registration form.</li> </ol>				
Section 1 - Identification				
Carrier (Legal Name) _____				
Corporate Address _____				
Site (Dispatch) Address _____				
Principle Contact Person _____			Title _____	
Phone _____			Email _____	
Alternate Contact Person _____			Title _____	
Phone _____			Email _____	
Section 2 - Description of Waste Transported (provide a separate table if required)				
Shipping Name (Description)	TDG Number	TDG Class	Quantity Transported each Month (L or Kg)	Frequency of Transport
Section 3 - Waste Management Information				
Mode of Transport (check all that apply)      Road _____      Rail _____      Marine _____      Air _____				
Hazardous Waste Generator(s) Used _____				
Hazardous Waste Receiver(s) Used _____				
Do you have an approved Emergency Response and Spill Contingency Plan?      Yes _____ (attach copy)      No _____				
Section 4 - Certification				
<i>I certify that the information provided on this form is correct, accurate and complete.</i>				
Signature of Contact Person _____			Date (dd/mm/yy) _____	
Print Name of Contact Person _____			Title _____	
Phone _____			Email _____	
<b>For Department Use Only</b> Carrier Number NUC# _____      Approved by _____      Date _____				

## APPENDIX 6 – REGISTRATION FORM – HAZARDOUS WASTE RECEIVER

A copy of the receiver registration form and users' guide is available by contacting the Department of Environment or by downloading at <http://env.gov.nu.ca/programareas/environmentprotection>.

Instructions				
<ol style="list-style-type: none"> <li>1. The following information must be provided in order to register as a hazardous waste receiver in Nunavut and to obtain a receiver number. Incomplete applications will be returned to the applicant.</li> <li>2. A receiver who operates a commercial business for the purpose of collecting, storing, transferring, treating, recycling or disposing of hazardous waste may be required to register the facility as a hazardous waste management facility. Refer to section 3.2.2 of the <i>Environmental Guideline for the General Management of Hazardous Waste</i> for further information.</li> <li>3. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to <a href="mailto:EnvironmentalProtection@gov.nu.ca">EnvironmentalProtection@gov.nu.ca</a>.</li> <li>4. Use additional pages to provide information as required.</li> <li>5. Applicants should refer to the accompanying users' guide for further assistance on completing the receiver registration form.</li> </ol>				
Section 1 - Identification				
Receiver (Legal Name) _____				
Mailing Address _____			Postal Code _____	
Principle Contact Person _____		Title _____		
Phone _____		Email _____		
Alternate Contact Person _____			Title _____	
Phone _____			Email _____	
Section 2 - Description of Waste Received (provide a separate table if required)				
Site Location(s) where Waste is Received _____				
Shipping Name (Description)	TDG Number	TDG Class	Quantity Received each Month (L or Kg)	Frequency of Acceptance
Attach a brief description of the proposed facility.				
Section 3 - Waste Management Information				
General Type of Business _____				
General Type of Activity _____				
Hazardous Waste Generator(s) Used _____				
Hazardous Waste Carriers(s) Used _____				
Hazardous Waste Management Facilities Used _____				
Do you have an approved Emergency Response and Spill Contingency Plan?      Yes _____ (attach copy)      No _____				
Section 4 - Certification				
<i>I certify that the information provided on this form is correct, accurate and complete.</i>				
Signature of Contact Person _____			Date (dd/mm/yy) _____	
Print Name of Contact Person _____		Title _____		
Phone _____		Email _____		
<b>For Department Use Only</b> Receiver Number NUR# _____ Approved by _____ Date _____				

## APPENDIX 7 REGISTRATION FORM – HAZARDOUS WASTE MANAGEMENT FACILITY

A copy of the management facility registration form and users' guide is available by contacting the Department of Environment or by downloading at <http://env.gov.nu.ca/programareas/environmentprotection>.

Instructions				
<ol style="list-style-type: none"> <li>1. The following information must be provided in order to register as a hazardous waste management facility in Nunavut and obtain a management facility number. Incomplete applications will be returned to the applicant.</li> <li>2. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to <a href="mailto:EnvironmentalProtection@gov.nu.ca">EnvironmentalProtection@gov.nu.ca</a>.</li> <li>3. Use additional pages to provide information as required.</li> <li>4. Applicants should refer to the accompanying users' guide for further assistance on completing the management facility registration form.</li> </ol>				
Section 1 - Identification				
Applicant (Legal Name) _____ Corporate Address _____ Facility Address _____ Principle Contact Person _____ Title _____ Phone _____ Email _____ Alternate Contact Person _____ Title _____ Phone _____ Email _____				
Section 2 - Description of Waste to be Managed (provide a separate table if required)				
Site Location(s) where Waste is Managed _____				
Shipping Name (Description)	TDG Number	TDG Class	Quantity Managed each Month (L or Kg)	Frequency of Acceptance
Attach a complete description of the proposed facility, safety measures, equipment and management processes to be used. Include engineered drawing where applicable.				
Section 3 - Waste Management Information				
General Type of Business (check all that apply)    Receiver of Waste _____    Manage Self-generated Waste _____ Type of Activity (check all that apply)    Collect and Store _____    Transfer _____ Treat _____    Recycle _____    Dispose _____ Hazardous Waste Generator(s) Used _____ Hazardous Waste Carriers(s) Used _____ Do you have an approved Emergency Response and Spill Contingency Plan?    Yes _____ (attach copy)    No _____				
Section 4 - Certification				
<i>I certify that the information provided on this form is correct, accurate and complete.</i> Signature of Contact Person _____ Date (dd/mm/yy) _____ Print Name of Contact Person _____ Title _____ Phone _____ Email _____				
<b>For Department Use Only</b> Management Facility Number NUF# _____ Approved by _____ Date _____				

## APPENDIX 8 - CRITERIA FOR REGISTERING A HAZARDOUS WASTE MANAGEMENT FACILITY

A facility must be registered with the Department of Environment as a hazardous waste management facility where it is used for commercial purposes to store hazardous waste for a period of 180 days or more or the quantity of hazardous waste<sup>1</sup> stored on-site at any one time exceeds the criteria established in the following table. Where the facility is to be used for the treatment, recycling or disposal of hazardous waste, the facility must be registered as a hazardous waste management facility where the quantity treated, recycled or disposed of each month exceeds a 'small quantity'<sup>2</sup>.

	Description	Quantity <sup>3</sup> (Kg or L)
Class 1	Explosives	50
Class 2	Division 2.1 – Flammable Gases	500 <sup>4</sup>
	Division 2.2 – Non-flammable and Non-toxic Gases	5000 <sup>4</sup>
	Division 2.3 – Poison Gases	200 <sup>4</sup>
Class 3	Flammable Liquids	4000
Class 4	Division 4.1 – Flammable Solids	5000
	Division 4.2 – Spontaneously Combustible	1000
	Division 4.3 – Water Reactive	500
Class 5	Division 5.1 – Oxidizing Substances	1000
	Division 5.2 – Organic Peroxides	50
Class 6	Division 6.1 – Toxic Substances	1000
	Division 6.2 – Infectious Substances	500 <sup>4</sup>
Class 7	Radioactive Materials	Any amount
Class 8	Corrosives	1000
Class 9	Miscellaneous	1000
	PCB Materials	50
	Environmentally Hazardous Substance Solid – UN3077	5000
All Classes	Total Aggregate Quantity	5000

1. Applies to hazardous waste only and not to dangerous goods.
2. Small quantity means hazardous waste that is generated in an amount that is less than five kilograms per month if a solid or less than five litres per month if a liquid, and where the total quantity accumulated at any one time does not exceed five kilograms or five litres. This does not include hazardous waste that is mercury or Class 2.3, 5.1 or 6.1 materials. These wastes must be generated in an amount that is less than one kilogram per month if a solid or less than one litre per month if a liquid, and where the total quantity accumulated at any one time does not exceed one kilogram or one litre.
3. Quantity applies to solids when expressed in kilograms (kg) and liquids when expressed in litres (L).
4. Total liquid capacity of the container.

# APPENDIX 9 – HAZARDOUS WASTE MANIFEST

## MOVEMENT DOCUMENT / MANIFEST DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement document/manifest conforms to all federal and provincial transport and environmental legislation.  
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur le transport et l'environnement.

SAMP 000001

Movement Document / Manifest Reference No.  
N° de référence du document de mouvement/manifeste

<b>A Consignor / consigneur</b> Producteur / expéditeur N° d'identification - dtd. provincial		<b>B Carrier / transporteur</b> N° d'identification - dtd. Provincial		Reference No. of other movement document(s) used / N° de référence du autre(s) documents de mouvement/manifeste utilisé(s)										
Company name / Nom de l'entreprise Mailing address / Adresse postale City/Ville Province Postal code / Code postal E-mail / Courriel électronique Tel. No. / N° de tél. ( ) Shipping site address / Adresse de lieu de l'expédition City/Ville Province Postal code / Code postal		Company name / Nom de l'entreprise Mailing address / Adresse postale City/Ville Province Postal code / Code postal E-mail / Courriel électronique Tel. No. / N° de tél. ( ) Vehicle / Véhicule Trailer - Flat car No. 1 / Wagon - Voiturette Registration No. / N° d'identification Prov. # Trailer - Flat car No. 2 / Wagon - Voiturette		<b>C Receiver / consignee</b> Réceptionnaire / destinataire N° d'identification - dtd. Provincial Shipping / consignee information same as in Part A Les renseignements du réceptionnaire / destinataire est le même qu'en A <input type="checkbox"/> Yes/Oui <input type="checkbox"/> No/Non (check the box below) / Oui, compléter le cas ci-dessous Company name / Nom de l'entreprise Mailing address / Adresse postale City/Ville Province Postal code / Code postal E-mail / Courriel électronique Tel. No. / N° de tél. ( ) Receipt site address / Adresse de lieu de destination City/Ville Province Postal code / Code postal										
Intended Receiver / consignee Réceptionnaire / destinataire prévu Mailing address / Adresse postale City/Ville Province Postal code / Code postal E-mail / Courriel électronique Tel. No. / N° de tél. ( ) Receipt site address / Adresse de lieu de l'expédition City/Ville Province Postal code / Code postal		Port of entry / Port d'entrée International country / Pays international Port of exit / Port de sortie International country / Pays international Carrier Certification to certify that hazardous waste is regulated material from the generator / consignee Attestation de l'expéditeur / consigneur au sujet de la PSE et que l'information contenue dans Part B est complète et correcte Assureur de l'expéditeur / destinataire, j'atteste avoir reçu les déchets de matières dangereuses de producteur / expéditeur, arrivé à leur destination en respectant les conditions, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets. Name of authorized person (print) / Nom de l'agent autorisé (caractères d'impression): Tel. No. / N° de tél. ( ) Year / Année Month / Mois Day / Jour Signature:		Date received / Date de réception Year / Année Month / Mois Day / Jour Time / Heure A.M. P.M. If waste or recyclable material to be transferred, specify intended company name. If the déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire. N° d'identification dtd provincial										
PSE code Code PSE	Shipping name Appellation réglementaire	Class / Classe Sub-class / Sous-classe	UN No. N° UN	Packing / type of or description de l'emballage	Quantity shipped Quantité expédiée	Units Unités	Package No. / N° Code	Country Pays	Quantity received Quantité reçue	Units Unités	Comments Commentaires	Handling Code / Code de manutention	Shipped / Invoiced Expédié / Facturé	Pack. / Vols Cont. / Mds
Volume No. N° de notification	Motion Line No. N° de ligne de notification	Shipment Event	CI / Di	D or R code Code D ou R	C code Code C	State / Province Code du Code CCCC	Y code Code Y	National code in country of / Code du pays d'origine Export / Import	Customs code(s) Code(s) de douane	Handling code "Other" (specify) Si code de manutention - autre - (spécifier)	Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. Attestation de l'expéditeur / destinataire: J'atteste que l'information contenue dans la partie C est exacte et complète. Name of authorized person (print) Nom de l'agent autorisé (caractères d'impression) Signature Tel. No. / N° de tél. ( )	Special handling / Manutention spéciale <input type="checkbox"/> Attached / Ci-joint <input type="checkbox"/> As follows / Ci-dessous:	Date shipped / Date d'expédition Year / Année Month / Mois Day / Jour Time / Heure A.M. P.M. Scheduled arrival date / Date d'arrivée prévue Year / Année Month / Mois Day / Jour	

Alberta Environment (2007)

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## APPENDIX 10 - WASTE EXCHANGES AND ASSOCIATIONS

The concept of exchanging waste began in Canada in the 1980s. It involves the transfer of unwanted, overstocked, obsolete, damaged, contaminated or post-dated material and waste to another company or person who would reuse it. Various waste exchanges and associations have been established in Canada to facilitate these transfers. Several, but not all, waste exchanges and associations are listed below.

Northern Territories Water and Waste Association  
201, 4817- 49 Street  
Yellowknife, Northwest Territories X1A 3S7  
(867) 873-4325  
<http://www.ntwwa.com>

Recycling Council of British Columbia  
Unit #10, 119 West Pender Street  
Vancouver, British Columbia V6B 1S5  
(604) 683-6009  
<http://www.rcbc.bc.ca>

Alberta Waste Materials Exchange  
Building #350, 6815 Eighth Street NE  
Calgary, Alberta T2E 7H7  
(403) 297-7505

Calgary Materials Exchange  
809 Fourth Avenue NE  
Calgary, Alberta T2P 0K5  
(403) 230-1443  
<http://www.cmex.ca>

Saskatchewan Waste Materials Exchange  
515 Henderson Drive.  
Regina, Saskatchewan S4N 5X1  
(306) 787-9800

Manitoba Waste Exchange  
1329 Niakwa Road  
Winnipeg, Manitoba R2J 3T4  
(204) 257-3891

Ontario Waste Exchange  
OCETA 63 Polson Street, 2nd floor  
Toronto, Ontario M5A 1A4  
(416) 778-4199  
<http://www.owe.org>

Canadian Waste Materials Exchange  
2395 Spearman Drive  
Mississauga, Ontario L5K 1B3  
(416) 822-4111

Canadian Chemical Exchange  
900 Blondin  
Ste-Adele, Quebec J0R 1L0  
(450) 229-6511  
<http://www.stobec.com>

Quebec Waste Materials Exchange  
14 Place du Commerce, Bureau 350  
Le-des-Squeurs, Quebec H3E 1T5  
(514) 762-9012

## APPENDIX 11 – GOVERNMENT CONTACTS

### Government of Nunavut

Environmental Protection Division  
Department of Environment  
Inuksugait Plaza  
P.O. Box 1000, Station 1360  
Iqaluit, Nunavut X0A 0H0  
Telephone: (867) 975-7729 Fax: (867) 975-7739

Motor Vehicles Division  
Department of Economic Development and  
Transportation  
P.O. Box 10  
Gjoa Haven, Nunavut X0B 1J0  
Telephone: (867) 360-4615 Fax: (867) 360-4619

Workers' Safety and Compensation Commission  
P.O. Box 669  
Baron Building/1091  
Iqaluit, Nunavut X0A 0H0  
Telephone: 1-877-404-4407 (toll free) Fax: 1-866-  
979-8501

Department of Community and Government  
Services (all Divisions)  
P.O. Box 1000, Station 700  
4th Floor, W.G. Brown Building  
Iqaluit, Nunavut X0A 0H0  
Telephone: (867) 975-5400 Fax: (867) 975-5305

Office of Chief Medical Health Officer of Health  
Department of Health and Social Services  
P.O. Box 1000, Station 1000  
Iqaluit, Nunavut X0A 0H0  
Telephone: (867) 975-5774 Fax: (867) 975-5755

### Government of Canada

Indian and Northern Affairs – Nunavut Region  
P.O. Box 2200  
Iqaluit, Nunavut X0A 0H0  
Telephone: (867) 975-4500 Fax: (867) 975-4560

Environment Canada (NWT and Nunavut)  
5019 52nd Street  
Yellowknife, Northwest Territories X1A 1T5  
Telephone: (867) 669-4730 Fax: (867) 873-8185

Department of Transport – Road, Rail, Marine, Air  
P.O. Box 8550  
344 Edmonton Street  
Winnipeg, Manitoba R3C 1P6  
Telephone: 1-888-463-0521 (toll free)  
Fax: (204) 983-8992 Road, Rail and Marine only  
Fax: (204) 983-1734 Air only

# Appendix **D**

## **Environmental Guideline for the General Management of Hazardous Waste**





# End-of-Life Vehicle Hazardous Materials Recovery Program Manual

*Manual for the Preparation and  
Disposal of End-of-Life Vehicles in  
Nunavut*

*Final Report*

*January 2011*

Government of Nunavut

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## **1 INTRODUCTION**

In 2004 the Government of Nunavut identified the disposition of End of Life Vehicles (ELVs) as a priority issue. The Departments of Environment (GN-DoE), Economic Development and Transportation and Community and Government Services were directed to initiate a pilot program to repatriate End-of-Life Vehicles (ELVs) to the south. A project was initiated at Iqaluit which resulted in the processing of approximately 3,600 tonnes of scrap metal.

Throughout the project, the GN-DoE had concerns with respect to the environmental impacts of the operation; specifically with respect to the hazardous materials present in the ELVs. Not having any previous experience with vehicle crushing operations put the Department at a disadvantage in terms of being able to direct the operators to conduct their activities in accordance with nationally and industry-accepted standards for vehicle crushing and bailing operations. It was decided that there is a need for an environmental manual to capture such operations in Nunavut.

The purpose of this manual is to provide Municipal Solid Waste (MSW) facility and other operators with a guide for the proper removal, storage and handling of potential hazardous materials from ELVs. This removal will allow these ELVs to be safely stored prior to ultimate removal of ELVs from Nunavut communities.

ELV recycling programs exist across Canada; however, due to their remote locations communities in Nunavut have limited access to these programs. By training local community staff to properly handle and prepare ELVs for shipping and recycling, more of these items can be removed from communities. Removal of these items has both environmental and aesthetic benefits, contributes to overall organization of the community and increases the available landfill capacity.

Information provided in this manual has been compiled from numerous sources including:

- The National Code of Practice for Automotive Recyclers Participating in the National Vehicle Scrappage Program.
- Department of Sustainable Development, Government of Nunavut.
- Summerhill Impact “Switch Out” Program.
- British Columbia Ministry of Environment’s “Guidebook for the Vehicle Dismantling and Recycling Industry Environmental Planning Regulation”.
- Interviews with automotive recyclers.

## **2 BACKGROUND**

As part of the Government of Nunavut's objective of INUUQATIGIITTIARNIQ: HEALTHY COMMUNITIES, the Department of Environment was directed to initiate a pilot program that looked into the task of dismantling ELVs and removing them from Nunavut communities (Department of Environment, Government of Nunavut, 2006). This program has begun in Iqaluit where a pilot project to crush and remove ELVs from the city has been in progress since 2008. ELVs were collected, crushed on-site and then prepared for shipment to southern recycling and disposal facilities. Shipment of crushed and prepared vehicles to southern facilities is planned for the summer of 2010.

Other communities have also benefited from similar pilot projects. During the summer of 2004 and 2005, a pilot project to removed scrap metal and vehicles from Rankin Inlet was implemented. The pilot project was able to remove 106 tons of scrap metal from the community. The completion of the pilot project led the community to begin formation of the Rankin Inlet Salvage Company, established to create income to sustain the scrap metal recycling program once the pilot project was complete (North Central Development, 2006).

There are a number of hazardous materials found in vehicles that should be removed from ELVs prior to crushing or further processing. Some of these materials include gasoline, engine oil, fluids (transmission, brake, power steering, etc.), batteries, mercury switches and refrigerants. If these items are not removed prior to crushing the ELVs, these materials may be disbursed into the surrounding environment. According to the Ontario Automotive Recyclers Association (OARA) (reference found in VT Solid Waste Districts and Alliances, 2002), the amount of fluids to be removed is estimated at around 5 US gallons per vehicle. The following table shows the break down of fluids per type as estimated by the OARA:

**Table 1: Estimated Amount of Fluids per Vehicle (OARA)**

<b>Fluid Type</b>	<b>US Gallons per Vehicle</b>	<b>Litres</b>
Fuel	2.70	10.2
Engine Oil	0.96	3.6
Coolant	0.73	2.8
Transmission Oil	0.34	1.3
Steering Gear Oil	0.20	0.8

The main purpose of this manual is to provide Municipal Solid Waste (MSW) facility and other operators with a guide for the proper removal, storage and handling of potential hazardous materials from ELVs. This removal will allow these ELVs to be safely stored prior to ultimate removal of ELVs from Nunavut communities. A section has also been incorporated to cover dismantling of waste appliances as some of the dismantling requirements for waste appliances are similar to those of ELVs.

### **3 SCRAP VEHICLE AND METAL RECOVERY OPERATION**

#### **3.1 Required Equipment**

The following is a recommended list of equipment that would be required to operate an ELV dismantling facility in Nunavut:

- Secured building with garage bay style door, concrete floor, adequate roof and no drains leading to a sewer, sewage tank or stormwater collection system (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008). Alternate for smaller locations is to undertake work outdoors in dry warm weather only upon an impermeable working surface. The constructed vehicle fluid recovery area should consist of, for example, a protective sand layer/poly liner/sand layer covered with a plywood working surface.
- Forklift or other heavy machinery to move ELVs from receiving area to dismantling area and then from dismantling area to vehicle hulk storage area.
- Gasoline evacuation pump with filter.
- Small wheel hoists to lift car high enough to drain fluids.
- Small hand pumps for removal of engine oil, transmission fluid, gear oil, coolants and brake fluid.
- Containers for storage of oils, antifreeze, windshield washer fluid, etc.
- Portable refrigerant removal device with separate storage tanks for each type of refrigerant.
- Drip pans to catch fluids.
- Spill kit to clean up spills.

#### **3.2 Training Requirements**

The main training requirements for employees working at an ELV recycling facility are:

- Proper collection, handling, storage and disposal of hazardous materials.
- Spill prevention and control procedures.
- Certification to remove and store refrigerants from vehicles.

All personnel who work at the facility must have proper training in handling and storing hazardous materials and must follow the procedures set out for the facility. Each facility will be operated according to methods specific to that facility and will be based on available equipment, personnel, shipping schedules and number of ELVs to be processed. The employer should ensure that each employee is trained in the hazardous waste handling and spill response procedures set out specifically for their operation. Please refer to Section 4 for specific handling procedures with regards to hazardous materials.

Removal of refrigerants (i.e. Freon), must be completed by a certified technician. According to the Department of Sustainable Development, Government of Nunavut (2002), a certified service technician is:

*“A technician who is otherwise qualified to service ODS containing equipment and has successfully completed an environmental awareness course for ozone depleting substances certified by Environment Canada.”*

Further training of employees is required if the facility requests to take part in the National Vehicle Scrapage Program. In order to register with the program, employees of the facility must attend a training session provided by the program. This training session may be completed in person or online (National Code of Practice, 2008).

### **3.3 Administrative Requirements and Record Keeping**

Administrative record keeping is essential in the operation of the ELV facility. Based on the National Code of Practice (2008) and British Columbia Ministry of Environment (2008), records must be kept on-site and include the following items:

- Transportation and manifest records from licensed hazardous waste transporters of all hazardous wastes transported. Records should be identified by a manifest number and invoice number and should be kept in a central filing location (kept on-site i.e Community Public Works office, a minimum of two years).
- Copy of the most up-to-date transporters' licence that allows them to transport all hazardous wastes with respect to ELVs.
- Records of staff members qualified to remove refrigerants (must be kept on-site a minimum of two years).
- Records created by qualified refrigerant removal technicians that tested and removed refrigerants from ELVs (kept on-site a minimum of two years).

The following plans and procedures (based on the National Code of Practice (2008) and British Columbia Ministry of Environment (2008)) should also be kept on-site and accessible to all employees:

- Detailed spill response plan and procedures.
- Standard operating procedures that have been developed specifically for the facility.
- Safety and environmental policies and procedures.
- Environmental Management Plans and audit reports.

### **3.4 Recycling and Processing Areas**

According to the National Code of Practice (2008), recycling of ELVs will require space for six (6) different processing activities. These activities include:

- Accepting and storing ELVs.
- Removal of hazardous fluids and wet parts (if required).
- Storing ELV carcasses once wet parts and fluids have been removed.
- Storing hazardous fluids removed from ELVs.
- Storing wet parts removed from ELVs.
- Crushing ELV carcasses (if the site is equipped to complete this activity).

The following sections describe the site requirements for each activity.

#### *3.4.1 Accepting and Storing ELVs and Waste Appliances*

The ELV and appliance processing facility must have a space dedicated to storing and inspecting vehicles when they arrive on site. Based on the National Code of Practice (2008), there is no requirement for this area to be paved. However all spills must be cleaned up and any contaminated soils and cleaning materials must be disposed of as hazardous waste, unless materials are tested and shown not to be hazardous. Vehicles should be checked for leaks as they arrive to prevent soil and water contamination in the vehicle storage area. Runoff from the storage area caused by precipitation (rain, snow, etc.) must not be contaminated (National Code of Practice, 2008). Methods to collect and treat runoff may be required. This may include obtaining a water licence for the facility from the Nunavut Water Board.

#### *3.4.2 Dismantling Vehicles and Appliances and Removing Hazardous Materials*

Vehicles must be drained of all hazardous fluids prior to crushing the vehicle hulk. Wet parts are parts of the vehicle that contain hazardous fluids such as batteries, fuel tanks, transmissions, radiators and power steering units. Also parts that are leaking fluid, need to be treated as wet parts and their fluids removed.



**Figure 1: Vehicle Ready for Dismantling**

All hazardous fluids must be removed from ELVs and disposed appliances before safe storage or crushing. If these materials are not removed, hazardous materials may be released into the crushing zone thus contaminating the surrounding area or leaked into the environment during shipping. To ensure safe removal of all hazardous items, the vehicle's battery should be removed first, followed by refrigerants (if present) and thirdly fuel. The order of removal thereafter is not significant. Hazardous items that must be removed include:

- Battery
- Refrigerants
- Gasoline or Diesel
- Antifreeze
- Brake Fluid
- Engine Oil
- Transmission Fluid
- Power Steering Fluid

- Differential Fluid (if present)
- Windshield Washer Fluid
- Ballasts and Capacitors
- Mercury Switches (found in ABS brakes, convenience lighting)
- Lead (battery connectors, wheel weights)

Please refer to Section 4 for proper handling and storage techniques for the listed hazardous materials.

The space used for dismantling vehicles and appliances should have a non-permeable base, such as concrete or poly liner, to provide an easy cleaning surface and to prevent spilled fluids from contaminating the environment. The space should be covered to protect it from the weather and to prevent spilled materials from being washed into the environment. The concrete pad should be high enough to prevent flooding during rainstorm events. An alternate for smaller/temporary locations is to undertake work outdoors in dry warm weather only upon an impermeable working surface. The constructed temporary vehicle fluid recovery area should consist of, for example, a protective sand layer/poly liner/sand layer covered with a plywood working surface. Absorbent materials should be on hand at all times to clean up any spills. All spills must be cleaned up and any contaminated soils and cleaning materials must be disposed of as hazardous waste, unless materials are tested and shown not to be hazardous.



**Figure 2: Absorbent Material place over Spilled Vehicle Fluids**

### *3.4.3 Storage of Vehicle and Appliance Carcasses*

Once all hazardous materials have been removed, there must be an area designated for the storage of vehicle and appliance hulks. Hulks may be salvaged for useable or recyclable parts. Once the hulks have no more “salvage” value, they may be crushed and shipped south for recycling.



**Figure 3: Vehicle Hulks Ready to be Crushed**

The vehicle and appliance hulk storage area must be kept clean and any spills or leaks must be cleaned up immediately. Contaminated soil and materials must be discarded as hazardous wastes, unless tested and determined to be non-hazardous. Care must be taken not to contaminate any water or runoff from the area (National Code of Practice, 2008).

### *3.4.4 Storage of Hazardous Fluids*

Hazardous fluids must be stored in proper containers and separated appropriately. These containers should be kept in the vehicle dismantling area, stored on the concrete pad. This will provide easy access to the containers when draining fluids from vehicles. Storing in this area will also provide protection from the weather and a non-permeable surface to store the containers on. Fuels must be stored in a separate well-ventilated area of a building or outdoors protected from the weather (British Columbia Ministry of Environment, 2008). Contact the Fire Marshall for specific instructions on the storage of fuels. Please refer to Section 4 for proper handling and storage techniques for each hazardous material.



**Figure 4: Example of Plastic Totes Used for Collection of Vehicle Fluids - Not Used for Gasoline**

#### *3.4.5 Crushing Area for ELV and Appliance Hulks*

Crushing of vehicles and appliances is intended to reduce the volume for shipping. Crushing may consist of flattening an auto or logging. Logging an auto consists of compressing an auto into a rectangular cube. A crusher may be brought to site and operated by a third-party when quantity of hulks warrant. If so, the crushing area must be large enough to accommodate the crusher and also have a space designated for the storage of crushed vehicles. According to the National Code of Practice (2008) and the British Columbia Ministry of Environment (2008), the following items should be completed in conjunction with crushing operations:

- All hazardous materials must be removed from the vehicles prior to crushing.
- Any spills must be cleaned up immediately and all contaminated soil and cleaning materials must be disposed of as hazardous waste (unless tested and shown otherwise).
- Any water resulting from the crushing operations should be treated through oil absorbent filters.
- Once the crusher has been removed from site, the site should be cleaned and debris removed to landfill.



**Figure 5: Vehicle Crusher in Operation**



**Figure 6: Example of "Logged" Metal**

### **3.5 Site Security**

Site security is very important. ELV processing operations may become targets for vandalism and theft and may lead to injury or environmental contamination. Therefore, it is extremely important to keep all equipment locked and inaccessible to the public. Hazardous materials and vehicle dismantling equipment should be stored in a secured location. Any machinery such as the crushing equipment should be locked and tagged out at the end of each day to prevent injury as well as stored in a secured location.

## **4 COLLECTION, STOCKPILING AND DISPOSAL OF HAZARDOUS ITEMS**

All hazardous fluids must be removed from ELVs before safe storage or crushing. If these materials are not removed, hazardous materials may be released during storage or crushing or leaked into the environment during shipping. To ensure safe removal of all hazardous items, the battery should be removed first, followed by refrigerants (if present) and thirdly fuel. The order of removal thereafter is not significant. Hazardous items that must be removed include:

- Battery
- Refrigerants
- Gasoline or Diesel
- Antifreeze
- Brake Fluid
- Engine Oil
- Transmission Fluid
- Power Steering Fluid
- Differential Fluid (if present)
- Windshield Washer Fluid
- Mercury Switches (found in ABS brakes, convenience lighting)

### **4.1 Waste Batteries**

#### *4.1.1 Collection*

A vehicle's battery should be removed in order to de-energize the ELV. This will allow the safe removal of all other materials. Waste batteries from ELVs contain corrosive fluids and heavy metals that may contaminate the environment if not stored and disposed properly (Department of Sustainable Development, Government of Nunavut, 2002). Therefore, all waste batteries from ELVs must be removed during the dismantling process.



**Figure 7: Removing Battery from Vehicle**

#### *4.1.2 Stockpiling*

Waste batteries should be stored in a leak-proof drum (metal or plastic) with a secured lid to protect batteries from rain and snow. Batteries may be stacked, but a layer of cardboard or plywood must be placed between the layers of batteries. If batteries are stacked without cardboard or plywood between the layers, there is the potential for the batteries to short and cause an electrical fire. The batteries must be secured to the pallets by nylon straps and must not be stacked more than two batteries high. A polyethylene containment liner must be used and must be large enough to place under the batteries and then wrap around them to create a sealed containment unit (Department of Sustainable Development, Government of Nunavut, 2002).



**Figure 8: Batteries Not Correctly Stored**

#### *4.1.3 Disposal*

Waste batteries may be sent to recycling facilities in southern Canada. The ELV operator will have to contact a recycling/disposal facility and make arrangements for that facility to receive the waste batteries. Please contact the appropriate transport authority (marine, rail, road) for appropriate shipping and transportation instructions of waste batteries (Department of Sustainable Development, Government of Nunavut, 2002). Ensure that manifests and transportation records are kept on-site.

## **4.2 Refrigerants**

### *4.2.1 Collection*

Refrigerants should be removed after the battery has been removed and prior to removal of any other fluids or items from ELVs. This is to prevent an accidental release of refrigerants into the atmosphere.

Removal of refrigerants must be performed only by a certified technician. Technicians must use an approved portable refrigerant recovery unit to remove refrigerants from ELVs. They must also record the amount of refrigerant removed per vehicle. Once refrigerants have been removed, the technician must clearly label each vehicle as such (British Columbia Ministry of Environment, 2008).

#### 4.2.2 Stockpiling

Refrigerants must be stored in approved, refillable storage containers. They must not be vented to the atmosphere. Storage containers must be properly labelled and should be replaced or hydrostatically tested every five (5) years (British Columbia Ministry of Environment, 2008).



**Figure 9: Refrigerant Evacuation Unit**

Records of all refrigerants removed from ELVs must be maintained on-site. Records should contain the amount of refrigerant removed from each vehicle, the date it was removed, name of the certified technician who performed the recovery, registration number of the certified technician, whether the technician performed the service as an employee or agent of the business and the name of the business responsible for removal of refrigerant (British Columbia Ministry of Environment, 2008).

#### 4.2.3 Disposal

Waste refrigerant from vehicles can be disposed of through the Refrigerant Management Canada™ program on a fee basis. This program was set up to safely collect and destroy refrigerant compounds without releasing them into the atmosphere. For more information on the program or for contact information on coordinating disposal of waste refrigerants please contact an RMC Collection Service Provider. Contact information for providers can be found on the Refrigerant Management Canada™ website: <http://www.refrigerantmanagement.ca/index.php>.

### 4.3 Waste Fuel

#### 4.3.1 Collection

Waste fuel pertains to fuels such as gasoline and diesel. These fuels should be collected and stored separately in dedicated containers or transferred to other vehicles on-site. Fuels that are still usable (i.e. gasoline that has not gone stale) may be used in on-site vehicles. Stale gasoline cannot be used in vehicles as it may cause damage and must be handled and disposed of as a hazardous waste (British Columbia Ministry of Environment, 2008). Stale gasoline can often be identified by a bad smell caused by degradation of the fuel.

Gasoline can be dangerous as it is flammable and may catch on fire or explode if it comes into contact with a spark or ignition source. Gas should be removed in a well ventilated area and stored outside of the dismantling area. Remove gas using a suction system specifically designed for the removal of gasoline. Do not use a plastic hand pump as this may cause a build up of static electrical charge and may lead to fire or explosion. Do not puncture holes in a tank to drain gasoline or diesel; this may result in leaks or spills (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008).



**Figure 10: Example of Gasoline Collection System**

#### *4.3.2 Stockpiling*

Usable fuel may be stored in storage containers approved for the specified type of fuel and reused in on-site vehicles. These containers must be kept outside of the dismantling area to prohibit fume build-up and decrease the risk of fire. Stale gasoline and waste fuel must also be stored in approved containers outside of the dismantling area and must be labelled as waste/unusable fuels. Secondary containment should be provided. If stored outdoors, these containers should be protected from rain and snow.

#### *4.3.3 Disposal*

Usable fuel should be reused where possible to decrease the amount of waste fuels to be transported offsite. This will decrease shipping and disposal costs. Waste fuels and stale gasoline must be collected and transported off site. The most effective method to transporting out of the community will be by annual barge. These fuels will need to be transported off site by a licensed Transportation of Dangerous Goods shipper. Arrangements will have to be made with the barge company to complete the appropriate manifests and have the approved packaging for transportation offsite. Records of manifests must be kept on-site for a minimum of two years.

### **4.4 Waste Oils and Fluids**

#### *4.4.1 Collection*

Waste oils found in ELVs include: engine oil; transmission, power steering, and brake fluids; and differential oil. According to the National Code of Practice (2008), brake, transmission and power steering fluids may be mixed with waste oil. However, based on information from Yukon Environment (2005) and Missouri Department of Natural Resources (1997), brake fluid may sometimes be included, however, due to chlorinated compounds that may be found in some brake fluids, it is recommended that brake fluid not be mixed with waste oils. Please refer to Section 4.5 for further information.

It is recommended that brake fluid be collected with a dedicated pump and stored separately from other oils. Other oils i.e. engine, transmission, power steering and differential can be collected using a common pump and stored in a mixed oil container. Brake fluid should be tested when the container is full to determine chlorinated content and end disposal.

Waste oils can be collected by draining from the vehicle components or by using a hand pump. When draining, use a drip pan to collect the fluids. Once all the fluid has been drained from the component, replace the drain plug, empty the fluid into the designated and marked storage container. For differentials, replace all removed bolts to prevent leakage.



**Figure 11: Using Drip Pans to Catch Draining Fluids**

When using a hand pump to remove fluids, ensure that each fluid (aside from oils such as engine, transmission, power steering and differential) has a dedicated hand pump. Do not use the same hand pumps for brake fluid, antifreeze, windshield washer fluid, etc. Once all fluid has been drained, empty the container of each pump directly into the designated storage container.



**Figure 12: Using Hand Pump**

#### *4.4.2 Stockpiling*

Waste oil may be stored in steel drums or plastic containers. Both types of containers must have proper fitting lids. These containers may be kept in the dismantling area within a secondary containment unit. According to the British Columbia Ministry of Environment (2008), steel drums are recommended over plastic containers as plastic tends to degrade over time and could potentially cause a leak or spill.



**Figure 13: Example of Plastic Container Used for Storage of Waste Oils**



**Figure 14: Example of Steel Drum Used for Storage of Waste Fluids**

#### *4.4.3 Disposal*

Waste oil can be disposed of in different ways, however the most appropriate disposal methods for Nunavut include transportation to a recycling facility or used as fuel in a waste oil furnace. Transporting to a recycling facility will involve shipping waste oil out of the community on the annual barge. Hazardous waste/recyclable manifests will need to be completed.

Use of waste oil as a fuel in an approved furnace will eliminate the need to ship waste oil to a southern recycling facility. Waste must only be transported to an approved user/recycler of waste oil.

### **4.5 Brake Fluid**

#### *4.5.1 Collection*

Brake fluid may be collected using a hand pump as described for the collection of waste oils. The fluid should then be disposed of into a container designated specifically for brake fluid.

Depending on the end disposal methods of the collected waste oil, brake fluid should not be mixed with waste oil as it may contain chlorinated compounds. Chlorinated compounds when burned in a waste oil burner may cause smoke, fumes or problems with the waste oil burner (Yukon Environment, 2005 and Missouri Department of Natural Resources, 1997). According to the Missouri Department of Natural Resources (1997), brake fluids may contain chlorinated compounds if:

1. An older brake fluid manufactured using chlorinated compounds was used; or,
2. It had become contaminated from brake cleaners that contain chlorinated compounds.

To be sure, the ELV facility operator may want to use a test kit to determine whether or not the used brake fluid contains chlorinated compounds. The facility operator will have to contact the waste oil recycler/disposal company to determine if they will accept waste oil mixed with brake fluid that may contain chlorinated compounds (Missouri Department of Natural Resources, 1997).

#### *4.5.2 Stockpiling*

Brake fluid may be stockpiled in approved clearly labelled containers until it can be shipped out by barge. Waste brake fluid should be kept separate from other waste oils unless the ELV facility operator has contacted the recycling/disposal company and has confirmed with them that adding brake fluid to the waste oil is acceptable.

#### *4.5.3 Disposal*

Waste brake fluid must be shipped out of the community by annual barge by a licensed Transportation of Dangerous Goods shipper. Brake fluid must be sent to a proper disposal/recycling facility and arrangements with the facility to accept brake fluid must be made prior to shipping.

## **4.6 Antifreeze**

### *4.6.1 Collection*

Antifreeze may be collected by using a hand pump to remove it from the ELV. It must be stored in a clearly marked steel drum or plastic container and must not be mixed with other waste fluids such as oils, windshield washer fluid, brake fluid, etc. Water contaminated by antifreeze must not be put through an oil/water separator as a method of treatment. Oil/water separators do not remove antifreeze from water and if discharged through an oil/water separator the antifreeze may be released into the environment (British Columbia Ministry of Environment, 2008).

### *4.6.2 Stockpiling*

Waste antifreeze must be stored in an appropriate container with a secure lid. Store containers within a secondary containment area that does not have a drain, thereby preventing the release of antifreeze into the environment. Antifreeze that is reusable can be used within other operating vehicles (British Columbia Ministry of Environment, 2008). Unusable antifreeze must be kept separate and stored until it can be shipped out of the community.

### *4.6.3 Disposal*

Antifreeze must not be disposed into the environment as it is toxic and may contaminate the soil and water. It must be stockpiled until it can be shipped to a proper disposal facility. Transportation and manifest records of shipments of waste antifreeze must be kept on-site for a minimum of two years (British Columbia Ministry of Environment, 2008).

## **4.7 Windshield Washer Fluid**

### *4.7.1 Collection*

Windshield washer fluid is a toxic substance that must be drained from all ELVs prior to crushing. Remove washer fluid from ELVs by using a dedicated hand pump and draining the fluid into a dedicated container. Do not mix with other fluids such as engine oil, antifreeze, brake fluid, transmission fluid, etc. Sell or give away reusable washer fluid for use in other operational vehicles.

#### *4.7.2 Stockpiling*

Washer fluid must be stored in an appropriate container with a secure lid. Store containers within a secondary containment, area that does not have a drain in order to prevent the release of washer fluid into the environment. Most washer fluid is reusable and can be used within other operating vehicles (British Columbia Ministry of Environment, 2008). Unusable washer fluid must be kept separate and stored until it can be shipped out of the community.

#### *4.7.3 Disposal*

Waste washer fluid must not be disposed into the environment as it may be toxic. It must be stockpiled until it can be shipped to a proper disposal facility. Transportation and manifest records of shipments of waste fluid must be kept on-site for a minimum of two years.

### **4.8 Mercury Switches**

#### *4.8.1 Collection*

The Mercury Switch Out Program is a program that was developed to help automotive recyclers and dismantlers remove and dispose of mercury switches safely from ELVs, when an ELV dismantling facility registers with the program. Clean Air Foundation staff will send to the facility training and educational materials, a collection container for the mercury switches and a pre-paid waybill to send the container back once it is full.

All mercury switches must be removed from ELVs prior to crushing the vehicle hulks. Mercury switches can be found in trunks, hoods, convenience lighting and anti-lock braking systems. Not all vehicles have the same number of mercury switches and not all switches are found in the same locations in each vehicle. The Mercury Switch Out Program website has a number of resources to help ELV facility operators locate mercury switches in various vehicle models and step by step instructions on how to remove these switches. For each convenience light location, the following general steps must be taken:

- Locate the lighting assembly under the vehicle trunk and/or hood.
- Remove any fasteners to separate the entire lighting assembly from the vehicle.
- Break open the lighting assembly to expose the mercury switch capsule (a sealed metal pellet). Small flathead screwdrivers and wire cutters are often the only tools that are required.
- Remove the mercury switch capsule (using a small screwdriver) and place it in the *Switch Out* collection container. Replace the lid on the container. The remaining plastic/metal from the lighting assembly can be disposed of with regular waste.

On vehicles with ABS breaking systems, the following general steps must be taken:

- Locate the ABS G-Force sensor module on the vehicle. Module locations include: the drive tunnel, below the rear seat on the floor pan, on the right front wheel apron, and on the left frame rail right below the driver.
- Remove the ABS G-Force sensor module and place the entire sensor module in the *Switch Out* collection container. Replace the lid on the container. **NOTE:** The ABS G-Force sensor module contains either two or three mercury switch capsules embedded in the casing. Do not attempt to remove the mercury switch capsules from the sensor module.

Please refer to the Mercury Switch Out Program website at <http://www.switchout.ca/> for further information.



**Figure 15: Example of Removing Light Assembly Containing a Mercury Switch**



**Figure 16: Mercury Pellet removed from Vehicle Convenience Light**

#### *4.8.2 Stockpiling*

Once the mercury switches have been removed from each unit, they should be stored in the plastic container provided by the Mercury Switch Out Program. Most of the mercury found in these switches is contained within a metal capsule and therefore the likelihood of a spill is relatively low. However, should a metal capsule break, refer to the Switch Out Clean-Up Instructions located on the Mercury Switch Out Program's website for proper techniques to clean up the spill.

#### *4.8.3 Disposal*

Once the container has been filled, use the pre-paid waybill provided by the Mercury Switch Out Program to ship the switches back to the mercury management facility for safe disposal.

### **4.9 Lead**

#### *4.9.1 Collection*

Most lead in ELVs comes from wheel weights and battery cable ends. These items must be removed from vehicles prior to crushing and stored in separate, covered strong containers. Lead can be recycled into other usable items (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008).

*4.9.2 Stockpiling*

Store lead wheel weights and battery cable ends in separate, covered strong metal or wooden containers.

*4.9.3 Disposal*

Lead can be recycled into other usable items. The ELV operator will have to contact a metals recycler and make arrangements for them to accept the recovered lead.

#### 4.10 Summary

The following table summarizes information presented in Sections 4.1 to 4.9 of this manual.

**Table 2: Summary of Hazardous Materials Management Procedures for ELVs**

Type of Material	Collection	Stockpile	Disposal	Comments
Battery	Disconnect terminals and remove from automobile.	Store in leak-proof container. Stack no more than 2 layers.	Recycling in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables.
Refrigerants	To be removed by a certified technician using a mobile refrigerant removal unit.	Store in approved storage containers for refrigerants.	Recycling in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables.
Gasoline or Diesel	Suction system specifically designed for removal of gasoline; Suction system specifically designed for removal of diesel.	Store in approved storage container, outside or in a well ventilated area.	Reuse “good” fuel in operable vehicles. Dispose of stale fuel to a facility in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Engine Oil Transmission Oil Power Steering Oil Differential Oil	Use hand pump or drain from vehicle components.	Store mixed together in steel drums or plastic containers.	Recycling in southern Canada or for use in a certified waste oil furnace.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Brake Fluid	Use dedicated hand pump to remove from vehicle.	Store separately in steel drum or plastic container.	Disposal in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Antifreeze	Use dedicated hand pump to remove from vehicle.	Store separately in steel drum or plastic container.	Reuse “good” antifreeze in operational vehicles. Dispose of waste antifreeze to a facility in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Windshield Washer Fluid	Use dedicated hand pump to remove from vehicle.	Store separately in steel drum or plastic container.	Reuse “good” washer fluid in operational vehicles. Dispose of waste washer fluid to a facility in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Mercury Switches	Use small flathead screwdrivers and wire cutters to remove assemblies from vehicles. Remove metal mercury pellet from assembly.	Store in designated mercury switch collection container provided by the Mercury Switch Out Program.	Use waybill provided by the Mercury Switch Out Program to ship to mercury management facility.	Must be labelled, packaged and manifested as hazardous wastes.
Lead Wheel Weights	Remove battery cable ends and wheel weights from vehicles.	Store in separate covered, strong metal or wooden containers.	Recycling in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables.

## **5 APPLIANCES**

Appliances contain hazardous materials that must be removed prior to stockpiling and crushing at a solid waste site. As removal and disposal techniques of refrigerants and mercury switches from appliances is similar to those used for ELVs, it may be beneficial to have these items removed from appliances during the processing of ELVs. This is especially true if a certified refrigerant removal technician must be brought into the community to remove the refrigerants from ELVs. The following sections describe the various types of hazardous materials, where to find them and how to remove them from appliances.

### **5.1 Refrigerants**

#### *5.1.1 Collection*

Refrigerants are found in refrigerators, freezers, window air conditioners and dehumidifiers. Refrigerants must be removed in a similar manner to the process described for ELVs. Removal of refrigerants must be performed only by a certified technician. Technicians must use an approved portable refrigerant recovery unit and follow approved procedures for removal of refrigerants from appliances. Venting of refrigerant into the atmosphere is unacceptable (Environment Canada, 2010).

Appliance dismantlers should also be aware that oil found in the appliance compressors may be contaminated with refrigerants. A certified refrigerant removal technician should be able to safely remove and dispose of refrigerants in the oil and the contaminated compressor oil (Environment Canada, 2010).

#### *5.1.2 Stockpiling*

Recovered refrigerant must be stored in an approved storage container for the transport of refrigerant materials. Different refrigerants should not be mixed and refrigerant containers that held one type of refrigerant should not be used to hold another type (Environment Canada, 2010). The refrigerant recovery technician must be knowledgeable of which containers are approved for the collection and transport of recovered refrigerant. Technicians must also keep a record of what type and how much refrigerant was removed. Storage containers must be labelled appropriately for transport.

#### *5.1.3 Disposal*

Waste refrigerant from appliances can be disposed of through the Refrigerant Management Canada™ program on a fee basis. This program was set up to safely collect and destroy refrigerant compounds without releasing them into the atmosphere. For more information on the program or for contact information on coordinating disposal of waste refrigerants please contact an RMC Collection Service Provider. Contact information for providers can be found on the Refrigerant Management Canada™ website: <http://www.refrigerantmanagement.ca/index.php>.

## 5.2 Mercury Switches

### 5.2.1 Collection

Mercury switches may be found in a variety of appliances, generally those that have automatic shut-off features and/or convenience lighting. These appliances may include freezers, washing machines, gas ranges, gas hot water heaters, gas furnaces, sump pumps, etc. However, these mercury switches do not look the same as those found in vehicles and therefore caution must be taken when identifying and retrieving switches from appliances. The Vermont Department of Environmental Conservation in conjunction with the Vermont Mercury Education & Reduction Campaign and Chittenden Solid Waste District have developed a manual titled *Household Appliance Mercury Switch Removal Manual*. A copy of this manual has been included as an appendix to this guideline or alternatively can be found on the following website: <http://www.mercvt.org/PDF/appman.pdf>.



**Figure 17: Assorted Mercury Freezer Switches for Disposal**

*(Source: Vermont Department of Environmental Conservation, Vermont Mercury Education & Reduction Campaign, Chittenden Solid Waste District, 2002)*



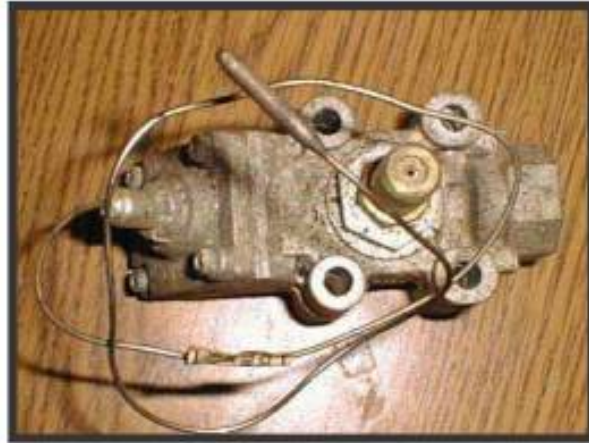
**Figure 18: Chest Freezer Light with an Inline Mercury Switch (Glass Ampule)**

*(Source: Vermont Department of Environmental Conservation et al., 2002)*



**Figure 19: Washing Machine Mercury Switch**

*(Source: Vermont Department of Environmental Conservation et al., 2002)*



**Figure 20: Gas Safety Valve Control, Gas Safety Valve Capillary Tube and Safety Valve Sensor Bulb from Gas Range**

*(Source: Vermont Department of Environmental Conservation et al., 2002)*



**Figure 21: Sump Pump Float Containing Mercury**

*(Source: Vermont Department of Environmental Conservation et al., 2002)*

### 5.2.2 Stockpiling

Once mercury containing units have been removed, they should be stored in a heavy plastic container with a proper fitting lid. Containers must be in good condition and must not leak. It is advisable not to use an aluminum or tin container as mercury may react with these metals and may leak through the container. Container contents must be marked on the outside of the container and containers must be stored in a dry location where they will not be disturbed (California Environmental Protection Agency, 2005).

### 5.2.3 Disposal

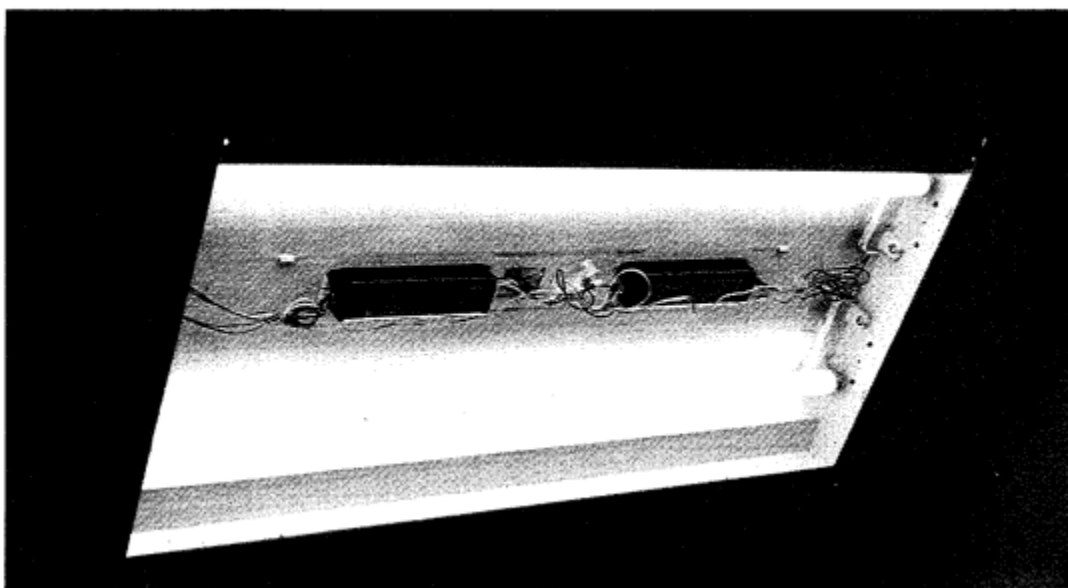
Summerhill, the company which operates the Mercury Switch-Out Program for ELVs, in conjunction with the Canadian Appliance Manufacturers Association, is currently working on developing a similar program for the collection of mercury switches from appliances. Information regarding this program can be found by contacting the Summerhill Impact group or on the following website:

<http://www.summerhillgroup.ca/eng/impact/programs/appliance-switches.php>.

## 5.3 Ballasts

### 5.3.1 Collection

Ballasts are components generally found in fluorescent lighting fixtures and high intensity discharge (HID) lamps. In fluorescent lighting fixtures, the ballasts are usually found between two fluorescent tubes and protected by a heat shield. HID ballasts are generally found encased within a box attached to the outside of the light fixture or located within the light housing. Examples of HID lamps include streetlights and parking garage lights (Environment Canada, 1991).



**Figure 22: Fluorescent Lamp Unit with Exposed Lamp Ballasts**

*(Source: Environment Canada, 1991)*

It should be noted that fluorescent lights found in appliances such as stoves may contain ballasts that may have PCB material within them. Unless ballasts are identified as “PCB free”, these items should be removed and properly disposed of as hazardous waste.

Fluorescent ballasts contain a core/coil unit, a thermal protector and a capacitor. The capacitor may contain PCBs. It is the PCBs that are of concern as they may pose a risk to human and environmental health. These ballasts may also be filled with an asphalt/silica type compound. If the ballast contains this compound, the capacitor within the ballast will not be readily accessible. Therefore, it is important that the entire ballast unit is removed and disposed of through a proper hazardous waste disposal company. HID ballasts usually require higher levels of capacitance than fluorescent ballasts. Therefore, they often contain more capacitors and hence may contain more PCBs than fluorescent light ballasts (Environment Canada, 1991).

In the late 1970's to early 1980's, many companies began phasing out the use of PCBs in capacitors. However, there are still ballasts with capacitors in use today that may contain PCBs and therefore caution must be taken when removing and disposing of ballasts. In order to determine if a ballast contains PCBs, the manufacturer of the ballast should be contacted. The manufacturer should be able to determine whether the ballast contains PCBs based on the date codes and/or catalogue codes on the ballast casing (Environment Canada, 1991). Many manufacturers also began labelling non-PCB containing electrical equipment to aid in proper handling. Equipment labelled as "PCB-free" or "Non PCB" does not require removal. The recycler should mark each appliance as inspected and cleared as appropriate.

Caution must be taken when removing ballasts. The fixture must be de-energized prior to removal of the ballast and must not be re-energized during the removal. Capacitors may also hold a charge for several days after their last use and therefore there is a risk of electric shock to persons removing capacitors. As there is a possibility of PCBs leaking from the ballast, goggles and acid resistant gloves must be worn when removing and handling the ballast (Connecticut Department of Environmental Protection, 2005).

It should be noted that fluorescent lamp tubes contain mercury phosphor powder, lead and cadmium and must not be disposed of in the general waste stream. They must be disposed of through an approved hazardous waste recycler and/or disposal company. If the tubes are not broken, they may be packaged in their original packaging and sent to an approved facility with no further special transportation requirements. However, if the tubes are broken, special safety, handling, packaging and transportation requirements must be met. Safety procedures are of utmost importance to prevent worker exposure to mercury. In the case of disposing of a broken fluorescent tube, contact a Safety Officer at the Prevention Services Division, Workers Compensation Board in Iqaluit at (867) 979-8500 or 1-877-404-4407 (Environmental Protection Service, 2003).

### 5.3.2 Stockpiling

The PCB Regulations (published in the Canada Gazette, 2008) under the Canadian Environmental Protection Act, 1999 states in paragraph 24:

“PCBs or products containing PCBs shall be stored at a site that is

- (a) a building, room, shipping container or other enclosed structure; or
- (b) an area that is enclosed by a woven mesh wire fence or any other fence or wall with similar security characteristics, and the fence or wall shall be at least 1.83 m high.”

The PCB Regulations go on to state in paragraph 25:

“The owner or operator of a PCB storage site shall

- (a) store all PCBs or products containing PCBs that are in liquid form in
  - (i) sealed containers, other than drums, that are made of steel or other metals that provide sufficient durability and strength to prevent those PCBs or products from being affected by the weather or released, or
  - (ii) drums that are
    - (A) of a capacity not greater than 205 L,
    - (B) a closed-head double-bung drum made of steel having a gauge of 16 or heavier, and
    - (C) painted or treated to prevent rusting;
- (b) store all PCBs or products containing PCBs that are in solid form in
  - (i) containers, other than drums, that are made of steel or other materials that provide sufficient durability and strength to prevent those PCBs or products from being affected by the weather or released, or
  - (ii) drums that are
    - (A) of a capacity not greater than 205 L,
    - (B) made of steel having a gauge of 18 or heavier,
    - (C) equipped with a securely attached, removable steel lid and a gasket made of material that is resistant to the PCBs or the products containing PCBs that are stored in the drums, and
    - (D) painted or treated to prevent rusting;

- (c) store equipment containing PCB liquids in
  - (ii) containers, other than drums, that are made of steel or other materials that provide sufficient durability and strength to prevent the equipment from being affected by the weather and to prevent any PCB liquid that leaks from the equipment from being released, or
  - (iii) drums described in subparagraph (b)(ii);”

Paragraph 25 goes on to list the storage space requirements for the above described containers. A copy of the PCB Regulations has been included as an appendix to this manual. Please refer to this document for further proper storage, handling and documentation information and requirements.

### *5.3.3 Disposal*

As previously stated, ballasts containing hazardous materials must be sent to an approved hazardous waste disposal facility. PCB Disposal (a division of Sanexen Environmental Services Inc.) is a company located in Ontario that will accept and dispose of PCB containing ballasts. They have also published a document to help identify ballasts that may contain PCBs. Further information regarding this company can be found on the website at: <http://www.pcbdisposalinc.com/>.

## **5.4 Capacitors**

### *5.4.1 Collection*

Capacitors found in household appliances are predominantly labelled as either ‘oil-filled’ or ‘dry’. Oil-filled capacitors are often referred to as running capacitors. Running capacitors are generally used in applications where they are required to be in use during the entire operating time. As they are constantly in use, heat builds up within the capacitor. The oil contained within the capacitor helps to dissipate this heat. Oil-filled capacitors manufactured prior to the late 1970’s and early 1980’s may contain PCB compounds within the oil. In order to determine if the capacitor contains PCB material, contact the manufacturer and provide the date and/or catalogue code located on the capacitor casing. Some capacitors may be stamped with “NO PCBs” on the casing. In this case, the capacitor does not contain PCBs. Appliances that most likely contain oil-filled capacitors include air conditioners, copy machines, microwave ovens, mercury vapour lamps, dehumidifiers and submersible well pumps. Capacitors in microwaves can be found behind the front control panel and wired to the transformer (Connecticut Department of Environmental Protection, 2005).

Be aware that oil-filled space or portable heaters may not contain a PCB capacitor, however, PCBs may be found within the actual oil. Although most oil-filled space heaters do not contain PCBs, those that do may have very high concentrations of PCBs. It is recommended that any of these types of heaters be tested for the presence of PCBs prior to crushing or disposal (Connecticut Department of Environmental Protection, 2005).

Dry capacitors are generally known as starting capacitors as they are used to start a motor during the initial start up. Once the motor is running, they are no longer needed and so are not used during the entire motor operation. Because these capacitors are only used for short periods of time, they do not produce much heat and therefore do not require oil for heat dissipation. Starting capacitors are usually identified by a non-sealed black casing or outer shell. Starting capacitors are generally found in clothes dryers, fans, refrigerators, stoves, televisions, washing machines and various electronic equipment. These capacitors are not known to contain PCB materials and so are not required to be handled as hazardous waste material.

#### *5.4.2 Stockpiling*

Capacitors containing PCBs should be stockpiled as outlined in Section 5.3.2 of this manual.

It is important to keep ballasts and capacitors containing PCBs away from fire hazards. Fire may cause these items to explode and release PCBs into the environment.

#### *5.4.3 Disposal*

Capacitors containing PCBs should be disposed of as outlined in Section 5.3.3 of this manual.

## **6 HEALTH AND SAFETY**

### **6.1 Worker and Public Safety**

As ELV dismantling operations deal with a number of hazardous substances, employee and public safety are very important. Employers must ensure that their employees are trained in safe work practices for the facility. This may include but not be limited to special handling and storage requirements of hazardous materials, WHMIS, first aid, emergency procedures, etc. Employers must also provide employees with the necessary personal protective equipment (PPE) to complete their jobs in a safe manner. PPE and safety items that should be maintained on-site include:

- Approved safety boots (steel toe)
- Eye goggles
- Gloves
- Eye wash station
- First aid kit
- Fire extinguisher as approved by the Fire Marshall
- Work coveralls.

Workers should also remove items from vehicles in the following order to prevent injury and environmental damage:

- Remove the battery first to de-energize the vehicle.
- Remove refrigerants to prevent accidental release into the environment.
- Remove gasoline in a well ventilated area to prevent the build up of fumes and decrease the risk of fire or explosion.
- Remove other hazardous materials.

Public safety must also be taken into consideration when operating an ELV dismantling facility. All hazardous items must be kept in a secure location and away from public access. At the completion of each day, the site should be secured to prevent access.

## **6.2 Environmental Health and Safety**

With the collection and storage of hazardous materials on-site, there is the potential for environmental contamination to occur. The following best practices should be used in order to mitigate potential spills and contamination (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008):

- Store all hazardous materials in approved containers with securely fitting lids.
- All containers holding hazardous materials should be placed within a secondary containment area.
- Remove gasoline outside of the dismantling area in a well ventilated area.
- Remove refrigerants after the battery has been removed, but before removal of any other fluids or parts to prevent accidental discharge into the environment.
- Drip pans must be used at all times to catch fluids dripping from vehicles and to prevent spills.
- The dismantling area should have an adequate roof and concrete floor pad for easy clean up of spills and to prevent soil contamination. An alternate for smaller/temporary locations is to undertake work outdoors in dry warm weather only upon an impermeable working surface. The constructed temporary vehicle fluid recovery area should consist of, for example, a protective sand layer/poly liner/sand layer covered with a plywood working surface.
- Ensure water runoff does not flow through areas containing hazardous wastes.
- Spill kits should be available on-site.
- Ensure there is lime or bicarbonate of soda on hand to neutralize spilled battery acid.
- Dispose of all used spill cleanup material as hazardous wastes.

In order to follow the above best practices, the following equipment should be kept on hand (Minnesota Pollution Control Agency, 2002):

- Fire extinguishers should be available in all facility buildings. Please contact the Fire Marshal for specific type of fire extinguisher and code requirements.
- Safety equipment such as rubber or latex gloves and safety goggles.
- Absorbent materials such as rags, towels, sawdust, etc.
- Containers to hold spilled waste and used absorbent materials.
- Shovels and/or scoops.
- Industrial spill clean-up products tailored for the clean up of oils and solvents may want to be used. This will be dependent on the operation of the facility and will have to be determined whether purchase of these items is warranted.

## **7 COST RECOVERY**

Due to the location of many communities in Nunavut, transportation of vehicle hulks and associated hazardous materials to proper recycling and disposal facilities can be quite expensive. However, there are a few items that can be salvaged from ELVs, in advance of crushing, that may be sold to recyclers to help cover some of the related disposal costs. Recovery costs of these items will be dependent on the market value of the materials at the time of sale. These items may include:

- Catalytic converters (contains several precious metals)
- Aluminum wheels
- Fuel
- Windshield washer fluid
- Antifreeze
- Waste oil

Unfortunately, sales of these items will likely not cover the entire cost of the program. Funding will have to be supplemented to complete the entire cycle of dismantling and disposal.

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## **APPENDIX A**

Household Appliance Mercury Switch Removal Manual

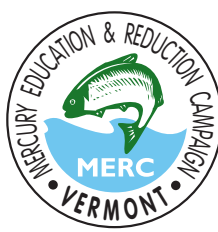
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# HOUSEHOLD APPLIANCE MERCURY SWITCH REMOVAL MANUAL

SPRING 2002



PRODUCED BY:



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## REFERENCES



## 1.0 INTRODUCTION

Mercury (Hg) is one of the most widespread, persistent and toxic contaminants in our environment. Its incorporation into many products and its emission from combustion processes has resulted in well documented instances of population poisonings, high level occupational exposures, and worldwide, chronic, low-level environmental exposures. About two-thirds of the mercury in the atmosphere comes from human sources such as coal burning power plants and incinerators, and one-third from natural sources such as volcanoes and forest fires. The amount of mercury flowing into our lakes is between two and four times what flowed into them 100 years ago<sup>8</sup>.

In the environment, mercury is found in various forms and complexes. Atmospheric mercury mixes with rain and snow and falls into lakes, rivers and watersheds. Once mercury enters a waterway, natural processes convert a small proportion of it to methyl mercury. Methyl mercury, one organic form of mercury, can accumulate up the food chain in lakes, ponds and reservoirs which results in high concentrations in predatory fish.

When certain mercury-tainted fish are consumed by humans, the levels of mercury can impair development of the nervous system in the fetus and in young children, affecting sensory, motor and cognitive functions, and resulting in such problems as difficulty in learning to read and inability to concentrate. Vermont's relatively pristine waters have not been spared from this regional and global problem. In addition to fish consumption advisories that recommend limiting consumption of certain fish in certain bodies of water, recent studies have shown that 12 percent of Vermont's lakes have sufficient mercury in their food chains to put common loons at considerable risk of toxic effects.

In order to prevent the continued release and build-up of mercury (in all forms) in the environment, many states including Vermont are currently working towards eliminating major sources of mercury releases. The Governors of the New England States and the Premiers of the Eastern Canadian Provinces have endorsed a regional goal of "the virtual elimination of the discharge of mercury into the environment" from man-made sources. Vermont has addressed mercury elimination through its Mercury Education and Reduction Campaign (MERC), which has included thermometer exchanges, school clean-outs, retailer and contractor mailings, dairy manometer exchanges, pharmacy pledges and various other outreach efforts to remove mercury from the solid waste stream.

One of Vermont's other efforts is the removal of mercury from discarded household appliances or "white goods". Many of these white goods, which are currently being collected for their scrap metal value, contain mercury switches and thermocouples. Mercury was used in household appliances due to it being a highly reliable means for electrical switching in varied temperature and moisture conditions<sup>4</sup>.

When "white goods" are processed for scrap metal, mercury may be released to the environment. In fact, when white goods are processed (shredded) for scrap metal, there are three distinct by-products. These are classified into ferrous, non-ferrous metallic and nonmetallic components<sup>1</sup>. It is the "fluff" or non-metallic components that many of the hazardous constituents in household appliances adhere to, including mercury<sup>2</sup>. These hazardous components are then available to be released either through smokestack emissions at smelters, incinerators or through landfill leachate from intact products or ash from their incineration<sup>1</sup>. The diagram on the following page details how mercury cycles through the environment.

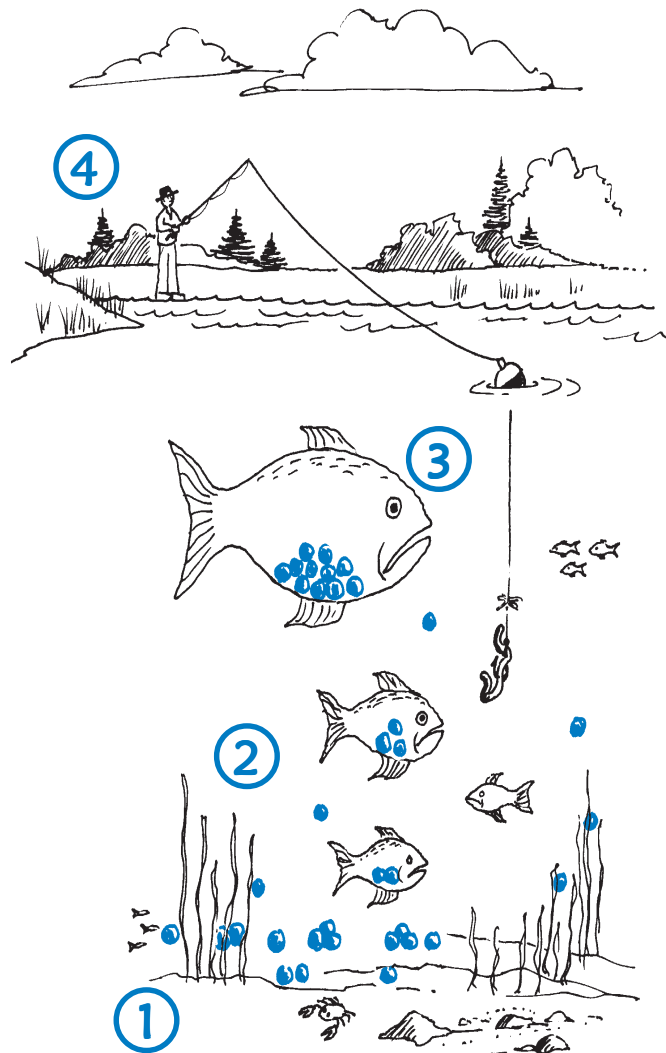
# How Does Mercury Get Into Fish?

Once in a lake or river, mercury is converted to methylmercury by bacteria and other processes. Fish absorb methylmercury from their food and from water as it passes over their gills. Mercury is tightly bound to proteins in all fish tissue, including muscle. **There is no method of cooking or cleaning fish that will reduce the amount of mercury in a meal.**

Methylmercury accumulates as you move up the food chain:

1. Methylmercury in the water and sediment is taken up by tiny animals and plants known as plankton.
2. Small fishes eat large quantities of plankton over time.
3. Large predatory fish consume many smaller fish, accumulating methylmercury in their tissues. The older and larger the fish, the greater the potential for high mercury levels in their bodies.
4. Fish are caught and eaten by humans and animals, causing methylmercury to accumulate in their tissues.

The State of Vermont Fish Contaminant Monitoring Program has been monitoring the levels of mercury in fish tissue since 1987. Measureable concentrations have been observed in 95% of the samples collected from lakes and rivers across the state. The highest amounts of mercury are generally found in older fish of species which consume other fishes. The species which contain the greatest amounts of mercury are walleye from Lake Champlain, smallmouth bass, and chain pickerel. The lowest mercury levels are found in pumpkinseed sunfish, brown bullhead, and brook trout from streams. The Vermont Department of Health has issued a fish consumption advisory which recommends that fewer meals be consumed of species with greater than average mercury levels. The advisory is also more protective of women of child-bearing age and children under age 7. For more information on consumption advisories call the Department of Health toll-free at 1-800-439-8550.



• = represents methylmercury

The purpose of this manual is to address the removal of mercury switches and thermocouples prior to appliances being processed for their scrap metal. By educating individuals on how to remove mercury prior to metal reclamation, we all can help manage mercury wastes properly and keep mercury out of the environment.

## 2.0 REGULATORY BACKGROUND

Mercury is an environmental concern because it is a heavy metal that can accumulate in living tissues and cause adverse health effects. When a mercury containing device is disposed of in a landfill or incinerator, the mercury in it can escape to contaminate air, soil, surface water and ground water. For a number of years, the Vermont Department of Health has issued health advisories warning people to limit consumption of freshwater fish caught in Vermont due to elevated levels of mercury in some fish species. When mercury is spilled in the home or workplace, the silvery liquid metal can evaporate and be breathed in by everyone in the building. Mercury affects the human brain, spinal cord, kidneys and liver. It affects the ability to feel, see, taste and move. Long term exposure can result in symptoms that get progressively worse and lead to personality changes, stupor and coma.

Mercury is intentionally added to many familiar products. Some of these include:

- fluorescent and high intensity discharge (HID) lights
- certain types of thermometers and thermostats
- heat sensors for gas pilot lights
- tilt switches in automobiles and appliances
- silent wall switches and electric relays
- vacuum gauges, barometers and manometers

For the last 20 years, mercury-containing waste from business, industry and institutions has been considered a hazardous waste because it often fails standard EPA toxicity test limits. More recently, a less restrictive waste handling option has been added to both state and federal hazardous waste regulations for certain mercury-containing wastes. These wastes are called “Universal Wastes” because they are equally likely to come from either regulated or unregulated sources. Only thermostats and hazardous waste (mercury-containing) lamps are currently listed as Universal Wastes. Wastes that are listed as “Universal Wastes” have reduced requirements for reporting, handling and storage (See Vermont Hazardous Waste Management Regulations, Subchapter 9, *Universal Waste Management Standards* for more information.). By having less restrictions on mercury-added product management, proper management can be easily facilitated.

The Vermont Agency of Natural resources is in the process of revising its “Universal Waste” rule to include all categories of mercury-added products. In the interim, to facilitate removal of as many of these products as possible from the solid waste stream and promote proper management of the collected mercury, these waste materials may be handled under existing provisions of the Vermont Hazardous Waste Management Regulations (See Subchapter 9, *Universal Waste Management Standards*) in the same manner as “Universal Waste Thermostats”.

In 1998, the Vermont legislature passed a bill to decrease the amount of mercury in the State’s solid waste. Under one provision of the bill, labeled mercury-added products are required to be separated

from the trash and are banned from landfill disposal. After March 1, 2000, all mercury-added products are required to be labeled under Vermont Law. Municipalities and Solid Waste Districts are required to provide collection programs for these materials. The Vermont law applies equally to households, farms, businesses and industries. The following mercury-added products are banned from landfill disposal and/or are required to be labeled in Vermont:

- thermostats or thermometers
- switches individually or part of other products
- medical or scientific instruments
- electric relays or other electric devices
- lamps
- batteries, other than button cells

## **HOW TO USE THIS MANUAL**

This manual covers:

- the purpose of mercury in particular appliances
- its location and use
- how to safely and properly remove it
- how to safely store mercury-added products
- the proper methods of disposal or recycling
- mercury spill clean-up
- lists of hazardous waste transporters, mercury recyclers and spill clean-up firms

Since we are constantly discovering additional products with mercury-added components, this manual remains a work in progress. Please let us know of any additional products that you feel should be added to this manual.

### 3.0 HOUSEHOLD APPLIANCE MERCURY REMOVAL

**Safety Note:** Proper personal protective equipment should be used at all times (i.e, safety glasses, gloves, tyvek suit and in the event of a spill a respirator and mercury cartridges). In addition, spill equipment and storage material should be on-hand prior to any mercury-added device removal.

All appliances should be unplugged from an electrical outlet prior to any mercury switch removal. Appliances that have had these devices removed should be disabled to prevent future use (i.e, cut the electrical cord, or disable the gas feed line). All appliances that have had their mercury switches removed should be handled as scrap metal for recycling (not to be reused as a home appliance). All other hazardous components must be properly removed and disposed of (including but not limited to chlorofluorocarbons (CFCs) and polychlorinated biphenyls (PCBs) prior to scrap metal recycling.

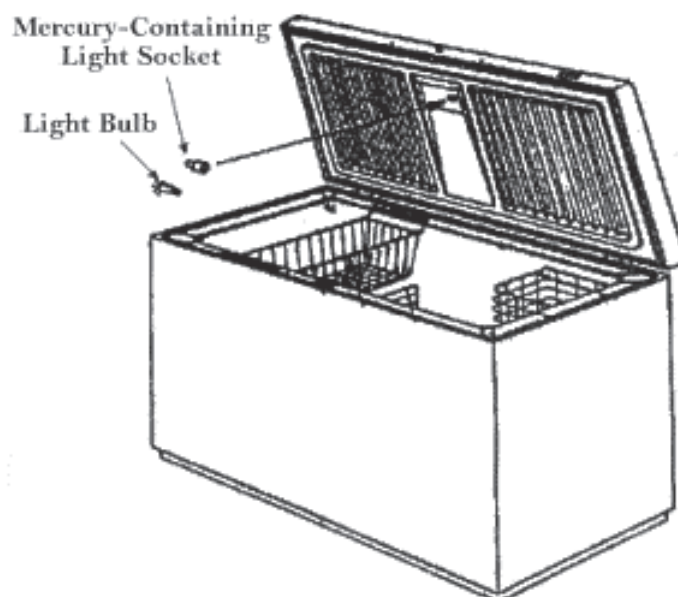
In case a switch breaks during the removal process, please follow the mercury spill clean-up instructions on page 20.

**Note:** Once these mercury-added products are removed, proper handling, storage and disposal are described on page 19 and in Appendix E.

### 3.1 Chest Freezers

Some chest freezers are made with a mercury switch inside the freezer cover light socket (see Figure below). The mercury engages two contact points when the lid is opened thus completing the electrical circuit and turning on the light. All freezer manufacturers have stopped using mercury as a switching mechanism and begun using a mechanical switch by January 1, 2000. If there is no visible push button switch mechanism, the freezer is likely to have a lid mercury tilt switch<sup>3</sup>.

Chest Freezer with Mercury-Containing Light Socket.



Reprinted with permission from the Association of Home Appliance Manufacturers, Appliance Recycling Information Center, Bulletin #8, Mercury in Home Appliances.

The following procedure should be used for removal of the mercury tilt switch.

## CHEST FREEZER MERCURY SWITCH REMOVAL

ESTIMATED REMOVAL  
TIME: 1-5 MINUTES



### STEP 1.

Open the freezer lid and look for a manual switch, similar to the one shown above. If it has a manual switch, the appliance can be handled as scrap metal (after removal of CFCs).



### STEP 2.

Locate the light socket on the underside of the lid (on some freezers you may have to remove a plastic light cover).



If there is no manual switch, proceed to **STEP 2.**

### STEP 3.

Remove the light bulb and properly discard.



### STEP 4.

Remove the plastic housing (either by unscrewing it or breaking it off).



### STEP 5.

Gently pull the light socket out of its mounting bracket (due to some lights having an in line mercury switch see Reference Photo 2 below).



### STEP 6.

Cut or remove the attached wires.



### STEP 7.

Remove and properly dispose of the entire light socket.



### REFERENCE PHOTO 1.

Assorted mercury freezer switches for disposal.



### REFERENCE PHOTO 2.

Chest freezer light with an inline mercury switch (glass ampule).



## 3.2 Washing Machines

Mercury switches were used in a small number of washing machines manufactured prior to 1972 because of their ability to reliably function in a high-moisture environment. Most washing machines with mercury switches will have passed through the recycling stream by 2010. Mercury switches were used for two different applications in washing machines, both of these uses were for consumer protection.

One application of the mercury switch was used to detect a lid opening and engage a brake to quickly stop the washer drum from moving. This feature is particularly important when the washer is in a spin cycle because it reduces the risk of a consumer being injured by reaching into a spinning basket. This switch is located between the washer tub and the cover for the tub area of the washer and is activated when the lid of the washer is lifted.

Another use for mercury switches in washing machines was in the dynamic stabilizing system to prevent a severe out-of-balance condition (only on certain models). This switch worked by breaking the circuit when the washing machine was severely out of balance. This switch is located on the back of certain washing machine models and is activated when the washing machine is severely out of balance.

These switches can be identified and removed using the following procedures.

### WASHING MACHINE MERCURY SWITCH REMOVAL

ESTIMATED REMOVAL  
TIME: 5-10 MINUTES



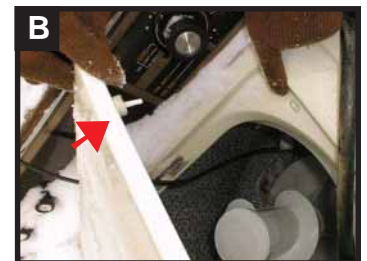
#### STEP 1.

Open the lid on the washer and look for a non-mercury mechanical switch. These switches come in various sizes, shapes and locations. You should also be able to hear an audible “click” when a mechanical switch engages and disengages (with the opening and closing of the lid). If there is no mechanical switch continue to STEP 2. Photos A and B are examples of non-mercury mechanical switches.

Non-mercury mechanical switch examples:



A) back tab switch



B) front tab switch.

Once you have determined that there is no mechanical switch, the following procedure can be used to remove the mercury switch.

#### STEP 2.

Pry off the top of the washing machine as shown in figure a. or remove any fasteners from the lid as shown in figure b.



**STEP 3.**

On the underside of the lid, attached to the lid mounting rod, is an encapsulated mercury switch.



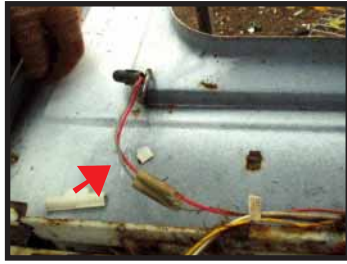
**STEP 4.**

Remove the switch from the bracket.



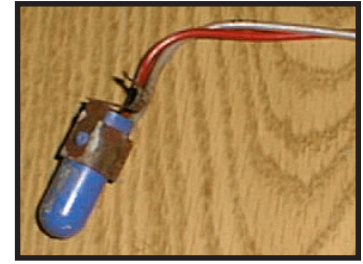
**STEP 5.**

Cut or remove any attached wires.



**STEP 6.**

Properly dispose of the entire washing machine mercury switch.



Another use for mercury switches in washing machines was in the dynamic stabilizing system to prevent a severe out-of-balance condition (only on certain models). Only through removal can you distinguish between a manual switch and a mercury switch. The mercury will be visible.

**SEVERE OUT-OF-BALANCE SWITCH REMOVAL**

**ESTIMATED REMOVAL TIME: 5-10 MINUTES**



**STEP 1.**

Locate the dynamic stabilizing switch on the back of the washing machine.



**STEP 2.**

Remove the fastening bolts.



**STEP 3.**

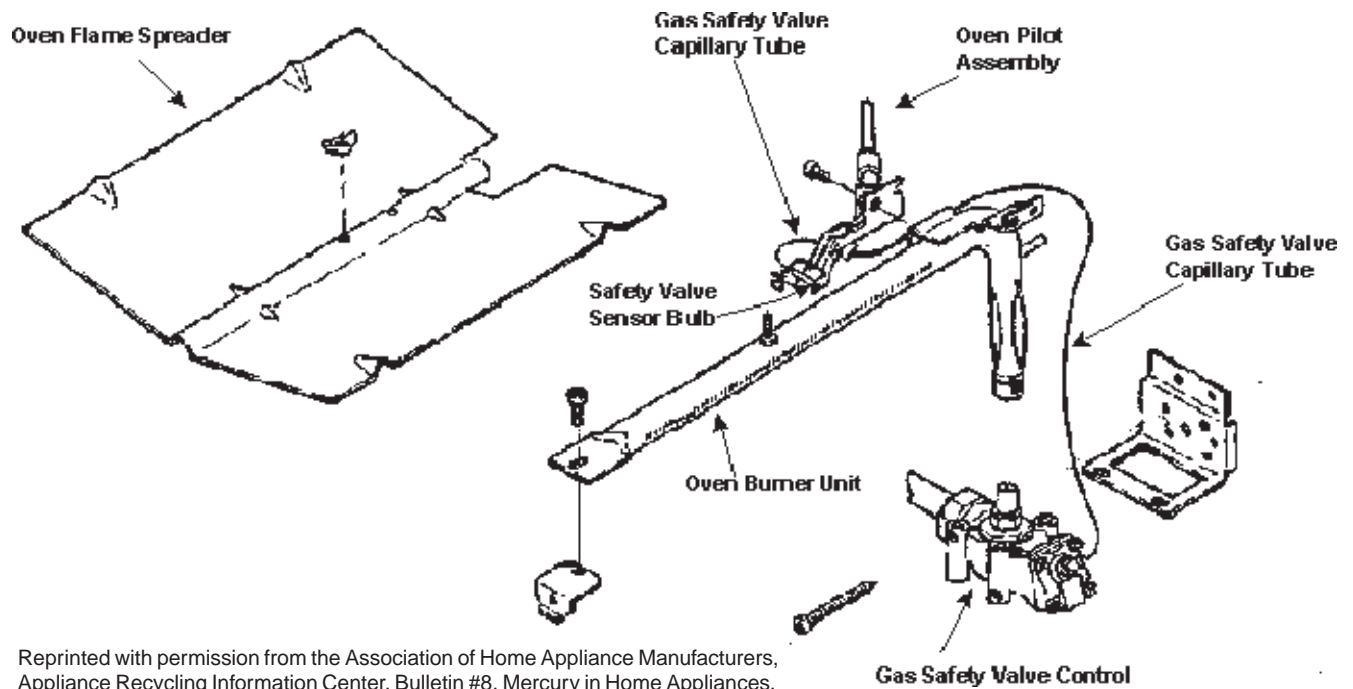
Disconnect the attached wires and properly dispose of the switch.



### 3.3 Gas Ranges

Gas ranges are ignited using either an electronic ignition system or a pilot-light. Pilot-light ranges require a mechanical safety device to detect whether the pilot-light is on and shut off the supply of gas to the burner when the pilot-light is not burning. Otherwise, the potential exists for a dangerous quantity of gas to build up in the oven. The diagram on the following page depicts the mercury containing control device on the gas burner assembly.

Gas safety valve (flame sensor) assembly.



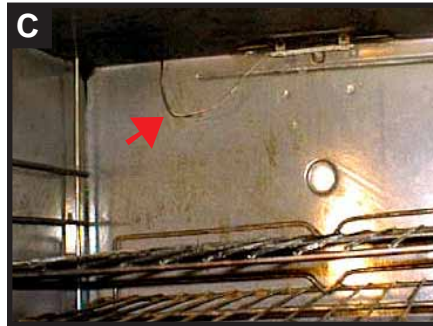
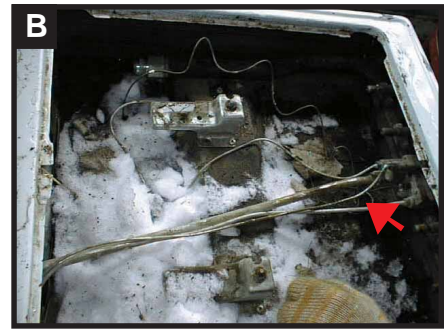
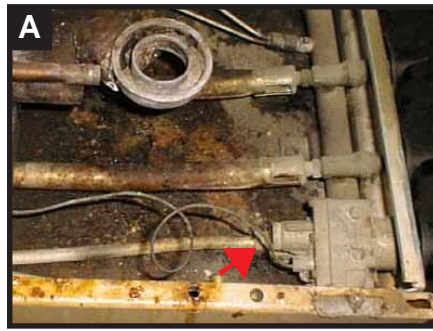
The gas burner is located beneath the oven cavity in the broiler pan. (*Note: All appliances manufactured after March 1, 2000 should be labeled if they incorporate a mercury-containing device.*) Gas ranges contain many temperature sensing probes and switches. The following procedure shows you how to distinguish the non-mercury probes and switches from the mercury switches (many times within the same appliance). Many of your stainless steel safety valve capillary tubes and sensor bulbs are mercury-containing devices while copper safety valve capillary tubes and sensor bulbs are non-mercury containing devices. **As a general rule, magnetic metals are mercury-containing probes while non-magnetic metals are non-mercury containing probes.** This may be difficult to distinguish with baked on food. What may appear copper maybe stainless steel coated with baked on food. Removal of any baked on food maybe necessary prior to determining metal type.

Temperature capillary tubes and bulbs found within ovens or below upper burners are usually copper probes. A copper probe is good indication of a non-mercury containing device. These capillary tubes and bulbs are instead filled with an oil or sodium-potassium mixture. Photos A thru D on the following page show some examples of non-mercury probes.

## NON-MERCURY TEMPERATURE PROBES

These photos are examples of non-mercury temperature probes in a gas range and oven. Photos A and B show the top view of a gas range after the burner surface has been removed. **Note that these capillary tubes and bulbs start at the temperature control knob.**

Photos C and D show the oven control temperature capillary tubes and bulbs (top of the oven cavity) which continue from the oven control knob into the oven cavity.



If you have determined that the gas oven capillary tubes and bulbs are mercury containing, the following procedure can be used to identify and remove the mercury gas safety valve control assembly.

## GAS RANGE MERCURY GAS SAFETY VALVE CONTROL ASSEMBLY REMOVAL PROCEDURE

ESTIMATED REMOVAL TIME: 15-20 MINUTES



### STEP 1.

Remove the broiler pan drawer.



### STEP 2.

Once the drawer is removed you can view the burner assembly inside.



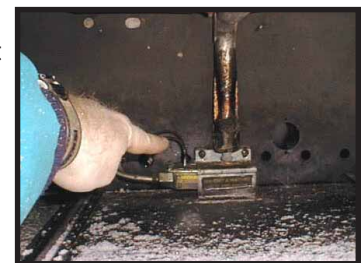
### STEP 3.

When viewing the burner assembly, the small capillary tube (pointed out) is indicative of a mercury sensor switch.



### STEP 3A.

Burner assemblies without a capillary tube but instead with an electronic pilot flame sensor (identifiable by the two wires) are **non-mercury**.



**STEP 3B.**

For gas ranges with a bracket covering the pilot, simply bend the bracket out of the way to view the wires indicating an electronic pilot sensor (non-mercury sensor).



Ranges without a capillary tube can be sent to scrap metal after making sure there is no fluorescent backlighting (see STEP 16) or PCBs.

For ranges with a capillary tube, **proceed to STEP 4.**

**STEP 4.**

If you have a capillary tube (like the one in the photo), you will now have to remove the burner assembly, valve and all attached gas fittings.



**STEP 5.**

Start by removing the key (sometimes a screw or a pressure fit) holding the burner assembly in.



**STEP 6.**

With the burner assembly loose, **proceed to STEP 7.**



**STEP 7.**

Disconnect the gas feed line by loosening the fitting or cutting the gas line.



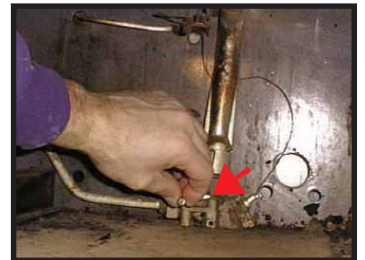
**STEP 8.**

Disconnect the pilot gas feed line by loosening or cutting (there may sometimes be two feed lines).



**STEP 9.**

Remove the two screws holding the gas safety valve control in place.



**STEP 10.**

The entire burner assembly and valve are now ready to be removed. Note there is no screw or pin holding the oven burner unit, this is an example of a pressure fitting oven burner unit.



**STEP 11.**

Gas range with the oven burner unit and gas safety valve control removed.



**STEP 12.**

The removed oven burner unit and gas safety valve control.



**STEP 13.**

Remove the screw holding the gas safety valve control and gas safety valve capillary tube and bulb to the oven pilot assembly.



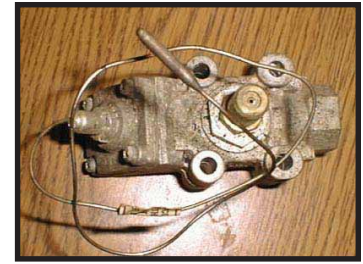
**STEP 14.**

Carefully pull the gas safety valve capillary tube and safety valve sensor bulb back through the bracket.



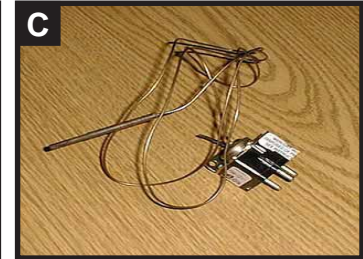
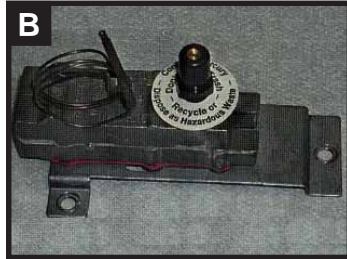
**STEP 15.**

The entire gas safety valve control, gas safety valve capillary tube and safety valve sensor bulb are now ready for proper disposal. **Proceed to STEP 16.**



**EXAMPLES OF SOME MERCURY GAS SAFETY VALVE CONTROLS, CAPILLARIES AND BULBS**

Photos A & B show complete mercury gas safety valve control, capillary and bulb. Photo C shows a gas auto pilot probe.



**GAS RANGE FLUORESCENT BACKLIGHTING REMOVAL**

**ESTIMATED REMOVAL TIME: 1-2 MINUTES**



**STEP 16.**

Prior to disposal, all stoves should be inspected to make sure that there is no fluorescent backlighting or PCBs. Some backlighting contains fluorescents and PCBs that come in various shapes and sizes (in addition to the one shown in the photos) and should be carefully removed and disposed of properly.



### 3.4 Gas Hot Water Heaters

Although all the current literature states that mercury was not used in residential hot-water heaters, the following procedure has been included to help prevent any mercury-added thermocouples from entering the waste stream and eventually the environment. Use the following procedure to properly identify and remove any mercury-containing thermocouples (usually commercial hot-water heaters of 100 gallons or more).

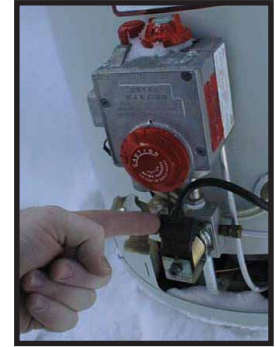
#### GAS HOT WATER HEATER MERCURY THERMOCOUPLE REMOVAL

ESTIMATED REMOVAL TIME: 5-10 MINUTES 

**STEP 1.**  
Locate the temperature control unit.



**STEP 2.**  
Determine if there is an electronic flame sensor (determined by the presence of wires) or if there is a mercury thermocouple.



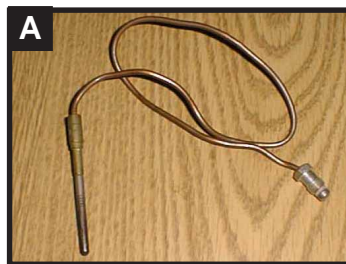
**STEP 3.**  
Use a magnet to determine if it is indeed a mercury probe (non-magnetic probes are non-mercury).



**STEP 4.**  
If the probe is mercury, simply remove the bottom of the heater and loosen the nut attaching the probe. Then properly dispose of the mercury thermocouple.

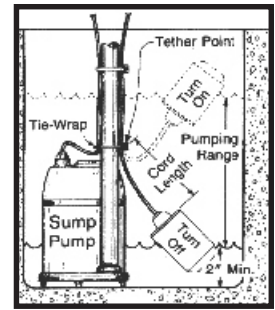


**PHOTO A.**  
A non-mercury temperature probe. Notice that this probe is copper, which is a good indication of a non-mercury containing device.



### 3.5 Sump and Bilge Pumps

Another use for mercury was as a switch in sump and bilge pumps. This switch, which functioned very reliably in the high moisture environment, turned on and off based on the corresponding water level (see sump pump diagram at right). As the water level rises, so does the float ball and wire (a wire attached to the float is a good indication of a mercury sump pump) which would then tilt the mercury switch, completing the electrical circuit that turns on the pump. As the water level receded the electrical circuit would then be broken and the pump would turn off.



Basic sump pump operation (mercury switch). Reprinted with permission from Purdue University.

#### SUMP PUMP MERCURY REMOVAL

ESTIMATED REMOVAL TIME: 1-2 MINUTES



A mercury-free sump pump. Notice the metal guide and no attached wires.

The sump pump on the left is an example of a mechanical sump pump. This pump works on the same principle that as the float ball rises up with the water it would turn on the pump (mechanical switch) and when the water recedes it would sink down with the water and shut the pump off. As can be seen in the photo on the left, a metal guide is used instead of a wire. This is a good indication of a non-mercury sump pump.



Sump pump float containing mercury.

Once you have determined whether or not it is a mercury sump pump, the wire attaching the float can simply be cut and the whole float properly disposed of (see photo at right).

#### BILGE PUMP MERCURY REMOVAL

ESTIMATED REMOVAL TIME: 1-2 MINUTES



Bilge pump containing mercury.

Bilge pumps work on the same principle as a sump pump. By rotating on a stationary point (see drawing on right) with the fluctuations in water level either up or down, the bilge pump would turn on or off. Several of the newer models use this method with a rolling steel ball instead of mercury to complete the electrical circuit. This can be determined by simply shaking the bilge pump. A steel ball bearing will be easily discerned from liquid mercury.



Automatic switch bilge pump.

Once you have determined it is a mercury bilge pump, you can simply remove the entire pump and properly dispose of.

## 4.0 MERCURY HANDLING, STORAGE AND DISPOSAL

Once mercury devices are removed, they should be properly handled, stored and disposed of. The handling, storage and disposal protocols covered below are a best management strategy for individuals or businesses (non-profit and for profit) that generate less than 11,000 pounds of universal waste at anytime (all universal wastes combined). Individuals or businesses who will be generating more than 11,000 pounds should refer to Subchapter 9, the Universal Waste Management Standards in the State of Vermont Hazardous Waste Management Regulations.

Included for your convenience are two fact sheets, **Appendix E - Waste Mercury Containing Switches and Devices** and **Appendix F - Fluorescent Lamps**, which summarize handling, storage and disposal requirements for these products.

### 4.1 Handling

A mercury-containing switch or product should always be handled in a way that will prevent breakage. Also when removing mercury or mercury-added components from a product do so only over or in a containment device that will collect and contain any mercury released in the event of a mercury-added product breaking. Be sure to keep spill clean-up kits (See Section 5, Mercury Spill Clean-up) and equipment readily available and always ensure that there is adequate ventilation. **Any spilled mercury or any contaminated clean-up materials must be handled as a hazardous waste. For large spill clean-ups (more than 1 or 2 tablespoons) a firm specializing in mercury clean-up should be acquired (see Appendix B).** Anyone handling mercury or mercury-added products should use proper personal protective equipment (latex gloves, tyvek suit, safety glasses and a respirator with mercury cartridges if cleaning up a mercury spill) and be thoroughly familiar with proper mercury handling and emergency procedures (See Appendix E - Waste Mercury Containing Switches and Devices Factsheet).

### 4.2 Storage

All mercury-containing switches or products must be stored in containers that will prevent any breakage or leakage. These containers must be closed, structurally sound and compatible with the mercury-added products being stored. All containers of mercury-added products must be properly labeled with one of the following; "Universal Waste- Mercury-added Product(s)", or "Waste Mercury-added product(s)" or "Used Mercury-added products" and stored for no more than one year.

### 4.3 Disposal

Properly contained and labeled mercury-added products can be disposed of in three possible disposal routes. These are:

- Disposal through a local Solid Waste District, Alliance or Municipality. This is usually done through Household Hazardous Waste Collection events or facilities (see Appendix A for a list of Solid Waste Districts, Alliances and Municipalities).
- Disposal through a hazardous waste transporter (see Appendix C).
- Disposal through a mercury recycler (see Appendix D).

## 5.0 MERCURY SPILL CLEAN-UP

### MERCURY SPILL KIT

At a minimum you should have the following supplies in the event of a mercury spill. Those removing and collecting mercury on a continued basis should consider adding a commercially available spill kit to these items.

- index cards
- respirator with mercury vapor cartridges
- sulfur powder
- flashlight
- rubber squeegee
- zinc or copper flakes
- tape
- Ziploc plastic bags
- paper towels
- plastic dust pan
- wide mouth plastic container with cover
- plastic trash bags
- latex gloves

**Note:** Most spill/safety equipment suppliers have complete spill kits for purchase. Contact the Agency of Natural Resources for purchasing information.

### EMERGENCY MERCURY SPILL CLEAN-UP PROCEDURE

***This clean-up procedure is only intended for small mercury spills.*** If the spill involves more than one or two tablespoons of free mercury or the material has splattered over a sizeable area, is in cracks and crevices or other difficult to clean places, or is on a non-disposable porous item such as wall to wall carpeting or upholstery, ***we recommend you retain an environmental firm with the equipment and expertise to perform the cleanup (see Appendix B) and call the Vermont Spills Hotline at 1-800-641-5005.***

- A) Wear latex gloves to prevent skin contact. Keep your hands away from your face-especially your eyes, nose and mouth. ***Before beginning any spill clean-up make sure that the area is adequately ventilated or you have a respirator with mercury vapor cartridges.***
- B) Carefully pick up any broken pieces of glass (***NEVER SWEEP OR VACUUM MERCURY***). Place them on a paper towel or tissue. Wrap or fold the paper towel, and place into a leak-tight plastic bag or sealable plastic container.
- C) Sprinkle sulfur powder on the spill area to control mercury vapors. Then, working from the outside of the spill area toward the center, push small mercury beads together with a card, stiff paper, or squeegee to form larger droplets. Put droplets into a leak-tight plastic bag or plastic container.

- D) Use the sticky side of a two-inch (or wider) duct or masking tape to pick up any remaining glass or mercury beads. Pay special attention to cracks and crevices. Place tape and debris in a leak-tight plastic bag or sealable plastic container.
- E) Use a flashlight to look all around the spill area. The light will reflect off the shiny mercury beads and make it easier to see them.
- F) Sprinkle sulfur powder on the spill area after cleaning up beads of mercury; a color change from yellow to brown indicates that mercury is still present and more cleanup is needed.
- G) Sprinkle zinc flakes or copper flakes (available at hardware stores) to amalgamate any small amounts of mercury which remain.
- H) When finished, carefully remove latex gloves and place them in a leak-tight plastic bag or sealable plastic container. Do not touch the glove fingertips or parts that may have come in contact with mercury. Place all the closed containers in a double plastic bag and tie the opening. Properly dispose through a hazardous waste transporter, mercury recycler (see Appendix C) or call your Solid Waste District, Alliance or Municipality (see Appendix A).
- I) Thoroughly clean your hands and body. ***Never wash contaminated clothing in a washing machine or remove contaminated clothing or apparel from a spill site. This will help prevent further site contamination.*** These should also be properly disposed of.



## APPENDIX A

### VERMONT SOLID WASTE DISTRICTS, ALLIANCES AND MUNICIPALITIES

#### **ADDISON COUNTY SOLID WASTE MANAGEMENT DISTRICT**

P.O. Box 573, Route 7 South  
Middlebury, VT 05753  
(802) 388-2333  
Fax: 388-0037  
email: [acswmd@acswmd.org](mailto:acswmd@acswmd.org)  
Website: [www.acswmd.org](http://www.acswmd.org)

#### Participating Towns:

Addison, Bridport, Cornwall, Ferrisburg, Goshen, Leicester, Lincoln, Middlebury, Monkton, New Haven, Orwell, Panton, Ripton, Shoreham, Starksboro, Vergennes, Waltham, Weybridge, Whiting

#### **BENNINGTON REGIONAL PLANNING COMMISSION**

Box 342  
Arlington, VT 05250  
(802) 375-9964  
Fax: 375-1561

#### Participating Towns:

Arlington\*, Dorset\*, Manchester\*, Pownal\*\*, Rupert, Sandgate\*, Shaftsbury\*\*, Stamford, Sunderland  
\* town works closely with BRPC  
\*\* send mailings directly to town contact

#### Town Contacts:

Pownal: Steffan Strohmaier, Pownal Town Office, P.O. Box 411, Pownal VT 05261 Tel# 823-7757.  
Shaftsbury: Dennis McCarthy, Asst. to Sel. Bd., P.O. Box 409, Shaftsbury VT 05262 Tel #442-4043.

#### **CENTRAL VERMONT SOLID WASTE MANAGEMENT DISTRICT**

137 Barre Street  
Montpelier, VT 05602  
(802) 229-9383 or 1-800-730-9475  
Fax: 229-1318  
email: [fieldprograms@cvswwmd.com](mailto:fieldprograms@cvswwmd.com)

#### Participating Towns:

Barre City, Barre Town, Berlin, Bradford, Cabot, Calais, Chelsea, East Montpelier, Hardwick, Marshfield, Middlesex, Montpelier, Northfield, Orange, Plainfield, Roxbury, Tunbridge, Walden, Washington, Williamstown, Woodbury

**CHITTENDEN SOLID WASTE DISTRICT**

1021 Redmond Road  
Williston, VT 05495  
(802) 872-8100  
Fax: 878-5787  
Recycling Hotline: 872-8111  
E-mail: info@cswd.net

Participating Towns:

Bolton, Burlington, Charlotte, Colchester, Essex, Essex Junction, Hinesburg, Huntington, Jericho, Milton, Richmond, St. George, Shelburne, South Burlington, Westford, Williston, Winooski

**GREATER UPPER VALLEY SOLID WASTE MANAGEMENT DISTRICT**

96 Mill St. P.O. Box 58  
North Hartland, VT 05052-0058  
(802) 296-3688  
Fax: 281-7088  
E-mail: guvswd@valley.net

Participating Towns:

Bridgewater, Hartland, Norwich, Pomfret, Sharon, Strafford, Thetford, Vershire, West Fairlee, Woodstock

**JOINT MUNICIPAL SURVEY COMMITTEE/SOLID WASTE ALTERNATIVE COMMITTEE**

87 Halls Pond Road  
Salem, NY 12865  
(518) 9702  
email: pam@starlitridge.com

Participating Towns:

Benson, Chittenden, Fair Haven, Middletown Springs, Pawlet, Rutland Town, Shrewsbury, Sudbury, Tinmouth, West Haven

**LAMOILLE REGIONAL SOLID WASTE MANAGEMENT DISTRICT**

29 Sunset Drive  
Morrisville VT 05661-9788  
(802) 888-7317  
Fax: 888-6507  
email: info@lrswmd.org

Participating Towns:

Belvidere, Cambridge, Craftsbury, Eden, Elmore, Hyde Park, Johnson, Morristown, Stowe, Waterville, Wolcott, Worcester

**LONDONDERRY GROUP**

Londonderry Recycling Coordinator  
P.O. Box 118  
South Londonderry, VT 05148  
(802) 824-6304

Participating Towns:

Langrove, Londonderry, Peru, Weston, Windham.

**MAD RIVER SOLID WASTE ALLIANCE**

P.O. Box 210  
Waterbury Center, VT 05677  
(802) 244-7373  
Fax: (802) 244-7570  
Email: malterport@aol.com

Participating Towns:

Duxbury, Fayston, Moretown, Waitsfield, Warren, Waterbury.

**NORTHEAST KINGDOM WASTE MANAGEMENT DISTRICT**

P.O. Box 1075  
Lyndonville, VT 05851  
(802) 626-3532 or 800-734-4602  
Fax: 626-3519  
email: progmgr@nekwmd.org

Participating Towns:

Averill, Averys Gore, Barnet, Bloomfield, Brighton, Brunswick, Concord, Danville, East Haven, Ferdinand, Granby, Groton, Guildhall, Holland, Lewis, Lunenburg, Lyndon, Maidstone, Morgan, Newark, Peacham, Ryegate, Sheffield, Stannard, Victory, Waterford, Warren Gore, Warners Grant, Westmore, Wheelock.

**NORTHWEST VERMONT SOLID WASTE MANAGEMENT DISTRICT**

10-12 Kingman Street  
P.O. Box 1547  
St. Albans, VT 05478  
(802) 524-5986  
Fax: 524-5987  
email: nswsdps@adelphia.net

Participating Towns:

Alburg, Bakersfield, Berkshire, Enosburg, Fairfield, Fletcher, Isle LaMotte, Montgomery, Richford, St. Albans City, Sheldon, South Hero.

## **RUTLAND COUNTY SOLID WASTE DISTRICT**

2 Green Hill Lane  
Rutland, VT 05701-5915  
(802) 775-7209  
Fax: 773-5796  
E-mail: rcswd@rcswd.com  
Recycling Hot Line: 773-4083

### Participating Towns:

Brandon, Castleton, Clarendon, Danby, Hubbardton, Ira, Mendon, Mt. Tabor, Pittsford, Poultney, Proctor, Rutland City, Sherburne, Wallingford, Wells, West Rutland.

## **SOUTHERN WINDSOR/WINDHAM COUNTY SOLID WASTE MANAGEMENT DISTRICT**

c/o NH/VT Solid Waste Project  
130 Pleasant Street suite #3  
Claremont, NH 03743  
(603) 543-1201  
Fax: (603) 542-5727

### Participating Towns:

Andover, Baltimore, Cavendish, Chester, Grafton, Ludlow, Plymouth, Reading, Rockingham, Springfield, Weathersfield, Westminster, West Windsor, Windsor.

## **WHITE RIVER ALLIANCE**

c/o Del Cloud  
Bethel Town Manager  
RR 1 Box 335  
Bethel, VT 05032  
(802) 234-9340  
Fax: (802) 234-6840

### Participating Towns:

Barnard, Bethel, Hancock, Pittsfield, Rochester, Royalton, Stockbridge.

## **WINDHAM SOLID WASTE MANAGEMENT DISTRICT**

327 Old Ferry Road  
Brattleboro, VT 05301  
(802) 257-0272  
Fax: 257-5122

### Participating Towns:

Brattleboro, Brookline, Dover, Dummerston, Guilford, Halifax, Jamaica, Marlboro, Newfane, Putney, Readsboro, Townshend, Vernon, Whitingham, Wilmington.

## **OTHER CONTACTS**

*Towns not listed in any of these Solid Waste Districts or Alliances should contact their town clerk, town offices or the Vermont Agency of Natural Resources for more information on proper disposal of Hazardous Waste.*

## APPENDIX B

### MERCURY CLEAN-UP PROFESSIONALS

The following is a partial list of companies that offer remediation (clean-ups/elimination, etc.) concerning air quality related situations. This list is not a recommendation or endorsement by the Vermont Agency of Natural Resources.

Key: L=liquid mercury  
M=microbial (mold, mildew, fungus, and/or bacterial)  
O=odors (post fire, etc.)  
C=chemical  
F=fuel

#### **Clean Harbors Env. Services, Inc.**

Offices also near Concord, NH and Boston, MA  
(1-800-OILTANK)  
32 Basik Road  
Glenmount, NY 12077  
(518) 434-0149  
Key- (M,O,L,C,F)

#### **Environmental Products & Service**

2 Flynn Avenue  
Burlington, VT 05401  
(802) 862-1212 or (1-800-THETANK)  
FAX-(802)860-7445  
(24 hr, 7/day/upc full cleanup response)  
Key- (L,C,F,M)

#### **Seacoast Ocean Services/SOS**

36 Custom House Wharf  
Portland, Maine 04101  
(800) 339-2111 or (207) 774-2111  
FAX (207) 774-7240  
Email: servoprovvt@aow.com  
Key- (M,O,L,C,F)

#### **Twin State Environmental Corp.**

34 Roosevelt Highway  
Colchester, VT 05446  
(802) 654-8663  
FAX (802) 654-8667  
Email: tsec@together.net  
Key- (L,C,F)



## **APPENDIX C**

### **HAZARDOUS WASTE TRANSPORTERS**

The following is a partial list of companies that offer hazardous waste transportation. This list is not a recommendation or endorsement by the Vermont Agency of Natural Resources.

#### **APTUS Inc.**

21750 Cedar Avenue  
P.O. Box 550  
Lakeville, MN 55044  
Contact: Bruce Burniece (612) 469-3475

#### **Clean Harbors Environmental Services**

35 Commerce Street #9  
Williston, VT 05495  
Contact: Cathy McNamara (802) 651-0558

#### **ENPRO Services Inc.**

12 Mulliken Way  
Newburyport, MA 01950  
Contact: Larry Bouchard (978) 465-1595

#### **Environmental Hazards Management Inc.**

P.O. Box 785  
Williston, VT 05495  
Contact: Ken Morton (802) 862-4537

#### **Environmental Products & Services of VT**

2 Flynn Avenue  
Burlington, VT 05401  
Contact: Donald Melander (802) 862-1212

#### **Heritage Environmental Services**

2 Avenue D  
Williston, VT 05495  
Contact: Kendra Demarest (802) 860-1200

#### **North Country Environmental Services**

11 Mill Street  
Barre, VT 05461  
Contact: David Barchard (802) 479-5299

#### **Safety Kleen Corp.**

221 Sutton Street  
North Andover, MA 01845  
Contact: Brenda Leonardo

**Total Waste Management**

142 River Road  
Newington, NH 03801  
Contact: Kevin Schmit (800) 345-4525

**Triumvirate Environmental Inc.**

P.O. Box 136  
Boston, MA 02143-0003  
Contact: Jeff Plotts (800) 966-9282

## APPENDIX D

### MERCURY RECYCLERS

The following is a partial list of mercury recyclers that accept all mercury-added products. This list is not a recommendation or endorsement by the Vermont Agency of Natural Resources.

**Adrow Chemical**

2 Lines Ave.  
Wanaque, NJ 07465  
Phone: (201) 839-2372  
Contact: Bill Delaney or Frank Bindhammer

**Bethlehem Apparatus**

890 Front St., P.O. Box Y  
Hellertown, PA 18055  
Phone: (610) 838-7034  
Contact: John Boyle

**Mercury Refining Co.**

1218 Central Avenue  
Albany, NY 12205  
Phone: (518) 459-0820  
Contact: Aaron Mars

**Advance Env. Recycling Corp.**

2591 Mitchell Ave.  
Allentown, PA 18103  
Phone: (800) 554-2372

**Environmental Enterprises, Inc.**

10163 Cincinnati-Dayton Rd.  
Cincinnati, OH 45241  
Phone: (800) 722-2818

**Mercury Waste Solutions, Inc.**

21211 Durand Avenue  
Union Grove, WI 53182  
Phone: (800) 741-3343  
Contact: Zach Unruh





# Environmental Fact Sheet

Vermont Department of  
Environmental Conservation  
103 South Main Street  
Waterbury, VT 05671

<http://www.anr.state.vt.us/dec/dec.htm>

VTDEC Publication #EA-1001

November, 2000

## Fluorescent Lamps: Handling and Disposal Guidelines

### Fluorescent and HID Lamps:

Fluorescent and HID lamps contain mercury, a highly toxic heavy metal. When lamps are broken or thrown in the trash, mercury is released to the environment. Even the small amount of mercury-laden phosphor powder contained in lamps can damage our lakes and streams and poison fish and wildlife. It is due to this toxicity of the mercury contained in lamps, that there are restrictions (limits) on their disposal.

In Vermont, the following types of lamps should not be placed in the trash:

#### Fluorescent Lamps

- full size fluorescents
- compact fluorescents

#### High Intensity Discharge (HID) Lamps

- mercury vapor lamps
- metal halide lamps
- sodium lamps



### Why Use Fluorescent and HID Lamps?

Using energy-efficient lighting makes good sense because:

- Fluorescent and HID lamps last longer
- Use less electricity than incandescent lamps and therefore:
  - Cost less to run
  - Result in less air pollution emitted from coal-burning power plants.

### Vermont Law Requires:

- Proper labeling of mercury-added products.
- Towns and Solid Waste Districts to implement a program to collect mercury-added consumer products and to inform the public about them.
- Proper disposal.

### General Recycling Guide for Fluorescent Lamps:

Here are a few precautions to take with Fluorescent and HID lamps after they have burned out:

- Do not break or crush lamps because mercury will be released.
- To avoid breaking the lamps, package them carefully when storing and transporting them. **DO NOT TAPE THEM TOGETHER!**
- Contact your local Town Manager or Solid Waste District (listed on the back of sheet) or the Agency of Natural Resources for information on the recycling program for Fluorescent and HID lamps in your area.
- If lamps are accidentally broken, follow the clean-up procedure below.

### Lamp Breakage Clean-up Procedure

- 1 Keep all people and pets away from breakage area so that mercury powder is not tracked into other areas.
- 2 Keep the area well ventilated.
- 3 Assemble the necessary supplies before cleaning up: Latex gloves, tweezers, tape, and a puncture resistant container.
- 4 Using the latex gloves, carefully pick up any broken glass and place in a puncture resistant container. Tweezers may be needed to safely pick up broken glass. Tape can also be used to pick up any remaining small pieces of glass and powder residue still located on the spill surface. **DO NOT VACUUM.**
- 5 After clean-up is complete, place the contaminated clean-up equipment along with any other material that came in contact with the mercury powder into the puncture resistant container or a sealable plastic bag.
- 6 Contact your local Town Manager, Solid Waste District or the Agency of Natural Resources for waste management options.

For additional information contact: Environmental Assistance Division tele: 802-241-3589 fax: 802-241-3273  
e-mail: [ead@dec.anr.state.vt.us](mailto:ead@dec.anr.state.vt.us)  
web site: <http://www.anr.state.vt.us/dec/ead/eadhome.htm>

# Fluorescent Lamp Management Q&A for Businesses & Municipalities

## Should I crush my lamps?

No, crushing mercury-containing lamps may pose health and environmental risks when mercury vapors are released. Lamps should be stored in ways that avoid breakage.

## How should I store mercury-containing lamps?

- ◊ Place used lamps in packaging functionally equivalent to that used to ship new lamps.
- ◊ Seal full packages with tape (**Do not tape lamps together**).
- ◊ Label packages with any one of the following phrases:
  - “Waste Mercury-Containing Lamp(s)”
  - “Used Mercury-Containing Lamp(s)”
  - “Universal Waste Mercury-Containing Lamp(s)”
- ◊ Store packages of lamps no more than five (5) feet high.
- ◊ Store packages for no more than one year.
- ◊ Store packages of waste mercury-containing lamps in a storage area identified by a sign that is clearly visible and has a label that includes the words: “Waste Mercury-Containing Lamps”.

## What if a mercury-containing lamp breaks?

Once a lamp is broken, it is considered a hazardous waste and should not be thrown in the trash. First allow the area to ventilate for 15 minutes. Then transfer any damaged or broken mercury-containing lamps and residue to a closed compatible container labeled “Hazardous Waste” (with a description of the contents). Once properly contained and labeled, the broken lamps and residue should be stored on an impervious surface within a structure that sheds rain and snow.

## How should we train workers who handle waste lamps?

All employees who handle or manage mercury-containing products shall be informed of proper handling and emergency procedures.

## Do I need any permits for transporting my own waste fluorescent and HID lamps?

No, only commercial haulers of waste lamps need to get a waste transporter’s permit or certification.

## What are the disposal options for mercury-containing lamps?

- ① Recycling through a Municipal or Solid Waste District Household Hazardous Waste collection program,
- ② Direct shipment to a lamp recycler or,
- ③ Shipment through a hazardous waste transporter.

## Where can I get additional information?

Additional information can be found by:

- ◊ Contacting your local Town Manager (if not in a Solid Waste District),
- ◊ Contacting your local Solid Waste District (*see the list at right*)
- ◊ Contacting the Agency of Natural Resources:
  - Waste Management Division (802) 241-3888
  - Environmental Assistance Division (802) 241-3589
- ◊ Accessing the following website <http://www.anr.state.vt.us/dec/waste.htm>
- ◊ Reviewing Subchapter 9 of the Vermont Hazardous Waste Regulations (*accessible through the above website*)

## Vermont Solid Waste Districts

ADDISON COUNTY  
SOLID WASTE DISTRICT  
(802) 388-2333

BENNINGTON REGIONAL  
PLANNING COMMISSION  
(802) 375-2576

CENTRAL VERMONT  
SOLID WASTE DISTRICT  
1-800-730-9475 OR (802) 229-9383

CHITTENDEN  
SOLID WASTE DISTRICT  
(802) 872-8111

GREATER UPPER VALLEY  
SOLID WASTE DISTRICT  
(802) 296-3688

LAMOILLE REGIONAL  
SOLID WASTE DISTRICT  
(802) 888-7317

MAD RIVER  
SOLID WASTE ALLIANCE  
(802) 244-7373

NORTHEAST KINGDOM  
WASTE MANAGEMENT DISTRICT  
1-800-734-4602 OR (802) 626-3532

NORTHWEST VERMONT  
SOLID WASTE DISTRICT  
(802) 524-5986

SOUTHERN WINDSOR/  
WINDHAM COUNTY  
SOLID WASTE MGMT DISTRICT  
(603) 543-1201 OR (802) 885-5827

RUTLAND COUNTY  
SOLID WASTE DISTRICT  
(802) 775-7209 OR 802-773-4083

RUTLAND NON-DISTRICT  
TOWNS JMSC/SWAC  
(802) 235-2710

WHITE RIVER  
ALLIANCE  
(802) 234-9340

WINDHAM SOLID  
WASTE DISTRICT  
(802) 257-0272



# Environmental Fact Sheet

Vermont Department of  
Environmental Conservation  
103 South Main Street  
Waterbury, VT 05671

<http://www.anr.state.vt.us/dec/dec.htm>

VTDEC Publication #EA-1002

July, 2001

## Waste Mercury-Added Devices: Handling and Disposal Guidelines

### Thermometers, Silent Switches and Temperature Probes

In addition to thermometers, mercury has been used for many years in electrical products. A moving drop of mercury is used to open or close electrical circuits in devices like thermostats, silent wall switches, sump pumps, and the tilt switches in automobiles, chest freezers, washing machines, and space heaters. Mercury is a naturally occurring heavy metal which at room temperature takes the form of a silvery liquid. When a mercury-containing device is broken or thrown in the trash, mercury is released to the environment. Even a small amount of mercury can damage our lakes and streams and poison fish and wildlife. It is because of mercury's toxicity that restrictions (limits) have been placed on how and where mercury-added products are disposed.



### Recognizing a Mercury-Added Device Is Not Always Easy

Although it is easy to see the silvery mercury in the bulb of a thermometer or the glass tilt switch of a home thermostat, most mercury containing devices enclose their mercury-added switches inside rubber, plastic or metal coverings. Also, not all electrical switches and temperature probes use mercury to function. Your Town Clerk, Town Manager, Solid Waste District (listed on the back of this sheet) and the Agency of Natural Resources has more information about which products have mercury in them and about the recycling programs for mercury-added devices in your area. (Also, see our Environmental Fact Sheet on Waste Mercury-Containing Lamps)

### Vermont Law Requires...

- ☞ Proper labeling of mercury-added products.
- ☞ Towns and Solid Waste Districts to offer programs to collect mercury-added consumer products and to inform the public about them.
- ☞ Proper disposal, **NOT IN THE TRASH!**

### General Recycling Guidelines

- ☞ Do not break, crush or take apart a mercury-added switch or device because mercury will be released.
- ☞ To avoid breaking the devices, package them carefully in individually sealed plastic bags placed inside larger sealable containers before storing or transporting them.
- ☞ Contact your Town Clerk, local Solid Waste District (listed on the back of this sheet) or the Agency of Natural Resources for information about recycling programs for mercury-added devices in your area.
- ☞ Contact local heating and air conditioning contractors or wholesalers about free thermostat take-back available through the Thermostat Recycling Corporation.
- ☞ If a mercury-added device is accidentally broken, use the following clean-up procedure.

### Mercury Spill Cleanup Procedure

#### **DO NOT SWEEP OR VACUUM MERCURY!**

- 1 Keep all people and pets away from the breakage area so that mercury is not tracked elsewhere.
- 2 Keep the area well ventilated by opening windows and shutting off the heat or air conditioning.
- 3 Collect the necessary supplies before cleaning up: latex gloves, stiff paper or cards, paper towels or tissues, wide masking or duct tape, a leak-tight plastic bag or sealable container, a small plastic scoop or eye dropper.
- 4 Wearing the gloves, carefully pick up any broken glass or pieces of the device. Place on a paper towel or tissue. Wrap or fold the paper towel and place it in a leak-tight plastic bag or sealable container.
- 5 Working from the edge of the spill towards the center, use a card or stiff paper to push small beads of mercury into larger droplets. Push the droplets into a plastic scoop or pick them up with an eye dropper. Place the mercury in a leak-tight plastic bag or sealable container.
- 6 Use the sticky side of masking or duct tape to pick up remaining bits of glass or mercury beads. Put the tape, debris, gloves and cleanup equipment in a leak-tight plastic bag or sealable container.
- 7 Contact your Town Clerk, Solid Waste District or the Agency of Natural Resources about how to dispose of mercury spill cleanup materials.

# Mercury-Added Device Management Q & A for Businesses and Municipalities

## How should I handle mercury-added devices?

Mercury-added switches and devices are often removable components found inside much larger appliances. Once the switch or component has been removed from the larger product, the component should not be disassembled further. If need be, it should be stored in an individually sealed plastic bag placed inside a larger sealable container to avoid breakage. Direct exposure to mercury metal may pose health and environmental risks when mercury vapors are released.

## Is every waste mercury-added product a hazardous waste?

When taken by itself, a mercury-added switch would exhibit the hazardous waste characteristic of toxicity for mercury. However, the hazardous waste regulations which apply to the proper handling and disposal of a mercury-added component do not automatically extend to the larger products containing them. For example, a mercury-added hood or trunk light switch does not turn the whole car into a hazardous waste.

## May waste mercury-added products or devices be handled as something other than a hazardous waste?

Yes. Both Vermont and federal hazardous waste regulations already contain provisions to simplify the handling and recycling of waste mercury-added thermostats and lamps. These are called "Universal Wastes". Under current Vermont Waste Management Division policy, the terms of these provisions have been extended to all fabricated mercury-added products, switches, and devices that are not presently listed as so-called "Universal Wastes".

## What if a mercury-added device breaks?

At a minimum, the device, the released mercury and cleanup debris should be sealed in a plastic bag and transferred to a closed compatible container labeled "Hazardous Waste" (with a description of the contents) and managed as a hazardous waste.

## What should we tell workers who handle waste mercury-added products?

All employees who handle or manage mercury-added products should be informed of the proper handling and emergency procedures for these products and for mercury.

## What are the disposal options for mercury-added devices?

- 1 Recycling through a Municipal or Solid Waste District's Household Hazardous Waste collection program.
- 2 Thermostats only Recycling by heating, ventilation and air conditioning wholesalers participating in the free thermostat take-back sponsored by the Thermostat Recycling Corporation.
- 3 Direct shipment as "Universal Waste" to a mercury recycling facility.
- 4 Shipment through a hazardous waste transporter to a proper destination facility.

## Where can I get additional information?

- ☞ Contact your Town Clerk or Town Manager (if not in a Solid Waste District)
- ☞ Contact your Solid Waste District (see list to the right or the Agency web site below)
- ☞ Contact the Vermont Agency of Natural Resources:

- Waste Management Division (802) 241-3888 (Hazardous/Universal Wastes)
- Environmental Assistance Division (802) 241-3589 (Mercury-Added Products) or, on the web at: [www.anr.state.vt.us/dec/waste.htm](http://www.anr.state.vt.us/dec/waste.htm) or [www.mercvt.org](http://www.mercvt.org)

- ☞ Also, see our "Waste Mercury Containing Lamps" and "Universal Waste" Fact Sheets
- ☞ Review the Vermont Hazardous Waste Management Regulations in Subchapter 9: Universal Waste Management Standards. (also available on the Agency of Natural Resources website above)

## Vermont Solid Waste Districts

ADDISON COUNTY  
SOLID WASTE DISTRICT  
(802) 388-2333

BENNINGTON REGIONAL  
PLANNING COMMISSION  
(802) 375-2576

CENTRAL VERMONT  
SOLID WASTE DISTRICT  
1-800-730-9475 OR (802) 229-9383

CHITTENDEN  
SOLID WASTE DISTRICT  
(802) 872-8111

GREATER UPPER VALLEY  
SOLID WASTE DISTRICT  
(802) 296-3688

LAMOILLE REGIONAL  
SOLID WASTE DISTRICT  
(802) 888-7317

MAD RIVER  
SOLID WASTE ALLIANCE  
(802) 244-7373

NORTHEAST KINGDOM  
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[www.anr.state.vt.us/dec/ead/eadhome.htm](http://www.anr.state.vt.us/dec/ead/eadhome.htm)

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## **APPENDIX B**

PCB Regulations

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# Canada Gazette



# Gazette du Canada

## Part II

## Partie II

OTTAWA, WEDNESDAY, SEPTEMBER 17, 2008

OTTAWA, LE MERCREDI 17 SEPTEMBRE 2008

Statutory Instruments 2008

Textes réglementaires 2008

SOR/2008-247 to 290 and SI/2008-93 to 107

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La Partie II de la *Gazette du Canada* est le recueil des « règlements » définis comme tels dans la loi précitée et de certaines autres catégories de textes réglementaires et de documents qu’il est prescrit d’y publier. Cependant, certains règlements et catégories de règlements sont soustraits à la publication par l’article 15 du *Règlement sur les textes réglementaires*, établi en vertu de l’article 20 de la *Loi sur les textes réglementaires*.

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Des exemplaires des textes réglementaires enregistrés par le greffier du Conseil privé sont à la disposition du public, dans les deux langues officielles, pour examen et vente à la Pièce 418, Édifice Blackburn, 85, rue Sparks, Ottawa, Canada.

Registration  
SOR/2008-273 September 5, 2008

CANADIAN ENVIRONMENTAL PROTECTION ACT, 1999

**PCB Regulations**

P.C. 2008-1659 September 5, 2008

Whereas, pursuant to subsection 332(1)<sup>a</sup> of the *Canadian Environmental Protection Act, 1999*<sup>b</sup>, the Minister of the Environment published in the *Canada Gazette*, Part I, November 4, 2006, a copy of the proposed *PCB Regulations*, substantially in the annexed form, and persons were given an opportunity to file comments with respect to the proposed Regulations or to file a notice of objection requesting that a board of review be established and stating the reasons for the objection;

Whereas, pursuant to subsection 93(3) of that Act, the National Advisory Committee has been given an opportunity to provide its advice under section 6<sup>c</sup> of that Act;

And whereas, in the opinion of the Governor in Council, pursuant to subsection 93(4) of that Act, the proposed Regulations do not regulate an aspect of a substance that is regulated by or under any other Act of Parliament in a manner that provides, in the opinion of the Governor in Council, sufficient protection to the environment and human health;

Therefore, Her Excellency the Governor General in Council, on the recommendation of the Minister of the Environment and the Minister of Health, pursuant to subsection 93(1) and section 97 of the *Canadian Environmental Protection Act, 1999*<sup>b</sup>, hereby makes the annexed *PCB Regulations*.

Enregistrement  
DORS/2008-273 Le 5 septembre 2008

LOI CANADIENNE SUR LA PROTECTION DE L'ENVIRONNEMENT (1999)

**Règlement sur les BPC**

C.P. 2008-1659 Le 5 septembre 2008

Attendu que, conformément au paragraphe 332(1)<sup>a</sup> de la *Loi canadienne sur la protection de l'environnement (1999)*<sup>b</sup>, le ministre de l'Environnement a fait publier dans la *Gazette du Canada* Partie I, le 4 novembre 2006, le projet de règlement intitulé *Règlement sur les BPC*, conforme en substance au texte ci-après, et que les intéressés ont ainsi eu la possibilité de présenter leurs observations à cet égard ou un avis d'opposition motivé demandant la constitution d'une commission de révision;

Attendu que, conformément au paragraphe 93(3) de cette loi, le comité consultatif national s'est vu accorder la possibilité de formuler ses conseils dans le cadre de l'article 6<sup>c</sup> de celle-ci;

Attendu que la gouverneure en conseil est d'avis que, aux termes du paragraphe 93(4) de cette loi, le projet de règlement ne vise pas un point déjà réglementé sous le régime d'une autre loi fédérale de manière à offrir une protection suffisante pour l'environnement et la santé humaine,

À ces causes, sur recommandation du ministre de l'Environnement et du ministre de la Santé et en vertu du paragraphe 93(1) et de l'article 97 de la *Loi canadienne sur la protection de l'environnement (1999)*<sup>b</sup>, Son Excellence la Gouverneure générale en conseil prend le *Règlement sur les BPC*, ci-après.

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PCB REGULATIONS

RÈGLEMENT SUR LES BPC

PART 1

PARTIE 1

GENERAL

GÉNÉRALITÉS

- Definitions **1.** (1) The following definitions apply in these Regulations.
- “Act” “Act” means the *Canadian Environmental Protection Act, 1999*.
- “authorized facility” “authorized facility” means a facility, including a transfer site, that is authorized by the authorities of the jurisdiction in which it is located to process PCBs or products containing PCBs or to conduct laboratory analysis or research with PCBs or products containing PCBs.
- “National Fire Code” “National Fire Code” means the National Fire Code of Canada 2005, NRCC No. 47667, issued by the Canadian Commission on Building and Fire Codes, National Research Council of Canada, as amended from time to time.

- 1. (1) Les définitions qui suivent s'appliquent au présent règlement.
- « BPC » Tout biphényle chloré visé à l'article 1 de la liste des substances toxiques de l'annexe 1 de la Loi.
- « Code national de prévention des incendies » Le « Code national de prévention des incendies » — *Canada 2005*, CNRC 47667F, avec ses modifications successives, publié par la Commission canadienne des codes du bâtiment et de prévention des incendies du Conseil national de recherches du Canada.
- « installation agréée » Installation — notamment un centre de transfert — qui est autorisée par les autorités du territoire où elle est située à transformer

- Définitions
- « BPC »
- « PCB »
- « Code national de prévention des incendies »
- « National Fire Code »
- « installation agréée »
- « authorized facility »

<p>“PCB” « BPC »</p>	<p>“PCB” means any chlorobiphenyl described in item 1 of the List of Toxic Substances in Schedule 1 to the Act.</p>	<p>des BPC ou des produits qui en contiennent, ou à les utiliser pour des analyses de laboratoire ou des recherches.</p>	
<p>“process” « transformer »</p>	<p>“process” includes to mix with a product.</p>	<p>« Loi » La <i>Loi canadienne sur la protection de l’environnement (1999)</i>.</p>	<p>« Loi » “Act”</p>
<p>“product” « produit »</p>	<p>“product” includes equipment.</p>	<p>« produit » S’entend notamment d’une pièce d’équipement.</p> <p>« transformer » S’entend notamment du fait de mélanger avec tout produit.</p>	<p>« produit » “product”</p> <p>« transformer » “process”</p>
<p>Concentration — several matrices</p>	<p>(2) For the purposes of these Regulations, if a solid or a liquid containing PCBs is composed of several matrices, the concentration of PCBs is based on the mass of the matrix in which the PCBs are located.</p>	<p>(2) Pour l’application du présent règlement, lorsqu’un solide ou un liquide qui contient des BPC est composé de plusieurs matrices, la concentration de BPC est basée sur la masse de la matrice dans laquelle les BPC se trouvent.</p>	<p>Concentration — plusieurs matrices</p>
<p>Concentration and quantity</p>	<p>(3) For the purposes of these Regulations, the concentration and quantity of PCBs shall be determined</p> <p>(a) by a laboratory</p> <p>(i) accredited by the Standards Council of Canada (SCC), the Canadian Association for Environmental Analytical Laboratories Inc. (CAEAL), or any other accreditation body that is a signatory to the <i>International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement</i>, and the laboratory shall be accredited in accordance with the International Organization for Standardization standard ISO/IEC 17025:2005 entitled <i>General Requirements for the Competence of Testing and Calibration Laboratories</i>, as amended from time to time, and</p> <p>(ii) for which the scope of accreditation shall include the analytical method used to determine the concentration of PCBs in the matrix in which the PCBs are located; or</p> <p>(b) by a laboratory</p> <p>(i) accredited in accordance with the <i>Environmental Quality Act</i>, R.S.Q., c. Q-2, as amended from time to time, and</p> <p>(ii) for which the scope of accreditation shall include the analytical method used to determine the concentration of PCBs in the matrix in which the PCBs are located.</p>	<p>(3) Pour l’application du présent règlement, la concentration et la quantité de BPC sont déterminées :</p> <p>a) soit par tout laboratoire :</p> <p>(i) qui est accrédité à la norme de l’Organisation internationale de normalisation intitulée <i>Exigences générales concernant la compétence des laboratoires d’étalonnages et d’essais (ISO/IEC 17025:2005)</i>, avec ses modifications successives, par le Conseil canadien des normes (CCN), l’Association canadienne des laboratoires d’analyse environnementale (ACLAE) ou tout autre organisme d’accréditation signataire de l’<i>International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement</i>,</p> <p>(ii) dont la portée d’accréditation couvre la méthode d’analyse utilisée pour déterminer la concentration des BPC dans la matrice dans laquelle les BPC se trouvent;</p> <p>b) soit par tout laboratoire :</p> <p>(i) qui est accrédité conformément à la <i>Loi sur la qualité de l’environnement</i>, L.R.Q., ch. Q-2, avec ses modifications successives,</p> <p>(ii) dont la portée d’accréditation couvre la méthode d’analyse utilisée pour déterminer la concentration des BPC dans la matrice dans laquelle se trouvent les BPC.</p>	<p>Concentration et quantité</p>
<p>Sampling method</p>	<p>(4) For the purposes of these Regulations, other than section 13, the concentration of PCBs in a matrix is determined using a provincially, nationally or internationally recognized sampling method for PCBs in the matrix in which the PCBs are located.</p>	<p>(4) Pour l’application du présent règlement, sauf l’article 13, la concentration de BPC se trouvant dans une matrice est déterminée au moyen de toute méthode d’échantillonnage pour les BPC dans cette matrice qui est reconnue à l’échelle provinciale, nationale ou internationale.</p>	<p>Méthode d’échantillonnage</p>
<p>Sampling method — bulk solid products</p>	<p>(5) For the purposes of section 13, the concentration of PCBs is determined using a sampling method for bulk solid products, which is set out in either federal or provincial legislation, as amended from time to time, or approved by the United States Environmental Protection Agency for compliance with the <i>Resource Conservation and Recovery Act</i> or with the regulations made under that Act, as amended from time to time.</p>	<p>(5) Pour l’application de l’article 13, la concentration de BPC est déterminée au moyen de toute méthode d’échantillonnage pour les produits solides en vrac qui est prévue par une loi ou un règlement fédéral ou provincial, avec ses modifications successives, ou qui est approuvée par la United States Environmental Protection Agency pour l’application de la loi des États-Unis intitulée <i>Resource Conservation and Recovery Act</i> ou de ses règlements avec leurs modifications successives.</p>	<p>Méthode d’échantillonnage — produits solides en vrac</p>

Application	<b>2.</b> (1) These Regulations apply to PCBs and to any products containing PCBs.	<b>2.</b> (1) Le présent règlement s'applique aux BPC et à tout produit qui en contient.	Application
Non-application	(2) These Regulations do not apply to the following: (a) the export and import of PCBs that are hazardous waste or hazardous recyclable material within the meaning of the <i>Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations</i> or the export of PCBs that are waste within the meaning of the <i>PCB Waste Export Regulations, 1996</i> ; (b) the sale, importation or advertising of liquids containing PCBs for use in microscopy, including immersion oils, but not including refractive index oils, which is prohibited under section 4 of the <i>Hazardous Products Act</i> ; and (c) the offer for sale, sale and use of land contaminated with PCBs or with products containing PCBs.	(2) Il ne s'applique toutefois pas aux activités suivantes : a) l'exportation et l'importation de BPC qui sont des déchets dangereux ou des matières recyclables dangereuses au sens du <i>Règlement sur l'exportation et l'importation de déchets dangereux et de matières recyclables dangereuses</i> et l'exportation de déchets contenant des BPC au sens du <i>Règlement sur l'exportation de déchets contenant des BPC (1996)</i> ; b) la vente, l'importation ou la publicité des liquides pour usage en microscopie qui contiennent des BPC, y compris les huiles à immersion mais à l'exclusion des huiles à indice de réfraction, interdites par l'article 4 de la <i>Loi sur les produits dangereux</i> ; c) la mise en vente, la vente et l'utilisation de terrains contaminés par des BPC ou des produits qui en contiennent.	Exclusion
Sale of property	<b>3.</b> Nothing in these Regulations shall be construed as preventing the sale of (a) personal property or movables that contain PCBs, or real property or immovables that have PCBs or products containing PCBs, and that form part of the sale of the whole or part of a business, including a manufacturing or a processing business; (b) real property or immovables that have products containing PCBs if the products continue to be used after the sale for the same purpose at the same place and are an integral part of the property or immovable; or (c) real property or immovables on which a PCB storage site is located.	<b>3.</b> Le présent règlement n'a pas pour effet d'empêcher la vente des biens suivants : a) tout bien meuble ou personnel qui contient des BPC ou tout bien immeuble ou réel où se trouvent des BPC ou des produits qui en contiennent, lesquels biens sont compris dans la vente de tout ou partie d'une entreprise, y compris une entreprise de fabrication ou de transformation; b) tout bien immeuble ou réel dont font partie intégralement les produits qui contiennent des BPC qui s'y trouvent, si les produits continuent d'être utilisés aux mêmes fins et au même endroit après la vente; c) tout bien immeuble ou réel où se trouve un dépôt de BPC.	Vente de biens
Compliance	<b>4.</b> In addition to the persons who must comply with the requirements set out in these Regulations, a person who owns PCBs or products containing PCBs shall ensure that the requirements of these Regulations with respect to those PCBs or products are met.	<b>4.</b> En plus des personnes auxquelles il incombe des obligations en vertu du présent règlement, le propriétaire de BPC ou de produits qui en contiennent veille à ce que les exigences du présent règlement concernant ces BPC ou produits soient remplies.	Conformité

**PART 2**  
**PROHIBITIONS AND PERMITTED ACTIVITIES**

**PROHIBITIONS**

Release into the environment	<b>5.</b> (1) No person shall release PCBs into the environment, other than from the equipment referred to in subsection (2), in a concentration of (a) 2 mg/kg or more for a liquid containing PCBs; or (b) 50 mg/kg or more for a solid containing PCBs.
Release from equipment	(2) No person shall release more than one gram of PCBs into the environment from equipment

**PARTIE 2**  
**INTERDICTIONS ET ACTIVITÉS PERMISES**

**INTERDICTIONS**

Rejet dans l'environnement	<b>5.</b> (1) Il est interdit de rejeter dans l'environnement, autrement qu'à partir d'une pièce d'équipement visée au paragraphe (2), des BPC de l'une ou l'autre des concentrations suivantes : a) dans le cas d'un liquide qui contient des BPC, une concentration égale ou supérieure à 2 mg/kg; b) dans le cas d'un solide qui contient des BPC, une concentration égale ou supérieure à 50 mg/kg.	Rejet dans l'environnement
Rejet à partir d'une pièce d'équipement	(2) Il est interdit de rejeter plus d'un gramme de BPC dans l'environnement à partir d'une pièce	Rejet à partir d'une pièce d'équipement

referred to in section 16 that is in use or from equipment in use for which an extension has been granted under section 17.

d'équipement visée à l'article 16 qui est en usage ou d'une pièce d'équipement dont l'usage fait l'objet d'une prolongation en vertu de l'article 17 et qui est en usage.

Prohibited activities

**6.** Except as provided in these Regulations, no person shall

- (a) manufacture, export or import PCBs or a product containing PCBs in a concentration of 2 mg/kg or more;
- (b) offer for sale or sell PCBs or a product containing PCBs in a concentration of 50 mg/kg or more; or
- (c) process or use PCBs or a product containing PCBs.

**6.** Sauf dans la mesure prévue par le présent règlement, il est interdit :

- a) de fabriquer, d'exporter ou d'importer des BPC ou tout produit qui en contient en une concentration égale ou supérieure à 2 mg/kg;
- b) de mettre en vente ou de vendre des BPC ou tout produit qui en contient en une concentration égale ou supérieure à 50 mg/kg;
- c) de transformer ou d'utiliser des BPC ou tout produit qui en contient.

Activités interdites

PERMITTED ACTIVITIES

ACTIVITÉS PERMISES

Laboratory analysis

**7.** A person may manufacture, export, import, offer for sale, sell, process and use PCBs or products containing PCBs for the purpose of laboratory analysis if the analysis is conducted

- (a) in an authorized facility that is authorized for that purpose; or
- (b) in a facility that conforms to internationally recognized guidelines on best laboratory practices, if the authorities of the jurisdiction in which the facility is located do not have a mechanism in place to authorize the facility to conduct the analysis.

**7.** Il est permis de fabriquer, d'exporter, d'importer, de mettre en vente, de vendre, de transformer et d'utiliser des BPC et des produits qui en contiennent pour des analyses de laboratoire, si celles-ci sont effectuées :

- a) dans toute installation agréée à cette fin;
- b) dans le cas où les autorités du territoire où elle est située ne disposent d'aucun mécanisme l'autorisant à les effectuer, dans toute installation qui est conforme à des lignes directrices, reconnues à l'échelle internationale, sur les pratiques exemplaires en laboratoire.

Analyses de laboratoire

Research

**8.** (1) A person may offer for sale or sell PCBs or products containing PCBs to be processed or used for the purpose of research to determine the effects of those PCBs or products on human health or on the environment, if the facility in which they are processed or used is

- (a) an authorized facility that is authorized for that purpose; or
- (b) a facility that conforms to internationally recognized guidelines on best laboratory practices, if the authorities of the jurisdiction in which the facility is located do not have a mechanism in place to authorize the facility to conduct the research.

**8.** (1) Il est permis de mettre en vente ou de vendre des BPC ou des produits qui en contiennent pour qu'ils soient utilisés ou transformés à des fins de recherche visant à déterminer les effets des BPC ou des produits sur la santé humaine ou l'environnement, si l'installation où ils sont utilisés ou transformés se conforme à l'une ou l'autre des exigences suivantes :

- a) elle est agréée à cette fin;
- b) dans le cas où les autorités du territoire où elle est située ne disposent d'aucun mécanisme l'autorisant à effectuer des recherches, elle est conforme à des lignes directrices, reconnues à l'échelle internationale, sur les pratiques exemplaires en laboratoire.

Recherches

Processing and use

(2) A person may process and use the PCBs or products containing PCBs for the purpose of the research referred to in subsection (1) at a facility that meets the requirement set out in paragraph (1)(a) or (b).

(2) Il est permis de transformer et d'utiliser des BPC et des produits qui en contiennent pour effectuer les recherches visées au paragraphe (1) dans une installation qui se conforme à l'une ou l'autre des exigences prévues à ce paragraphe.

Transformation et utilisation

Electrical capacitor

**9.** A person may offer for sale, sell and use an electrical capacitor containing PCBs if the electrical capacitor

- (a) is an integral part of a consumer product;
- (b) is fusion sealed; and
- (c) would be rendered inoperable and irreparable if the PCBs were removed from it.

**9.** Il est permis de mettre en vente, de vendre et d'utiliser tout condensateur électrique qui contient des BPC, si les conditions suivantes sont réunies :

- a) il fait partie intégrante d'un produit de consommation;
- b) ses joints sont thermoscellés;
- c) il ne fonctionnerait plus et serait irréparable si les BPC en étaient extraits.

Condensateurs électriques

Aircraft, ships, trains and other vehicles

**10.** A person may export, import, offer for sale, sell and use for transportation purposes aircraft, ships, trains and other vehicles that contain PCBs

**10.** Il est permis d'exporter, d'importer, de mettre en vente, de vendre et d'utiliser pour le transport, tout aéronef, navire, train ou autre véhicule

Aéronefs, navires, trains et autres véhicules

	only in their communication, navigation or electronic control equipment or cables.	dont seuls l'équipement de communication, de navigation ou de commande électronique ou les câbles contiennent des BPC.	
Colouring pigment	<b>11.</b> (1) A person may manufacture, export, import, offer for sale, sell, process and use a colouring pigment containing PCBs produced incidentally if the concentration of the PCBs is less than 50 mg/kg.	<b>11.</b> (1) Il est permis de fabriquer, d'exporter, d'importer, de mettre en vente, de vendre, de transformer et d'utiliser des pigments pour la coloration qui contiennent des BPC produit par inadvertance en une concentration inférieure à 50 mg/kg.	Pigments pour la coloration
Annual average concentration	(2) Despite subsection (1), the annual average concentration of PCBs produced incidentally in colouring pigment that a person may manufacture, export, import, offer for sale, sell, process and use shall not exceed 25 mg/kg.	(2) Toutefois, la concentration moyenne annuelle de BPC produit par inadvertance dans les pigments pour la coloration fabriqués, exportés, importés, mis en vente, vendus, transformés et utilisés par toute personne ne peut dépasser 25 mg/kg.	Moyenne annuelle maximale
Destruction	<b>12.</b> A person may process PCBs or products containing PCBs for the purpose of destroying PCBs or recovering PCBs for the purpose of destroying them in an authorized facility that is authorized for that purpose.	<b>12.</b> Il est permis, dans une installation agréée à cette fin, de transformer des BPC et des produits qui en contiennent pour les détruire ou pour les récupérer afin de les détruire.	Destruction
Solid products	<b>13.</b> (1) A person may manufacture solid products containing PCBs in a concentration of less than 50 mg/kg using bulk solid products containing PCBs in a concentration of less than 50 mg/kg, and may use those solid products.	<b>13.</b> (1) Il est permis de fabriquer des produits solides qui contiennent des BPC en une concentration inférieure à 50 mg/kg à partir de produits solides en vrac qui eux-mêmes contiennent des BPC en une concentration inférieure à 50 mg/kg et d'utiliser ces produits solides.	Produits solides
Application	(2) Subsection (1) only applies to the manufacture of the types of products that are manufactured before the day on which these Regulations come into force.	(2) Le paragraphe (1) ne s'applique qu'aux types de produits qui sont fabriqués avant l'entrée en vigueur du présent règlement.	Application
Exception	(3) No person shall offer for sale or sell the products manufactured in accordance with subsection (1) unless the products are used in the course of a commercial or industrial activity.	(3) Il est interdit de mettre en vente ou de vendre des produits fabriqués conformément au paragraphe (1) pour tout usage en dehors d'une activité commerciale ou industrielle.	Exception
Cables, pipelines, electrical capacitors and other equipment	<b>14.</b> (1) A person may use the following products containing PCBs: (a) cables, if they remain in place on the day on which these Regulations come into force; (b) pipelines that transport natural gas, petroleum or petroleum products and any associated equipment that is in contact with the natural gas, petroleum or petroleum products if the pipelines and the equipment remain in place on the day on which these Regulations come into force; (c) fusion sealed capacitors if they are used in relation to communication equipment or electronic control equipment; and (d) the following equipment containing PCBs in a concentration of less than 50 mg/kg if the equipment is used for the purpose for which it was manufactured: (i) electrical capacitors, other than light ballasts, and electrical transformers and their auxiliary electrical equipment, other than pole-top electrical transformers and their pole-top auxiliary electrical equipment, (ii) electromagnets that are not used in the handling of food, feed or any additive to food or feed, and	<b>14.</b> (1) Il est permis d'utiliser les produits ci-après qui contiennent des BPC : a) tout câble, s'il demeure à l'endroit où il se trouvait à l'entrée en vigueur du présent règlement; b) tout pipeline qui transporte du gaz naturel, du pétrole ou des produits pétroliers, ainsi que tout équipement connexe qui est en contact avec le gaz naturel, le pétrole ou les produits pétroliers, si le pipeline et l'équipement demeurent à l'endroit où ils se trouvaient à l'entrée en vigueur du présent règlement; c) tout condensateur électrique dont les joints sont thermoscellés et qui est utilisé à des fins de communication ou de commande électronique; d) les pièces d'équipement ci-après qui contiennent des BPC en une concentration inférieure à 50 mg/kg et qui sont utilisées aux fins auxquelles elles étaient destinées lors de leur fabrication : (i) les condensateurs électriques, autres que les ballasts de lampes, et les transformateurs électriques et tout équipement électrique connexe, à l'exception des transformateurs sur poteaux et de tout équipement électrique connexe sur poteaux,	Câbles, pipelines, condensateurs électriques et pièces d'équipements

(iii) heat transfer equipment, hydraulic equipment, vapour diffusion pumps and bridge bearings.

(ii) les électroaimants ne servant pas à la maintenance des aliments destinés aux humains ou aux animaux, ou de tout additif à ces aliments,

(iii) l'équipement caloporteur, l'équipement hydraulique, les pompes à diffusion de vapeur et les appareils d'appui de pont.

Electrical capacitors

(2) A person may import fusion sealed capacitors containing PCBs for use in relation to communication tactical equipment or electronic control tactical equipment.

(2) Il est permis d'importer tout condensateur électrique qui contient des BPC et dont les joints sont thermoscellés pour qu'il soit utilisé à des fins de communication tactique ou de commande électronique tactique.

Condensateurs électriques

Liquids for servicing — concentration less than 2 mg/kg

**15.** (1) A person may use liquids containing PCBs in a concentration of less than 2 mg/kg for the purpose of servicing equipment containing PCBs.

**15.** (1) Il est permis d'utiliser tout liquide qui contient des BPC en une concentration inférieure à 2 mg/kg pour l'entretien de toute pièce d'équipement qui contient des BPC.

Liquides pour entretien — concentration inférieure à 2 mg/kg

Liquids for servicing — concentration of 500 mg/kg or more

(2) A person may use liquids containing PCBs in a concentration of 500 mg/kg or more for the purpose of servicing equipment containing PCBs in a concentration of 500 mg/kg or more until December 31, 2009.

(2) Il est également permis, jusqu'au 31 décembre 2009, d'utiliser tout liquide qui contient des BPC en une concentration égale ou supérieure à 500 mg/kg pour l'entretien de toute pièce d'équipement qui elle-même contient des BPC en une concentration égale ou supérieure à 500 mg/kg.

Liquide pour entretien — concentration de 500 mg/kg ou plus

END-OF-USE DATES AND EXTENSION

UTILISATION — DATES LIMITES ET PROLONGATION

Equipment referred to in subparagraphs 14(1)(d)(i) to (iii)

**16.** (1) A person may use the equipment referred to in subparagraphs 14(1)(d)(i) to (iii) until the following dates if the equipment is in use on the day on which these Regulations come into force:

**16.** (1) Il est permis d'utiliser les pièces d'équipement visées aux sous-alinéas 14(1)d(i) à (iii) qui sont en usage à l'entrée en vigueur du présent règlement jusqu'aux dates suivantes :

Pièces d'équipement visées aux sous-alinéas 14(1)d(i) à (iii)

(a) in the case of equipment containing PCBs in a concentration of 500 mg/kg or more, December 31, 2009; and

a) si elles contiennent des BPC en une concentration égale ou supérieure à 500 mg/kg, jusqu'au 31 décembre 2009;

(b) in the case of equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg,

b) si elles contiennent des BPC en une concentration égale ou supérieure à 50 mg/kg mais inférieure à 500 mg/kg :

(i) December 31, 2009, if the equipment is located at a drinking water treatment plant or food or feed processing plant, in a child care facility, preschool, primary school, secondary school, hospital or senior citizens' care facility or on the property on which the plant or facility is located and within 100 m of it, and

(i) jusqu'au 31 décembre 2009, si elles se trouvent dans une usine de traitement d'eau potable ou de transformation des aliments destinés aux humains ou aux animaux, dans une garderie, dans une école — de niveau préscolaire, primaire ou secondaire —, dans un hôpital ou dans une résidence pour personnes âgées ou sur le terrain d'un tel établissement, à 100 m ou moins de celui-ci,

(ii) December 31, 2025, if the equipment is located at any other place.

(ii) jusqu'au 31 décembre 2025, si elles se trouvent à tout autre endroit.

Light ballasts and pole-top electrical transformers

(2) A person may use the following equipment containing PCBs in a concentration of 50 mg/kg or more until December 31, 2025, if the equipment is in use on the day on which these Regulations come into force:

(2) Il est permis, jusqu'au 31 décembre 2025, d'utiliser les pièces d'équipement ci-après qui sont en usage à l'entrée en vigueur du présent règlement et qui contiennent des BPC en une concentration égale ou supérieure à 50 mg/kg :

Ballasts de lampes et transformateurs sur poteaux

(a) light ballasts; and

a) les ballasts de lampes;

(b) pole-top electrical transformers and their pole-top auxiliary electrical equipment.

b) les transformateurs sur poteaux ainsi que tout équipement électrique connexe sur poteaux.

Liquid — concentration of 2 mg/kg or more

(3) A person may use a liquid containing 2 mg/kg or more of PCBs that is in equipment until the day on which the liquid is removed from the equipment.

(3) Il est permis d'utiliser tout liquide qui contient des BPC en une concentration égale ou supérieure à 2 mg/kg dans une pièce d'équipement jusqu'à ce qu'il en soit extrait.

Liquides — concentration de 2 mg/kg ou plus

Extension of end-of-use date	<p><b>17.</b> (1) Despite subsection 15(2), paragraph 16(1)(a) and subparagraph 16(1)(b)(i), a person may use the equipment and the liquids used for servicing that equipment, referred to in those provisions, until the date set out in an extension granted by the Minister under subsection (2) for that equipment and those liquids.</p>	<p><b>17.</b> (1) Malgré le paragraphe 15(2), l'alinéa 16(1)a) et le sous-alinéa 16(1)b)(i), il est permis d'utiliser les pièces d'équipement et les liquides utilisés pour leur entretien visés à ces dispositions jusqu'à l'expiration de toute prolongation accordée par le ministre en vertu du paragraphe (2) pour ces pièces d'équipement et ces liquides.</p>	<p>Prolongation de la date de fin d'utilisation</p>
Application	<p>(2) The Minister shall, on receiving a written application containing the information set out in subsection (3), grant an extension up to the date applied for but no later than December 31, 2014, if either of the following conditions are met:</p> <p>(a) the equipment is being replaced with equipment that is engineered to order, and</p> <p style="margin-left: 20px;">(i) it is not technically feasible to replace the equipment on or before December 31, 2009,</p> <p style="margin-left: 20px;">(ii) the applicant is taking all necessary measures to minimize or eliminate any harmful effect of the PCBs in the equipment on the environment and on human health,</p> <p style="margin-left: 20px;">(iii) a plan has been prepared, along with timelines, to end the use of the equipment by the date applied for,</p> <p style="margin-left: 20px;">(iv) a plan has been prepared for inspecting the equipment on a monthly basis for the period of the extension for damage that could lead to the release of PCBs, and</p> <p style="margin-left: 20px;">(v) the equipment bears the label required under section 29; or</p> <p>(b) the equipment is located at a facility that is scheduled for permanent closure on or before December 31, 2014, and</p> <p style="margin-left: 20px;">(i) the applicant is taking all necessary measures to minimize or eliminate any harmful effect of the PCBs in the equipment on the environment and on human health,</p> <p style="margin-left: 20px;">(ii) a plan has been prepared, along with timelines, to end the use of the equipment by the date applied for,</p> <p style="margin-left: 20px;">(iii) a plan has been prepared for inspecting the equipment on a monthly basis, for the period of the extension, for damage that could lead to the release of PCBs, and</p> <p style="margin-left: 20px;">(iv) the equipment bears the label required under section 29.</p>	<p>(2) Sur réception d'une demande écrite comportant les renseignements prévus au paragraphe (3), le ministre accorde une prolongation jusqu'à la date prévue dans la demande mais au plus tard jusqu'au 31 décembre 2014, si l'une ou l'autre des conditions suivantes est remplie :</p> <p>a) la pièce d'équipement doit être remplacée par une pièce d'équipement conçue et fabriquée sur mesure et :</p> <p style="margin-left: 20px;">(i) il est techniquement impossible de le faire le 31 décembre 2009 ou avant cette date,</p> <p style="margin-left: 20px;">(ii) le demandeur prend les mesures nécessaires pour éliminer ou atténuer tout effet nocif des BPC contenus dans la pièce sur l'environnement et la santé humaine,</p> <p style="margin-left: 20px;">(iii) un plan, incluant un échéancier, a été dressé afin que l'utilisation de la pièce cesse au plus tard à la date prévue dans la demande,</p> <p style="margin-left: 20px;">(iv) un plan a été dressé pour l'inspection de la pièce une fois par mois durant la prolongation afin que soit décelé tout dommage pouvant mener au rejet de BPC,</p> <p style="margin-left: 20px;">(v) la pièce porte l'étiquette exigée par l'article 29;</p> <p>b) la pièce d'équipement se trouve dans une installation dont la fermeture permanente est prévue au plus tard pour le 31 décembre 2014 et :</p> <p style="margin-left: 20px;">(i) le demandeur prend les mesures nécessaires pour éliminer ou atténuer tout effet nocif des BPC contenus dans la pièce sur l'environnement et la santé humaine,</p> <p style="margin-left: 20px;">(ii) un plan, incluant un échéancier, a été dressé afin que l'utilisation de la pièce cesse au plus tard à la date prévue dans la demande,</p> <p style="margin-left: 20px;">(iii) un plan a été dressé pour l'inspection de la pièce une fois par mois durant la prolongation afin que soit décelé tout dommage pouvant mener au rejet de BPC;</p> <p style="margin-left: 20px;">(iv) la pièce porte l'étiquette exigée par l'article 29.</p>	<p>Demande</p>
Information	<p>(3) The application shall contain the following:</p> <p>(a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the applicant and of any person authorized to act on the applicant's behalf;</p> <p>(b) a technical description of the equipment which is the subject of the application, including</p> <p style="margin-left: 20px;">(i) the type and function of the equipment,</p> <p style="margin-left: 20px;">(ii) the quantity of liquid containing PCBs that is in the equipment and the quantity of liquid needed for servicing that equipment, expressed in litres,</p>	<p>(3) La demande comporte :</p> <p>a) les nom, adresses municipale et postale et numéro de téléphone du demandeur et de toute personne autorisée à agir en son nom et, le cas échéant, leurs numéro de télécopieur et adresse électronique;</p> <p>b) les caractéristiques techniques de la pièce d'équipement qui fait l'objet de la demande, notamment :</p> <p style="margin-left: 20px;">(i) son type et sa fonction,</p> <p style="margin-left: 20px;">(ii) la quantité de liquide qui contient des BPC qui s'y trouve et la quantité de liquide nécessaire pour son entretien, exprimées en litres,</p>	<p>Renseignements</p>

	<p>(iii) the concentration of PCBs in the liquid, expressed in milligrams of PCBs per kilogram of liquid,</p> <p>(iv) the quantity of PCBs in the liquid that is in the equipment, expressed in kilograms, and</p> <p>(v) the name-plate description, if any, and the manufacturer's serial number, if any;</p> <p>(c) the unique identification number that is on the label required under section 29;</p> <p>(d) the name, if any, and civic address of the facility where the equipment is located, or, if there is no civic address, the location using the owner's site identification system, and the function and technical description of the facility;</p> <p>(e) information demonstrating that</p> <p>(i) it is not technically feasible to replace the equipment on or before December 31, 2009, or</p> <p>(ii) the facility where the equipment is located is scheduled for permanent closure on or before December 31, 2014;</p> <p>(f) information demonstrating that the applicant is taking all necessary measures to minimize or eliminate any harmful effect of the PCBs that are contained in the equipment on the environment and on human health;</p> <p>(g) the plan, along with timelines, for ending the use of the equipment; and</p> <p>(h) the plan for inspecting the equipment.</p>	<p>(iii) la concentration de BPC dans le liquide, exprimée en milligrammes de BPC par kilogramme de liquide,</p> <p>(iv) la quantité de BPC dans le liquide qui s'y trouve, exprimée en kilogrammes,</p> <p>(v) s'il y a lieu, l'information figurant sur la plaque d'identification et le numéro de série de son fabricant;</p> <p>c) le numéro d'identification unique figurant sur l'étiquette en application de l'article 29;</p> <p>d) le nom, s'il y a lieu, et l'adresse municipale de l'installation où se trouve la pièce d'équipement ou, à défaut, l'endroit où elle se trouve d'après le système d'identification de site du propriétaire, et la fonction et les caractéristiques techniques de l'installation;</p> <p>e) les renseignements qui établissent :</p> <p>(i) soit qu'il est techniquement impossible de remplacer la pièce d'équipement le 31 décembre 2009 ou avant cette date,</p> <p>(ii) soit que la fermeture permanente de l'installation dans laquelle se trouve la pièce d'équipement est prévue au plus tard pour le 31 décembre 2014;</p> <p>f) les renseignements qui établissent que les mesures nécessaires ont été prises par le demandeur pour éliminer ou atténuer tout effet nocif des BPC contenus dans la pièce d'équipement sur l'environnement et la santé humaine;</p> <p>g) le plan et l'échéancier qui seront mis en œuvre afin que cesse l'utilisation de la pièce d'équipement;</p> <p>h) le plan d'inspection de la pièce d'équipement.</p>	
Notice of change to information	(4) The applicant shall notify the Minister in writing of any change to the information provided under subsection (3) within 30 days after the day on which the change occurs.	(4) Le demandeur est tenu d'aviser le ministre par écrit de tout changement des renseignements fournis en application du paragraphe (3) dans les trente jours suivant la date du changement.	Avis de changement des renseignements
False or misleading information	(5) The Minister shall refuse to grant an extension if the Minister has reasonable grounds to believe that the applicant has provided false or misleading information in support of its application.	(5) Le ministre refuse d'accorder une prolongation s'il a des motifs raisonnables de croire que le demandeur a fourni des renseignements faux ou trompeurs au soutien de sa demande.	Renseignements faux ou trompeurs
Revocation	(6) The Minister shall revoke the extension if	(6) Il révoque la prolongation :	Révocation
	(a) the requirements set out in subsection (2) are no longer met during the period of the extension; or	a) si, durant la prolongation, les conditions prévues au paragraphe (2), selon le cas, ne sont plus remplies;	
	(b) the Minister has reasonable grounds to believe that the applicant has provided false or misleading information to the Minister in support of its application.	b) s'il a des motifs raisonnables de croire que le demandeur lui a fourni des renseignements faux ou trompeurs au soutien de sa demande.	
Reasons for revocation	(7) The Minister shall not revoke the extension unless the Minister provides the applicant with	(7) Il ne peut toutefois révoquer la prolongation que si, à la fois :	Motifs de révocation
	(a) written reasons for the revocation; and	a) il a avisé le titulaire par écrit des motifs de la révocation;	
	(b) an opportunity to be heard, by written representation, in respect of the revocation.	b) il lui a donné la possibilité de présenter des observations écrites au sujet de celle-ci.	

PART 3  
STORAGE

PARTIE 3  
STOCKAGE

Application — concentration of 50 mg/kg or more	<p><b>18.</b> (1) Subject to subsection (3), this Part applies to a solid or liquid product containing PCBs in a concentration of 50 mg/kg or more</p> <p>(a) that is in an amount equal to or greater than 100 L if the product is a liquid, or in an amount equal to or greater than 100 kg if the product is a solid; or</p> <p>(b) that is in a lesser amount if the product contains 1 kg or more of PCBs.</p>	<p><b>18.</b> (1) Sous réserve du paragraphe (3), la présente partie s'applique aux produits liquides ou solides qui contiennent des BPC en une concentration égale ou supérieure à 50 mg/kg et :</p> <p>a) dont la quantité est égale ou supérieure à 100 L, dans le cas d'un produit liquide, ou à 100 kg, dans le cas d'un produit solide;</p> <p>b) dont la quantité est moindre, si ces produits renferment 1 kg ou plus de BPC.</p>	Application — Concentration égale ou supérieure à 50 mg/kg
Determination of amount	<p>(2) For the purposes of subsection (1), the amount of PCBs or products containing PCBs is the aggregate of all amounts of PCBs and products that are located at a particular site.</p>	<p>(2) Pour l'application du paragraphe (1), la quantité de BPC ou de produits qui en contiennent correspond à la somme de toutes les quantités de BPC et de produits qui se trouvent dans un même emplacement.</p>	Détermination des quantités
Non-application	<p>(3) This Part does not apply in respect of the following products containing PCBs:</p> <p>(a) solid or liquid products that are processed daily or used;</p> <p>(b) pipelines that transport natural gas, petroleum or petroleum products, and any associated equipment that is in contact with the natural gas, petroleum or petroleum products, if they remain in place on the day on which these Regulations come into force; and</p> <p>(c) cables, if they remain in place on the day on which these Regulations come into force.</p>	<p>(3) La présente partie ne s'applique pas aux produits ci-après qui contiennent des BPC :</p> <p>a) les produits liquides ou solides qui sont transformés quotidiennement ou utilisés;</p> <p>b) tout pipeline qui transporte du gaz naturel, du pétrole ou des produits pétroliers, ainsi que tout équipement connexe qui est en contact avec le gaz naturel, le pétrole ou les produits pétroliers, si le pipeline et l'équipement demeurent à l'endroit où ils se trouvaient à l'entrée en vigueur du présent règlement;</p> <p>c) les câbles, s'ils demeurent à l'endroit où ils se trouvaient à l'entrée en vigueur du présent règlement.</p>	Exclusion
Requirement to store	<p><b>19.</b> (1) A person who owns, controls or possesses PCBs or products containing PCBs that are not processed daily or used shall, within 30 days after the day on which those PCBs or products are no longer processed or used or within 30 days after the day on which these Regulations come into force, whichever is later, either</p> <p>(a) send them for destruction to an authorized facility that is authorized for that purpose; or</p> <p>(b) store them at a PCB storage site for the period during which they are not processed daily or used.</p>	<p><b>19.</b> (1) Le propriétaire de BPC ou de produits qui en contiennent ou la personne qui en a la possession ou le contrôle est tenu, dans les trente jours suivant la date où ceux-ci cessent d'être transformés quotidiennement ou utilisés ou celle de l'entrée en vigueur du présent règlement, selon la plus tardive de ces dates :</p> <p>a) soit de les expédier pour qu'ils soient détruits dans une installation agréée à cette fin;</p> <p>b) soit de les stocker dans un dépôt de BPC pendant qu'ils ne sont pas transformés quotidiennement ou utilisés.</p>	Obligation de stocker
Remote from or no access to roadway	<p>(2) Despite subsection (1), if the PCBs or products containing PCBs are remote from a roadway system or if there is no access to a roadway system, the person who owns, controls or possesses the PCBs or products may store them at a PCB storage site as soon as feasible but no later than one year after the day on which they are not processed daily or used or one year after the day on which these Regulations come into force, whichever is later. That person shall use best management practices for them from the time that they cease to be processed daily or used until the time that they are stored at a PCB storage site.</p>	<p>(2) Si les BPC ou les produits qui en contiennent sont éloignés de tout système routier ou se trouvent à un endroit où il n'y a pas d'accès à un tel système, le propriétaire ou la personne peut les stocker dans un dépôt de BPC le plus tôt possible, sans toutefois dépasser un an à compter de la date où ils cessent d'être transformés quotidiennement ou utilisés ou celle de l'entrée en vigueur du présent règlement, selon la plus tardive de ces dates. Ils sont tenus d'appliquer des pratiques exemplaires de gestion pour les BPC et les produits dès qu'ils cessent d'être transformés quotidiennement ou utilisés, et ce, jusqu'à leur stockage dans un dépôt de BPC.</p>	Endroit éloigné ou inaccessible
Prohibition against storage	<p><b>20.</b> (1) Effective one year after the day on which these Regulations come into force, no person shall store PCBs or products containing PCBs at the</p>	<p><b>20.</b> (1) À compter d'un an après la date d'entrée en vigueur du présent règlement, il est interdit de stocker des BPC ou des produits qui en contiennent</p>	Interdiction de stocker

	<p>following plants or facilities or on the land on which those plants or facilities are located and within 100 m of them:</p> <p>(a) a drinking water treatment plant or a food or feed processing plant; or</p> <p>(b) a child care facility, preschool, primary school, secondary school, hospital, or senior citizens' care facility.</p>	<p>dans l'un des établissements ci-après ou sur le terrain d'un tel établissement, à 100 m ou moins de celui-ci :</p> <p>a) une usine de traitement d'eau potable ou de transformation des aliments destinés aux humains ou aux animaux;</p> <p>b) une garderie, une école — de niveau préscolaire, primaire ou secondaire —, un hôpital ou une résidence pour personnes âgées.</p>	
Light ballasts	(2) Subsection (1) does not apply to light ballasts.	(2) Le paragraphe (1) ne s'applique pas aux ballasts de lampes.	Ballasts de lampes
Maximum storage periods	<p><b>21.</b> (1) Despite any other provision in these Regulations and subject to section 22, no person shall store PCBs or products containing PCBs, other than those referred to in section 23, beyond the following time limits:</p> <p>(a) one year, beginning on the day on which their use is no longer permitted under these Regulations or the day on which they are no longer processed daily or used, whichever is sooner, if the PCBs or products are stored at a facility that is not referred to in paragraph (1)(b) or (c);</p> <p>(b) one year, if the PCBs or products are stored at an authorized facility that is a transfer site; and</p> <p>(c) two years, if the PCBs or products are stored at an authorized facility that is authorized to destroy them.</p>	<p><b>21.</b> (1) Malgré toute autre disposition du présent règlement mais sous réserve de l'article 22, il est interdit de stocker des BPC et des produits qui en contiennent, autres que ceux visés à l'article 23, au-delà de la période applicable suivante :</p> <p>a) un an à compter du jour où le présent règlement ne permet plus l'utilisation des BPC et des produits ou de celui, s'il est antérieur, où ils ont cessé d'être transformés quotidiennement ou utilisés, s'ils sont stockés à une installation qui n'est pas visée aux alinéas (1)b) ou c);</p> <p>b) un an, s'ils sont stockés dans une installation agréée qui est un centre de transfert;</p> <p>c) deux ans, s'ils sont stockés dans une installation agréée qui est autorisée à les détruire.</p>	Périodes maximales de stockage
Transfer sites	(2) If the PCBs or products containing PCBs are sent from one transfer site to another, the period referred to in paragraph (1)(b) begins when they are received at the first transfer site.	(2) Si les BPC et les produits qui en contiennent sont expédiés d'un centre de transfert à un autre, la période prévue à l'alinéa (1)b) commence à courir le jour de leur réception au premier centre de transfert.	Centres de transfert
Destruction	(3) The owner or operator of the facility referred to in paragraph (1)(a) or (b) shall send the PCBs or products containing PCBs for destruction to an authorized facility that is authorized for that purpose within the time limit set out in those paragraphs.	(3) Le propriétaire ou l'exploitant de l'installation visée aux alinéas (1)a) ou b) est tenu d'expédier, dans le délai prévu à ces alinéas, les BPC ou les produits qui en contiennent pour qu'ils soient détruits dans une installation agréée à cette fin.	Destruction
Exceptions to maximum storage periods	<p><b>22.</b> (1) Section 21 does not apply to the storage of</p> <p>(a) liquids referred to in subsection 15(2) or for which an extension has been granted under subsection 17; or</p> <p>(b) solids and liquids containing PCBs in a concentration of 50 mg/kg or more resulting from environmental restoration work and stored on site for the duration of the work, if the requirements set out in subsections (2) and (3) are complied with.</p>	<p><b>22.</b> (1) L'article 21 ne s'applique pas au stockage :</p> <p>a) des liquides visés au paragraphe 15(2) ou pour lesquels une prolongation a été accordée en vertu de l'article 17;</p> <p>b) des solides et des liquides qui contiennent des BPC en une concentration égale ou supérieure à 50 mg/kg et qui sont issus de travaux de restauration de l'environnement et stockés sur place pendant la durée des travaux, si les exigences prévues aux paragraphes (2) et (3) sont respectées.</p>	Périodes maximales de stockage — exceptions
Information to be provided	<p>(2) The owner of the land where the solids and liquids referred to in paragraph (1)(b) are located shall submit to the Minister at least 30 days before the storage of the solids or liquids or within 30 days after the day on which these Regulations come into force, whichever is later, the following information:</p> <p>(a) the civic address of the restoration work site or if there is no civic address, the location using the Global Positioning System;</p> <p>(b) the date of commencement of the restoration work;</p> <p>(c) the anticipated date of completion of the restoration work; and</p>	<p>(2) Le propriétaire du terrain où se trouvent les solides ou les liquides visés à l'alinéa (1)b) fournit au ministre, au plus tard trente jours avant la date de leur stockage ou après celle de l'entrée en vigueur du présent règlement, selon la plus tardive de ces dates, les renseignements suivants :</p> <p>a) l'adresse municipale de l'endroit où sont effectués les travaux de restauration ou, à défaut, sa localisation d'après le système mondial de localisation;</p> <p>b) la date de début des travaux de restauration;</p> <p>c) la date prévue pour la fin des travaux de restauration;</p>	Renseignements à fournir

Changes to information	<p>(d) the anticipated date of the end of storage of the solids or liquids.</p> <p>(3) The person referred to in subsection (2) shall notify the Minister in writing of the changes to be made at least 30 days before making any changes to the information provided under that subsection.</p>	<p>d) la date prévue pour la cessation du stockage des solides ou des liquides.</p> <p>(3) Il avise également le ministre par écrit, au moins trente jours à l'avance, de toute modification apportée aux renseignements fournis.</p>	Modification des renseignements
PCBs or products containing PCBs stored at the coming into force	<p><b>23.</b> The person who owns PCBs or products containing PCBs, other than liquids for which an extension has been granted under section 17, that are stored on the day on which these Regulations come into force shall send them no later than December 31, 2009 for destruction to an authorized facility that is authorized for that purpose.</p>	<p><b>23.</b> Le propriétaire de BPC ou de produits qui en contiennent, autres que des liquides pour lesquels une prolongation a été accordée en vertu de l'article 17, qui sont stockés à l'entrée en vigueur du présent règlement est tenu de les expédier, au plus tard le 31 décembre 2009, pour qu'ils soient détruits dans une installation agréée à cette fin.</p>	BPC et produits qui en contiennent stockés à l'entrée en vigueur
PCB storage site	<p><b>24.</b> PCBs or products containing PCBs shall be stored at a site that is</p> <p>(a) a building, room, shipping container or other enclosed structure; or</p> <p>(b) an area that is enclosed by a woven mesh wire fence or any other fence or wall with similar security characteristics, and the fence or wall shall be at least 1.83 m high.</p>	<p><b>24.</b> Les BPC et les produits qui en contiennent doivent être stockés dans un dépôt qui est :</p> <p>a) soit un bâtiment, une pièce, un conteneur ou tout autre ouvrage fermé;</p> <p>b) soit un endroit entouré d'une clôture grillagée ou d'un autre genre de clôture ou d'un mur présentant des caractéristiques similaires sur le plan de la sécurité, la clôture ou le mur ayant au moins 1,83 m de haut.</p>	Dépôt de BPC
Storage requirements	<p><b>25.</b> The owner or operator of a PCB storage site shall</p> <p>(a) store all PCBs or products containing PCBs that are in liquid form in</p> <p>(i) sealed containers, other than drums, that are made of steel or other metals that provide sufficient durability and strength to prevent those PCBs or products from being affected by the weather or released, or</p> <p>(ii) drums that are</p> <p>(A) of a capacity not greater than 205 L,</p> <p>(B) a closed-head double-bung drum made of steel having a gauge of 16 or heavier, and</p> <p>(C) painted or treated to prevent rusting;</p> <p>(b) store all PCBs or products containing PCBs that are in solid form in</p> <p>(i) containers, other than drums, that are made of steel or other materials that provide sufficient durability and strength to prevent those PCBs or products from being affected by the weather or released, or</p> <p>(ii) drums that are</p> <p>(A) of a capacity not greater than 205 L,</p> <p>(B) made of steel having a gauge of 18 or heavier,</p> <p>(C) equipped with a securely attached, removable steel lid and a gasket made of material that is resistant to the PCBs or the products containing PCBs that are stored in the drums, and</p> <p>(D) painted or treated to prevent rusting;</p> <p>(c) store equipment containing PCB liquids in</p> <p>(i) containers, other than drums, that are made of steel or other materials that provide sufficient durability and strength to prevent the equipment from being affected by the weather and</p>	<p><b>25.</b> Le propriétaire ou l'exploitant d'un dépôt de BPC :</p> <p>a) stocke les BPC et les produits en contenant qui sont des liquides dans :</p> <p>(i) soit des contenants étanches, autres que des fûts, faits d'acier ou d'autres métaux offrant une durabilité et une solidité suffisantes pour que ces BPC et ces produits ne soient pas affectés par les conditions climatiques ni rejetés,</p> <p>(ii) soit des fûts qui, à la fois :</p> <p>(A) ont une capacité d'au plus 205 L,</p> <p>(B) sont faits d'acier d'épaisseur minimale 16, ont un dessus non amovible et sont munis de deux bondes,</p> <p>(C) sont enduits d'une peinture ou d'un revêtement anti-rouille;</p> <p>b) stocke les BPC et les produits en contenant qui sont des solides dans :</p> <p>(i) soit des contenants, autres que des fûts, faits d'acier ou d'autres matériaux offrant une durabilité et une solidité suffisantes pour que ces BPC et ces produits ne soient pas affectés par les conditions climatiques ni rejetés,</p> <p>(ii) soit des fûts qui, à la fois :</p> <p>(A) ont une capacité d'au plus 205 L,</p> <p>(B) sont faits d'acier d'épaisseur minimale 18,</p> <p>(C) sont dotés d'un couvercle d'acier amovible solidement fixé et d'un joint fait d'un matériau résistant aux BPC et aux produits en contenant qui y sont stockés,</p> <p>(D) sont enduits d'une peinture ou d'un revêtement anti-rouille;</p> <p>c) stocke les pièces d'équipement qui renferment des liquides contenant des BPC dans :</p> <p>(i) soit des contenants, autres que des fûts, faits d'acier ou d'autres matériaux offrant une</p>	Exigences relatives au stockage

- to prevent any PCB liquid that leaks from the equipment from being released, or
- (ii) drums described in subparagraph (b)(ii);
- (d) store all equipment that is not in a container, other than drained equipment, if that equipment contains PCB liquid, and all containers of PCB liquid, on a floor or surface that is made of steel, concrete or any other similar durable material and that is constructed with curbing or sides that are capable of containing
- (i) if one piece of equipment or one container is being stored, 125% of the volume of the PCB liquid in the equipment or container, and
- (ii) if more than one piece of equipment or more than one container is being stored, the greater of twice the volume of the PCB liquid in the largest piece of equipment or the largest container and 25% of the volume of all the PCB liquid stored on the floor or surface;
- (e) if the material of the floor or surface or the curbing or sides referred to in paragraph (d) are capable of absorbing any PCB liquid or other product containing PCBs, seal the floor, surface, curbing or sides with an impervious, durable, PCB-resistant coating;
- (f) ensure that all floor drains, sumps or other openings in the floor or surface referred to in paragraph (d) are
- (i) closed and sealed to prevent the release of liquids, or
- (ii) connected to a drainage system suitable for liquid dangerous goods that terminates at a location where any spilled liquids will be contained and recovered and where the spilled liquids will not create a fire hazard or a risk to public health or safety;
- (g) place on skids or pallets all equipment containing PCBs and containers of PCBs or products containing PCBs that are not permanently secured to the floor or a surface;
- (h) stack containers of PCBs and products containing PCBs, other than drums, only if the containers are designed for stacking, and stack containers of PCB liquid not more than two containers high;
- (i) if drums containing PCBs or products containing PCBs are stacked, separate the drums from each other with pallets and, in the case of drums of PCB liquid, stack the drums not more than two drums high;
- (j) store equipment containing PCBs, and containers of PCBs or products containing PCBs, in a manner that makes them accessible for inspection;
- (k) store PCBs or products containing PCBs in a manner that prevents them from catching fire or being released;
- (l) store PCBs or products containing PCBs together, and separate them from other stored materials;
- durabilité et une solidité suffisantes pour que les pièces d'équipement ne soient pas affectées par les conditions climatiques et que les liquides, s'ils fuient des pièces, ne soient pas rejetés,
- (ii) soit des fûts visés au sous-alinéa b)(ii);
- d) stocke les pièces d'équipement — autres que celles contenant des BPC qui ont été vidangées — qui ne sont pas dans un contenant et qui renferment des liquides contenant des BPC, ainsi que tout contenant qui renferme de tels liquides, sur un plancher ou une surface fait d'acier, de béton ou d'un autre matériau durable semblable et entouré d'un rebord ou de côtés capables de retenir :
- (i) si une seule pièce d'équipement ou un seul contenant est stocké, 125 % du volume des liquides contenant des BPC que renferme cette pièce d'équipement ou le contenant,
- (ii) si plus d'une pièce d'équipement ou plus d'un contenant est stocké, le plus élevé des volumes suivants : le double du volume des liquides contenant des BPC que renferme la plus grosse pièce d'équipement ou le plus grand contenant ou 25 % du volume de l'ensemble des liquides contenant des BPC qui sont stockés sur le plancher ou la surface;
- e) scelle, au moyen d'un revêtement étanche, durable et résistant aux BPC, le plancher, la surface, le rebord ou les côtés visés à l'alinéa d), lorsqu'ils peuvent absorber des liquides ou d'autres produits qui contiennent des BPC;
- f) veille à ce que les drains de sol, puisards et autres ouvertures dans le plancher ou la surface visés à l'alinéa d) soient, selon le cas :
- (i) obturés et scellés pour empêcher le rejet de liquides,
- (ii) reliés à un réseau de drainage convenant aux marchandises dangereuses liquides, qui se jette dans un lieu où les liquides déversés seront confinés et récupérés et où ils ne constitueront pas un risque d'incendie ni un risque pour la santé et la sécurité publiques;
- g) place sur des patins ou des palettes les pièces d'équipement contenant des BPC et les contenants renfermant des BPC ou des produits en contenant qui ne sont pas fixés de façon permanente à un plancher ou à une surface;
- h) empile les contenants de BPC et de produits qui en contiennent, autres que les fûts, seulement s'ils sont conçus à cette fin et, dans le cas des contenants renfermant des liquides qui contiennent des BPC, ne les empile pas à plus de deux contenants de haut;
- i) s'ils sont empilés, sépare les fûts de BPC et de produits qui en contiennent les uns des autres avec des palettes et, dans le cas des fûts renfermant des liquides qui contiennent des BPC, ne les empile pas à plus de deux fûts de haut;

(m) if reasonably practicable, equip any indoor PCB storage site having a mechanical exhaust system with heat or smoke sensory controls that stop the fan and close the intake and exhaust dampers in the event of a fire;

(n) if equipment or containers of PCB liquid are stored outdoors, cover all PCB equipment that is not in a container, other than drained equipment, if that equipment contains PCB liquid, and all containers of PCB liquid, with a weatherproof roof or barrier that protects the equipment and containers and prevents rain or snow from entering the curbing and the sides of the floor and the surface under them; and

(o) ensure that all drained PCB equipment and all containers of any PCB solid or PCB equipment are structurally sound and weatherproof if stored outdoors.

j) stocke les pièces d'équipement qui contiennent des BPC et les contenants renfermant des BPC ou des produits qui en contiennent de manière à ce qu'ils soient accessibles à des fins d'inspection;

k) stocke les BPC et les produits qui en contiennent de façon à empêcher leur inflammation ou leur rejet;

l) stocke les BPC et les produits qui en contiennent ensemble, à l'écart des autres matériaux stockés;

m) dans la mesure du possible, munit tout dépôt de BPC intérieur ayant un dispositif mécanique de ventilation de commandes sensibles à la chaleur ou à la fumée qui, en cas d'incendie, arrêtent le ventilateur et ferment les registres d'admission et d'évacuation d'air;

n) s'ils sont stockés dehors, couvre les pièces d'équipement — autres que celles contenant des BPC qui ont été vidangées — qui ne sont pas dans un contenant et qui renferment des liquides contenant des BPC, ainsi que tout contenant qui renferme de tels liquides, d'une toiture ou d'un écran à l'épreuve des intempéries qui les protège et empêche la pluie et la neige de pénétrer à l'intérieur du rebord et des côtés du plancher et de la surface sur lesquels ils sont posés;

o) s'ils sont stockés dehors, veille à ce que les pièces d'équipement contenant des BPC qui ont été vidangées et tout contenant qui renferme des solides ou des pièces d'équipement contenant des BPC aient une structure en bon état et soient à l'épreuve des intempéries.

Access to PCB storage site

**26.** The owner or operator of a PCB storage site shall keep all points of access to the PCB storage site locked or guarded.

Inspection and maintenance of a PCB storage site

**27.** The owner or operator of a PCB storage site shall

(a) inspect all floors, curbing, sides, drains, drainage systems, weatherproof roofs and barriers, fences and walls of the PCB storage site, any fire alarm system, fire extinguishers and fire suppression system and all equipment containing PCBs, containers used for the storage of PCBs or products containing PCBs and materials for clean-up at the PCB storage site

(i) each month,

(ii) at intervals of more than one month, if the Minister, on the written request of the owner or operator, determines that it is not reasonably practicable to inspect the site each month, due to its remote location, or

(iii) at intervals of less than one month, if more frequent inspections are necessary for the safe operation of the site; and

(b) keep in good condition and, if damaged, immediately repair or replace the floors, curbing, sides, drains, drainage systems, weatherproof roofs or barriers, fences, walls, fire alarm system, fire extinguishers, fire suppression system, equipment containing PCBs and containers and immediately clean up any contaminated area.

Accès au dépôt de BPC

**26.** Le propriétaire ou l'exploitant d'un dépôt de BPC tient chaque point d'accès au dépôt verrouillé ou veille à ce qu'il soit gardé.

**27.** Le propriétaire ou l'exploitant d'un dépôt de BPC :

a) en inspecte les planchers, les rebords, les côtés, les drains, les réseaux de drainage, les toitures et écrans à l'épreuve des intempéries, les clôtures, les murs, le système d'alarme-incendie, les extincteurs et le réseau d'extinction automatique, ainsi que les pièces d'équipement qui contiennent des BPC, les contenants servant au stockage des BPC ou des produits qui en contiennent et les agents de nettoyage qui s'y trouvent :

(i) tous les mois,

(ii) à des intervalles de plus d'un mois, si le ministre, à la demande écrite du propriétaire ou de l'exploitant, a déterminé qu'il est en pratique impossible d'inspecter le dépôt tous les mois en raison de son isolement,

(iii) à des intervalles de moins d'un mois, si l'exploitation du dépôt en toute sécurité exige des inspections plus fréquentes;

b) les garde en bon état et, en cas de dommage, les répare ou les remplace immédiatement et nettoie sur-le-champ les aires contaminées.

Inspection et entretien des dépôts de BPC

Fire protection and emergency procedures

**28.** (1) The owner or operator of a PCB storage site shall

(a) develop and implement at the PCB storage site a fire protection and emergency procedures plan and shall

- (i) update and test the plan once per year,
- (ii) keep a written copy of the latest plan at the PCB storage site and another at their principal place of business, and
- (iii) make the latest plan readily available to persons who implement the plan and to the local fire department or to the local officer appointed by the provincial Fire Marshall if there is no local fire department or to any other local authority responsible for fire protection;

(b) ensure that all employees who are authorized to enter the PCB storage site are familiar with the contents of the latest plan;

(c) equip the indoor PCB storage site with a fully operative fire alarm system that is maintained, inspected and tested in accordance with articles 6.3.1.1 and 6.3.1.2 of the National Fire Code and with

- (i) portable fire extinguishers that are selected and installed in accordance with article 2.1.5.1 of the National Fire Code and maintained, inspected and tested in accordance with article 6.2.1.1 of that Code, or
- (ii) an automatic fire suppression system that meets the requirements of article 3.2.7.9 of the National Fire Code, if required;

(d) keep a copy of the records referred to in sections 43 and 44 at the PCB storage site and make a copy readily available to the local fire department and, if there is no local fire department, to the local officer appointed by the provincial Fire Marshall or to any other local authority responsible for fire protection;

(e) ensure that all employees who are authorized to enter the PCB storage site are made aware of the hazards of PCBs and are familiar with the use of protective equipment and clothing and the clean-up procedures referred to in the *Guidelines for the Management of Wastes Containing Polychlorinated Biphenyls (PCBs)*, CCME-TS/WM-TRE008, September 1989, as amended from time to time, issued by the Canadian Council of Ministers of the Environment; and

(f) store absorbent materials for clean-up near the PCB storage site.

(2) Despite paragraph (1)(c), if the indoor PCB storage site is a shipping container, the owner or operator of the site does not have to equip that site with a fire alarm system.

Shipping containers

**28.** (1) Le propriétaire ou l'exploitant d'un dépôt de BPC :

a) élabore et met en œuvre un plan d'intervention d'urgence et de lutte contre les incendies et :

- (i) le met à jour et le vérifie annuellement,
- (ii) en conserve une copie écrite à jour au dépôt et à son établissement principal,
- (iii) en met une copie à jour à la disposition de toute personne qui participe à sa mise en œuvre et au service d'incendie local ou, à défaut, au fonctionnaire local nommé par le commissaire provincial aux incendies ou à toute autre autorité locale chargée de la protection contre les incendies,

b) veille à ce que tous les employés autorisés à entrer dans le dépôt connaissent bien le contenu du plan à jour;

c) s'agissant d'un dépôt intérieur, le munit d'un système d'alarme-incendie en état de fonctionnement qui est entretenu, inspecté et mis à l'essai conformément aux exigences des articles 6.3.1.1 et 6.3.1.2 du Code national de prévention des incendies, ainsi que :

- (i) soit d'extincteurs portatifs qui sont choisis et installés conformément à l'article 2.1.5.1 de ce code et qui sont entretenus, inspectés et mis à l'essai conformément aux exigences de l'article 6.2.1.1 de ce code,
- (ii) soit d'un réseau d'extinction automatique conforme aux exigences de l'article 3.2.7.9 du même code, si celles-ci s'appliquent;

d) conserve au dépôt une copie des documents et registres visés aux articles 43 et 44 respectivement et en met une à la disposition du service d'incendie local ou, à défaut, au fonctionnaire local nommé par le commissaire provincial aux incendies ou à toute autre autorité locale chargée de la protection contre les incendies;

e) veille à ce que tous les employés autorisés à entrer dans le dépôt soient informés des dangers que présentent les BPC et connaissent bien l'utilisation du matériel et des vêtements de protection et les méthodes de nettoyage mentionnées dans le *Guide pour la gestion des déchets contenant des biphényles polychlorés (BPC)* CCME-TS/WM-TRE008, septembre 1989, avec ses modifications successives, publié par le Conseil canadien des ministres de l'environnement;

f) garde les matériaux absorbants servant au nettoyage près du dépôt.

(2) Malgré l'alinéa (1)c), le propriétaire ou l'exploitant d'un dépôt de BPC intérieur qui est un conteneur n'est pas tenu de le munir d'un système d'alarme-incendie.

Protection contre les incendies et mesures d'urgence

Conteneur

PART 4

LABELLING, REPORTS AND RECORDS

LABELLING

Equipment and liquids used for their servicing

**29.** (1) The owner of equipment referred to in section 16, other than equipment for which an extension has been applied for under section 17, or of a liquid used in its servicing referred to in subsection 15(2) shall affix a label in a readily visible location on the equipment or on the container of the liquid, no later than 30 days after the day on which it ceases to be used.

Equipment for which extension applied for

(2) The owner of equipment for which an extension has been applied under section 17 shall affix a label in a readily visible location on the equipment.

Exceptions

(3) Subsection (1) does not apply to  
 (a) equipment or containers of liquids that bear a label on the day on which these Regulations come into force that indicates the presence of PCBs; and  
 (b) equipment that is too small, including light ballasts, to bear the label referred to in subsection (4), until the day on which they cease to be used and are placed in a container that bears the label.

Description

(4) The label must  
 (a) state “ATTENTION — contains 50 mg/kg or more of PCBs / contient 50 mg/kg ou plus de BPC” in black lettering on a white background, in a font size of no less than 36 points;  
 (b) measure at least 150 mm by 150 mm or at least 76 mm by 76 mm in the case of capacitors; and  
 (c) in the case of equipment for which an extension is applied for under section 17, state a unique identification number.

Cables and pipelines

**30.** (1) The owner of a cable, a pipeline or equipment associated with a pipeline, referred to in paragraphs 14(1)(a) and (b), containing PCBs in a concentration of 50 mg/kg or more that is in a room, a tunnel or a facility shall either

(a) affix the label in the form set out in subsection 29(4) in a readily visible location on a part of the cable, pipeline or associated equipment that is accessible; or  
 (b) place a notice in a readily visible location at the entrance of the room, tunnel or facility that states the information set out in paragraph 29(4)(a) and measures at least 150 mm by 150 mm.

If dismantled

(2) If a part of the cable, pipeline or associated equipment is dismantled, the owner of the cable, pipeline or associated equipment shall affix on each dismantled part the label in the form set out in

PARTIE 4

ÉTIQUETAGE, RAPPORTS ET DOSSIERS

ÉTIQUETAGE

Pièces d'équipement et liquides pour leur entretien

**29.** (1) Le propriétaire d'une pièce d'équipement visée à l'article 16, autre qu'une pièce d'équipement qui fait l'objet d'une demande de prolongation en vertu de l'article 17, ou de tout liquide utilisé pour l'entretien visé au paragraphe 15(2) est tenu d'apposer une étiquette, à un endroit bien en vue sur la pièce d'équipement ou le contenant du liquide, au plus tard trente jours après que la pièce ou le contenant cesse d'être utilisé.

(2) Le propriétaire d'une pièce d'équipement qui fait l'objet d'une demande de prolongation en vertu de l'article 17 est tenu d'y apposer une étiquette à un endroit bien en vue.

Équipement faisant l'objet d'une demande de prolongation

(3) Le paragraphe (1) ne s'applique pas :

a) aux pièces d'équipement et aux contenants de liquide qui portent, à l'entrée en vigueur du présent règlement, une étiquette qui indique la présence de BPC;  
 b) aux pièces d'équipement qui sont trop petites, y compris les ballasts de lampes, pour que l'étiquette visée au paragraphe (4) y soit apposée, jusqu'à ce qu'elles cessent d'être utilisées et qu'elles soient placées dans un contenant sur lequel l'étiquette est apposée.

Exceptions

(4) L'étiquette doit :

a) porter la mention « ATTENTION — contains 50 mg/kg or more of PCBs / contient 50 mg/kg ou plus de BPC », inscrite en caractères d'au moins 36 points, en noir sur fond blanc;  
 b) être d'une dimension minimale de 150 mm sur 150 mm ou, dans le cas d'un condensateur, 76 mm sur 76 mm;  
 c) dans le cas d'une pièce d'équipement qui fait l'objet d'une demande de prolongation en vertu de l'article 17, porter un numéro d'identification unique.

Description

**30.** (1) Le propriétaire de câbles, de pipelines ou d'équipement connexe visés aux alinéas 14(1)(a) et (b) qui contiennent des BPC en une concentration égale ou supérieure à 50 mg/kg et se trouvent dans une pièce, un tunnel ou une installation est tenu :

a) soit d'apposer une étiquette conforme au paragraphe 29(4) à un endroit bien en vue sur toute partie accessible du câble, pipeline ou équipement connexe;  
 b) soit de placer à l'entrée de la pièce, du tunnel ou de l'installation à un endroit bien en vue une affiche d'une dimension minimale de 150 mm sur 150 mm portant la mention prévue à l'alinéa 29(4)a).

Câbles et pipelines

(2) En cas de désassemblage d'une partie du câble, du pipeline ou de l'équipement connexe, le propriétaire de ceux-ci est tenu, dans les trente jours suivant le désassemblage, d'apposer une étiquette

Désassemblage

subsection 29(4), no later than 30 days after the day on which it is dismantled.

conforme au paragraphe 29(4) sur chaque partie désassemblée du câble, du pipeline ou de l'équipement connexe.

A facility other than transfer site or destruction facility

**31.** (1) The owner or operator of a PCB storage site, other than the PCB storage site of an authorized facility that is a transfer site or that is authorized to destroy PCBs, shall affix a label in a readily visible location on any product containing PCBs in a concentration of 50 mg/kg or more and that are stored at the PCB storage site, which

**31.** (1) Le propriétaire ou l'exploitant d'un dépôt de BPC d'une installation autre qu'une installation agréée qui est un centre de transfert ou qui est autorisée à détruire des BPC est tenu d'apposer une étiquette à un endroit bien en vue sur tout produit en contenant qui y sont stockés et qui contiennent des BPC en une concentration égale ou supérieure à 50 mg/kg; l'étiquette

Installation autre qu'un centre de transfert ou de destruction

(a) is in the form referred to in subsection 29(4); and

a) est conforme au paragraphe 29(4);

(b) states "Date of Commencement of Storage" and the date on which the storage begins.

b) porte la mention « Date de début de stockage » et la date de début de stockage.

Transfer site or destruction facility

(2) The owner or operator of the PCB storage site of an authorized facility that is a transfer site or that is authorized to destroy PCBs shall affix a label in the form set out in subsection 29(4) in a readily visible location on any container that is a fixed tank and that is used at the facility for the storage of PCBs or products containing PCBs in a concentration of 50 mg/kg or more.

(2) Le propriétaire ou l'exploitant d'un dépôt de BPC d'une installation agréée qui est un centre de transfert ou qui est autorisée à détruire des BPC est tenu d'apposer une étiquette conforme au paragraphe 29(4) à un endroit bien en vue sur tout contenant qui est un réservoir fixe utilisé pour stocker des BPC à l'installation ou des produits qui en contiennent en une concentration égale ou supérieure à 50 mg/kg.

Centre de transfert ou de destruction

Notice

(3) The owner or operator of a PCB storage site shall place a notice in a readily visible location at the entrance of the site that states the information set out in paragraph 29(4)(a) and that measures at least 150 mm by 150 mm.

(3) Le propriétaire ou l'exploitant d'un dépôt de BPC place à l'entrée du dépôt à un endroit bien en vue une affiche d'une dimension minimale de 150 mm sur 150 mm portant la mention prévue à l'alinéa 29(4)a).

Affiche

Exception

(4) Subsections (1) and (2) do not apply if the product or the container bear a label on the day on which these Regulations come into force that indicates the presence of PCBs and that states "Date of Commencement of Storage" and the date on which the storage begins.

(4) Les paragraphes (1) et (2) ne s'appliquent pas si le produit ou le contenant porte, à l'entrée en vigueur du présent règlement, une étiquette qui indique la présence de BPC, qui porte la mention « Date de début de stockage » et indique la date de début de stockage.

Exception

Retention of labels

**32.** The person who is required to affix a label on a product or container in accordance with sections 29 to 31 shall ensure that it bears that label for the duration that the person possesses the product or container.

**32.** La personne qui a l'obligation d'apposer une étiquette sur un produit ou un contenant en application des articles 29 à 31 veille à ce que le produit ou le contenant la porte en tout temps pendant qu'il est en sa possession.

Conservation des étiquettes

REPORTS

RAPPORTS

End of use of equipment and liquids — 2009

**33.** (1) The owner of the equipment referred to in paragraph 16(1)(a) and subparagraph 16(1)(b)(i), other than the equipment for which an extension is granted by the Minister in accordance with section 17, or the liquids referred to in subsection 15(2) shall prepare a report that is current to December 31 of each calendar year in which the person owns the equipment or the liquids and that contains the following information:

**33.** (1) Le propriétaire des pièces d'équipement visées à l'alinéa 16(1)a) ou au sous-alinéa 16(1)b)(i), autres que celles pour lesquelles une prolongation a été accordée par le ministre en vertu de l'article 17, ou des liquides visés au paragraphe 15(2) est tenu de préparer un rapport, au 31 décembre de chaque année civile durant laquelle il en est propriétaire, comportant les renseignements suivants :

Date de fin d'utilisation des pièces d'équipement et des liquides — 2009

(a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the owner and any person authorized to act on the owner's behalf;

a) ses nom, adresses municipale et postale, numéro de téléphone et, le cas échéant, numéro de télécopieur et adresse électronique, ainsi que ceux de toute personne autorisée à agir en son nom;

(b) the civic addresses of the facilities where the equipment and liquids are located or, if there is no civic address, their location using the owner's site identification system;

b) l'adresse municipale des installations où se trouvent les pièces d'équipement et les liquides ou, à défaut, l'endroit où ils se trouvent d'après le système d'identification de site du propriétaire;

(c) the quantity of the liquids containing PCBs in the equipment and of the liquids, expressed in litres,

- (i) that are in use on December 31,
- (ii) that are stored on December 31 at the person's PCB storage site,
- (iii) that are sent, in that calendar year, to an authorized facility that is a transfer site,
- (iv) that are sent, in that calendar year, to an authorized facility that is authorized to destroy them, or
- (v) that are destroyed in that calendar year; and

(d) a certification that the information is accurate and complete and that is dated and signed by the owner or by a person authorized to act on the owner's behalf.

Equipment and liquids for which extension granted

(2) The owner of the equipment referred to in paragraph 16(1)(a) and subparagraph 16(1)(b)(i) or the liquids referred to in subsection 15(2) for which an extension is granted by the Minister in accordance with section 17 shall prepare a report that is current to December 31 of each calendar year in which the person owns the equipment or the liquids and that contains the following information for each piece of equipment or container of liquid:

- (a) the information required under paragraphs (1)(a) and (d);
- (b) the unique identification number that is on the label referred to in paragraph 29(4)(c);
- (c) the civic address, function and technical description of the facility where the equipment or container of liquid is located or, if there is no civic address, its location using the owner's site identification system;
- (d) the progress on the plan's implementation and the timelines for ending the use of the equipment;
- (e) the measures taken to minimize or eliminate any harmful effect of the PCBs in the equipment on the environment and on human health; and
- (f) the findings of the inspections of the equipment.

End of use of equipment — 2025

(3) The owner of the equipment referred to in subparagraph 16(1)(b)(ii) and subsection 16(2) shall prepare a report that is current to December 31 of each calendar year in which the person owns the equipment and that contains the following information:

- (a) the information required under paragraphs (1)(a), (b) and (d); and
- (b) the quantity, expressed in litres, of liquids containing PCBs in the equipment, and the concentration, expressed in mg/kg, of the PCBs
  - (i) that are stored on December 31 at the person's PCB storage site,

c) la quantité, exprimée en litres, de liquides qui contiennent des BPC dans les pièces d'équipement et de liquides :

- (i) en usage le 31 décembre,
- (ii) stockés à son dépôt le 31 décembre,
- (iii) expédiés, au cours de l'année civile, à une installation agréée qui est un centre de transfert,
- (iv) expédiés, au cours de l'année civile, à une installation agréée qui est autorisée à les détruire,
- (v) détruits au cours de l'année civile;

d) une attestation, datée et signée par lui ou par toute personne autorisée à agir en son nom, portant que les renseignements sont complets et exacts.

(2) Le propriétaire des pièces d'équipement visées à l'alinéa 16(1)a) ou au sous-alinéa 16(1)b)(i) ou des liquides visés au paragraphe 15(2) pour lesquels une prolongation a été accordée par le ministre en vertu de l'article 17 est tenu de préparer un rapport, au 31 décembre de chaque année civile durant laquelle il en est propriétaire, comportant les renseignements suivants pour chaque pièce d'équipement et contenant de liquides :

- a) les renseignements prévus aux alinéas (1)a) et d);
- b) le numéro d'identification unique figurant sur l'étiquette conformément à l'alinéa 29(4)c);
- c) l'adresse municipale, la fonction et les caractéristiques techniques de l'installation où se trouvent la pièce d'équipement ou le contenant des liquides ou, à défaut, l'endroit où il se trouvent d'après le système d'identification de site du propriétaire;
- d) le progrès accompli dans la mise en œuvre du plan et de l'échéancier dressé en vue de la cessation de l'utilisation de la pièce d'équipement;
- e) les mesures prises pour éliminer ou atténuer tout effet nocif des BPC contenus dans la pièce d'équipement sur l'environnement et la santé humaine;
- f) les résultats des inspections de la pièce d'équipement.

Pièces d'équipement et liquides pour lesquels une prolongation a été accordée

(3) Le propriétaire des pièces d'équipement visées au sous-alinéa 16(1)b)(ii) ou au paragraphe 16(2) est tenu de préparer un rapport, au 31 décembre de chaque année civile durant laquelle il en est propriétaire, comportant les renseignements suivants :

- a) les renseignements prévus aux alinéas (1)a), b) et d);
- b) la quantité de liquides qui contiennent des BPC dans les pièces d'équipement, exprimée en litres, et la concentration de ces BPC dans les liquides, exprimée en mg/kg :
  - (i) stockés à son dépôt de BPC le 31 décembre,

Date de fin d'utilisation des pièces d'équipement — 2025

- (ii) that are sent, in that calendar year, to an authorized facility that is a transfer site,
- (iii) that are sent, in that calendar year, to an authorized facility that is authorized to destroy them, or
- (iv) that are destroyed in that calendar year.

Research

**34.** The person who offers for sale, sells, processes or uses PCBs or products containing PCBs for the purpose of research in accordance with section 8 shall prepare a report that is current to December 31 in each calendar year in which the person offers for sale, sells, processes or uses those PCBs or products and that contains the following information:

- (a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the person and of any person authorized to act on that person's behalf;
- (b) an indication of whether the person offers for sale, sells, processes or uses the PCBs or products;
- (c) the quantity of the PCBs or of the products containing PCBs that are offered for sale, sold, processed or used in that calendar year; and
- (d) a certification that the information is accurate and complete and that is dated and signed by the person or by a person authorized to act on their behalf.

Colouring pigment

**35.** The person who manufactures, exports or imports colouring pigment in accordance with section 11 shall prepare a report that is current to December 31 in each calendar year in which the person manufactures, imports or exports the colouring pigment and that contains the following information:

- (a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the person and of any person authorized to act on that person's behalf;
- (b) an indication of whether the person manufactures, exports or imports colouring pigment;
- (c) the quantity of colouring pigment, expressed in kilograms, the maximum concentration of PCBs in the colouring pigment, expressed in mg/kg, and the average annual concentration of PCBs in the colouring pigment, expressed in mg/kg, that is manufactured, imported or exported in that calendar year;
- (d) in the case of importing, the name, telephone number and civic and mailing addresses of the person from whom the colouring pigment is imported and, in the case of exporting, the name, telephone number and civic and mailing addresses of the person to whom the colouring pigment is exported; and
- (e) a certification that the information is accurate and complete and that is dated and signed by the person or by a person authorized to act on their behalf.

- (ii) expédiés, au cours de l'année civile, à une installation agréée qui est un centre de transfert,
- (iii) expédiés, au cours de l'année civile, à une installation agréée qui est autorisée à les détruire,
- (iv) détruits au cours de l'année civile.

Recherches

**34.** La personne qui met en vente, vend, transforme ou utilise des BPC ou des produits qui en contiennent en vue d'effectuer des recherches conformément à l'article 8 est tenue de préparer un rapport, au 31 décembre de chaque année civile durant laquelle elle les a mis en vente, vendus, utilisés ou transformés, comportant les renseignements suivants :

- a) ses nom, adresses municipale et postale, numéro de téléphone et, le cas échéant, numéro de télécopieur et adresse électronique, ainsi que ceux de toute personne autorisée à agir en son nom;
- b) une mention indiquant si elle les a mis en vente, vendus, transformés ou utilisés;
- c) la quantité de BPC ou de produits qui ont été mis en vente, vendus, transformés ou utilisés durant l'année civile;
- d) une attestation, datée et signée par elle ou par toute personne autorisée à agir en son nom, portant que les renseignements sont complets et exacts.

Pigments pour la coloration

**35.** La personne qui fabrique, exporte ou importe, conformément à l'article 11, des pigments pour la coloration est tenue de préparer un rapport, au 31 décembre de chaque année civile durant laquelle elle les fabrique, exporte ou importe, comportant les renseignements suivants :

- a) ses nom, adresses municipale et postale, numéro de téléphone et, le cas échéant, numéro de télécopieur et adresse électronique, ainsi que ceux de toute personne autorisée à agir en son nom;
- b) une mention indiquant si elle les a fabriqués, exportés ou importés;
- c) la quantité, exprimée en kilogrammes, de pigments qui ont été fabriqués, exportés ou importés durant l'année civile ainsi que la concentration moyenne annuelle et la concentration maximale en BPC de ces pigments, exprimée en mg/kg;
- d) les nom, adresses municipale et postal et numéro de téléphone de la personne de qui proviennent les pigments, dans le cas où ils sont importés, ou à qui ils sont expédiés, dans le cas où ils sont exportés;
- e) une attestation, datée et signée par elle ou par toute personne autorisée à agir en son nom, portant que les renseignements sont complets et exacts.

Solid products containing PCBs

**36.** The person who manufactures solid products containing PCBs in accordance with section 13 shall prepare a report that is current to December 31 in each calendar year in which the person manufactures the products and that contains the following information:

- (a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the person and of any person authorized to act on that person's behalf;
- (b) the quantity of solid products manufactured in that calendar year, expressed in kilograms, and the maximum concentration and average concentration of PCBs in the solid products, expressed in mg/kg, for that calendar year;
- (c) the name, telephone number and civic and mailing addresses of the person to whom the manufacturer sells the products; and
- (d) a certification that the information is accurate and complete and that is dated and signed by the person or by a person authorized to act on their behalf.

Stored PCBs or products — PCB concentration of 50 mg/kg or more

**37.** The person who owns and stores PCBs or products containing PCBs in a concentration of 50 mg/kg or more, other than the equipment and liquids referred to in section 33, shall prepare a report that is current to December 31 in each calendar year in which the person stores the PCBs or products at their PCB storage site and that contains the following information:

- (a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the owner and of any person authorized to act on the owner's behalf;
- (b) the civic addresses of the PCB storage sites where the PCBs or products are located, or if there is no civic address, their location using the owner's site identification system;
- (c) the quantity of liquids containing PCBs in the products, expressed in litres, and the quantity of solids containing PCBs in the products, expressed in kilograms, and the concentration of PCBs in the liquids and the solids, expressed in mg/kg
  - (i) that are stored on December 31 at the person's PCB storage site,
  - (ii) that are sent, in that calendar year, to an authorized facility that is a transfer site,
  - (iii) that are sent, in that calendar year, to an authorized facility that is authorized to destroy them, or
  - (iv) that are destroyed in that calendar year; and
- (d) a certification that the information is accurate and complete and that is dated and signed by the owner of the PCBs or products containing PCBs or by a person authorized to act on the owner's behalf.

**36.** La personne qui fabrique, conformément à l'article 13, des produits solides qui contiennent des BPC est tenue de préparer un rapport, au 31 décembre de chaque année civile durant laquelle elle les fabrique, comportant les renseignements suivants :

- a) ses nom, adresses municipale et postale, numéro de téléphone et, le cas échéant, numéro de télécopieur et adresse électronique, ainsi que ceux de toute personne autorisée à agir en son nom;
- b) la quantité, exprimée en kilogrammes, de produits qui ont été fabriqués durant l'année civile ainsi que la concentration moyenne et la concentration maximale en BPC de ces produits, exprimée en mg/kg, pour cette année civile;
- c) les nom, adresse municipale et postale et numéro de téléphone de la personne à qui elle a vendu les produits;
- d) une attestation, datée et signée par elle ou par toute personne autorisée à agir en son nom, portant que les renseignements sont complets et exacts.

Produits solides qui contiennent des BPC

**37.** Le propriétaire de BPC ou de produits qui en contiennent en une concentration égale ou supérieure à 50 mg/kg, autres que les pièces d'équipement ou les liquides visés à l'article 33, qui les stocke à son dépôt de BPC est tenu de préparer un rapport, au 31 décembre de chaque année civile durant laquelle il les stocke ainsi, comportant les renseignements suivants :

- a) ses nom, adresses municipale et postale, numéro de téléphone et, le cas échéant, numéro de télécopieur et adresse électronique, ainsi que ceux de toute personne autorisée à agir en son nom;
- b) l'adresse municipale des dépôts où sont stockés les BPC et les produits ou, à défaut, l'endroit où ils se trouvent d'après le système d'identification de site du propriétaire;
- c) la quantité de liquides qui contiennent des BPC dans les produits, exprimée en litres, la quantité de solides qui contiennent des BPC dans les produits, exprimée en kilogrammes, et la concentration de BPC dans les liquides ou les solides, exprimée en mg/kg :
  - (i) stockés à son dépôt de BPC le 31 décembre,
  - (ii) expédiés, au cours de l'année civile, à une installation agréée qui est un centre de transfert,
  - (iii) expédiés, au cours de l'année civile, à une installation agréée qui est autorisée à les détruire,
  - (iv) détruits au cours de l'année civile,
- d) une attestation, datée et signée par lui ou par toute personne autorisée à agir en son nom, portant que les renseignements sont complets et exacts.

BPC ou produits stockés — concentration de BPC de 50 mg/kg ou plus

Stored PCBs or products — transfer site or destruction facility

**38.** The owner of an authorized facility that is a transfer site or that is authorized to destroy PCBs or products containing PCBs and who stores them at their PCB storage site, other than the owner referred to in section 37, shall prepare a report that is current to December 31 in each calendar year and that contains the following information:

- (a) the name, civic and mailing addresses, telephone number, fax number, if any, and e-mail address, if any, of the owner and of any person authorized to act on the owner's behalf;
- (b) the civic addresses of the sites where the PCBs or products containing PCBs are stored, or if there is no civic address, the location of the sites using the owner's site identification system;
- (c) the quantity of liquids containing PCBs in the products, expressed in litres, or the quantity of solids containing PCBs in the products, expressed in kilograms, and the concentration of the PCBs in the liquids and the solids, expressed in mg/kg
  - (i) that are stored on December 31 at the owner's PCB storage site,
  - (ii) that are sent, in that calendar year, to an authorized facility that is a transfer site,
  - (iii) that are sent, in that calendar year, to an authorized facility that is authorized to destroy them, or
  - (iv) that are destroyed in that calendar year; and
- (d) a certification that the information is accurate and complete and that is dated and signed by the owner of the authorized facility or by a person authorized to act on the owner's behalf.

Date of submission of report

**39.** (1) The person who is required to prepare a report in accordance with subsection 33(1) or (2) and with any of sections 34 to 38 shall submit it to the Minister on or before March 31 of the year following the calendar year for which the report is made.

Report made under subsection 33(3)

- (2) The person who is required to prepare a report in accordance with subsection 33(3) shall submit it to the Minister
  - (a) on or before March 31, 2010 for reports that are current to December 31 of the year that these Regulations come into force up to the year 2009;
  - (b) on or before March 31, 2014 for reports that are current to December 31 of each of the years 2010 to 2013;
  - (c) on or before March 31, 2018 for reports that are current to December 31 of each of the years 2014 to 2017;
  - (d) on or before March 31, 2022 for reports that are current to December 31 of each of the years 2018 to 2021;
  - (e) on or before March 31, 2026 for reports that are current to December 31 of each of the years 2022 to 2025;

**38.** Le propriétaire d'une installation agréée qui est un centre de transfert ou qui est autorisée à détruire des BPC et des produits qui en contiennent, autre que le propriétaire visé à l'article 37, et qui les stocke à son dépôt de BPC est tenu de préparer un rapport, au 31 décembre de chaque année civile durant laquelle il les transforme ou les détruit, comportant les renseignements suivants :

- a) ses nom, adresses municipale et postale, numéro de téléphone et, le cas échéant, numéro de télécopieur et adresse électronique, ainsi que ceux de toute personne autorisée à agir en son nom;
- b) l'adresse municipale des dépôts où sont stockés les BPC et les produits ou, à défaut, l'endroit où ils se trouvent d'après le système d'identification de site du propriétaire;
- c) la quantité de liquides qui contiennent des BPC dans les produits, exprimée en litres, la quantité de solides qui contiennent des BPC dans les produits, exprimée en kilogrammes, et la concentration de BPC dans les liquides ou les solides, exprimée en mg/kg :
  - (i) stockés à son dépôt de BPC le 31 décembre,
  - (ii) expédiés, au cours de l'année civile, à une installation agréée qui est un centre de transfert,
  - (iii) expédiés, au cours de l'année civile, à une installation agréée qui est autorisée à les détruire,
  - (iv) détruits au cours de l'année civile,
- d) une attestation, datée et signée par lui ou par toute personne autorisée à agir en son nom, portant que les renseignements sont complets et exacts.

BPC ou produits stockés — Centre de transfert ou de destruction

Date de présentation des rapports

**39.** (1) La personne qui est tenue de préparer tout rapport visé aux paragraphes 33(1) ou (2) ou à l'un des articles 34 à 38 le présente au ministre au plus tard le 31 mars de l'année civile qui suit celle pour laquelle il est établi.

- (2) Celle qui est tenue de préparer le rapport visé au paragraphe 33(3) le présente au ministre :
  - a) au plus tard le 31 mars 2010, s'il porte sur toute année civile suivant l'entrée en vigueur du présent règlement jusqu'à l'année 2009;
  - b) au plus tard le 31 mars 2014, s'il porte sur l'une ou l'autre des années 2010 à 2013;
  - c) au plus tard le 31 mars 2018, s'il porte l'une ou l'autre des années 2014 à 2017;
  - d) au plus tard le 31 mars 2022, s'il porte sur l'une ou l'autre des années 2018 à 2021;
  - e) au plus tard le 31 mars 2026, s'il porte sur l'une ou l'autre des années 2022 à 2025;
  - f) au plus tard le 31 mars 2027, s'il porte sur l'année 2026;
  - g) au plus tard le 31 mars 2030, s'il porte sur l'une ou l'autre des années 2027 à 2029.

Rapport visé au paragraphe 33(3)

(f) on or before March 31, 2027 for reports that are current to December 31 of the year 2026; and  
 (g) on or before March 31, 2030 for reports that are current to December 31 of each of the years 2027 to 2029.

Release into the environment

**40.** (1) For the purposes of paragraph 95(1)(a) of the Act, where there occurs or is a likelihood of a release into the environment of PCBs in contravention of section 5, the person who is designated to be provided with a written report is the Manager of Inspection Program, Environmental Enforcement Division, Enforcement Branch of the Department of the Environment in the region where the release occurs or is likely to occur.

**40.** (1) Pour l'application de l'alinéa 95(1)(a) de la Loi, en cas de rejet dans l'environnement — effectif ou probable — de BPC en violation de l'article 5, la personne désignée pour recevoir le rapport écrit est le Gestionnaire du programme d'inspection, Direction de l'application de la loi en environnement, Direction générale de l'application de la loi du ministère de l'Environnement, dans la région où a lieu le rejet — effectif ou probable.

Rejets dans l'environnement

Contents

(2) The report shall include the following information:

- (a) the name, civic and mailing addresses and telephone number of the person who owns or has the charge, management or control of the PCBs that are released into the environment;
- (b) the date, time and location of the release;
- (c) a description of the source of the release; and
- (d) the quantity of liquids containing PCBs released, expressed in litres, the quantity of solids containing PCBs released, expressed in kilograms, and the concentration of PCBs in the liquids and the solids that are released, expressed in mg/kg.

(2) Le rapport comporte les renseignements suivants :

- a) les nom, adresses municipale et postale et numéro de téléphone de la personne qui a toute autorité sur les BPC qui ont été rejetés dans l'environnement ou qui en est propriétaire;
- b) les date, heure et lieu du rejet;
- c) une description de la source du rejet;
- d) la quantité de liquides qui contiennent des BPC rejetés, exprimée en litres, la quantité de solides qui contiennent des BPC rejetés, exprimée en kilogrammes, et la concentration de BPC dans les liquides ou les solides rejetés, exprimée en mg/kg.

Contenu

Retention

**41.** Any person who is required to submit a report under these Regulations shall keep a copy of the report at their principal place of business in Canada for at least five years after the day on which the report is submitted.

**41.** Toute personne qui est tenue de présenter un rapport en application du présent règlement en conserve une copie à son établissement principal au Canada pendant au moins cinq ans après la date de sa présentation.

Conservation

Method of submission

**42.** Each report referred to in sections 33 to 38 shall be submitted electronically in the format provided by the Department of the Environment, but the report shall be submitted in writing if

- (a) no such format is provided; or
- (b) it is, owing to circumstances beyond the control of the person required to submit the report, impracticable to submit the report electronically in the format provided.

**42.** Les rapports visés aux articles 33 à 38 sont présentés sous forme électronique selon le modèle établi par le ministère de l'Environnement. Ils sont toutefois présentés par écrit dans les cas suivants :

- a) aucun modèle n'a été établi par le ministère;
- b) il est pratiquement impossible, pour des raisons indépendantes de la volonté de la personne tenue de les présenter, de le faire sous forme électronique selon le modèle établi.

Méthode de présentation

**RECORDS**

**DOCUMENTS ET REGISTRES**

Records for permitted activities

**43.** The following persons shall maintain records that demonstrate that they manufacture, process, use, sell, offer for sale, store, import or export PCBs or products containing PCBs in accordance with the Act and these Regulations:

- (a) the owner of PCBs or products containing PCBs;
- (b) the person who is engaged in any of these activities; and
- (c) the owner or operator of a PCB storage site.

**43.** Les personnes ci-après conservent les documents établissant que des BPC ou des produits qui en contiennent ont été fabriqués, transformés, utilisés, mis en vente, vendus, stockés, importés ou exportés conformément à la Loi et au présent règlement :

- a) le propriétaire des BPC ou des produits;
- b) la personne qui exerce l'activité;
- c) le propriétaire ou l'exploitant du dépôt de BPC.

Documents concernant les activités permises

Inspection record

**44.** (1) The owner or operator of a PCB storage site shall maintain a record of all inspections conducted at the PCB storage site under paragraph 27(a)

- (a) listing all items that are inspected;
- (b) describing any deficiency found;

**44.** (1) Le propriétaire ou l'exploitant d'un dépôt de BPC tient un registre de toutes les inspections effectuées au dépôt de BPC en application de l'alinéa 27a), lequel fait état :

- a) de tous les points inspectés;

Registres d'inspections

	(c) setting out the measures taken to remedy the deficiency; and (d) specifying the dates of the inspections and the names of the inspectors.	b) de toutes les lacunes relevées; c) des mesures à prendre pour y remédier; d) de la date de l'inspection et du nom de l'inspecteur.	
Owner of equipment — extension	(2) The owner of equipment for which an extension of the end-of-use date is applied under section 17 shall maintain a record of all inspections conducted on the equipment that contains the information set out in paragraphs (1)(a) to (d).	(2) Le propriétaire d'une pièce d'équipement dont l'utilisation fait l'objet d'une prolongation en vertu de l'article 17 tient un registre de toutes les inspections de la pièce d'équipement qui ont été effectuées, lequel fait état des renseignements prévus aux alinéas (1)a) à d).	Propriétaire d'une pièce d'équipement — prolongation
Retention of records	<b>45.</b> The person who is required to maintain a record under sections 43 and 44 shall retain it at their principal place of business in Canada or at the place where they conduct the activity for at least five years (a) after the destruction of the PCBs or the products containing PCBs that are the subject of the record, in the case of the owner of PCBs or products containing PCBs or the owner or operator of the PCB storage site where the PCBs or products containing PCBs are stored; or (b) after the completion of an activity referred to in section 43, in the case of the person who is engaged in that activity.	<b>45.</b> Toute personne qui est tenue de conserver des documents ou de tenir un registre en application des articles 43 et 44 respectivement les conserve à son établissement principal au Canada ou à l'établissement où l'activité est exercée pendant au moins cinq ans après : a) dans le cas du propriétaire de BPC ou de produits qui en contiennent ou du propriétaire ou de l'exploitant d'un dépôt de BPC où sont stockés des BPC ou des produits qui en contiennent, la date de destruction des BPC ou des produits qui en contiennent visés par le document ou le registre; b) dans le cas de la personne qui exerce une activité visée à l'article 43, la date de la fin de l'activité.	Conservation des dossiers
<b>PART 5</b>		<b>PARTIE 5</b>	
<b>REPEALS AND COMING INTO FORCE</b>		<b>ABROGATIONS ET ENTRÉE EN VIGUEUR</b>	
<b>REPEALS</b>		<b>ABROGATION</b>	
Repeal	<b>46. The <i>Chlorobiphenyls Regulations</i><sup>1</sup> are repealed.</b>	<b>46. Le <i>Règlement sur les biphényles chlorés</i><sup>1</sup> est abrogé.</b>	Abrogation
Repeal	<b>47. The <i>Storage of PCB Material Regulations</i><sup>2</sup> are repealed.</b>	<b>47. Le <i>Règlement sur le stockage des matériels contenant des BPC</i><sup>2</sup> est abrogé.</b>	Abrogation
<b>COMING INTO FORCE</b>		<b><i>Entrée en vigueur</i></b>	
Coming into force	<b>48. These Regulations come into force on the day on which they are registered.</b>	<b>48. Le présent règlement entre en vigueur à la date de son enregistrement.</b>	Entrée en vigueur

<sup>1</sup> SOR/91-152

<sup>2</sup> SOR/92-507; SOR/2000-102, s. 15

<sup>1</sup> DORS/91-152

<sup>2</sup> DORS/92-507; DORS/2000-102, a. 15

# Appendix **E**

**Solid Waste By-law 341 and By-law 544**

BY-LAW 341 - SOLID WASTE BY-LAW

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THE CORPORATION OF THE TOWN OF IQALUIT, N.W.T.

BY-LAW 341

BEING A BY-LAW of the incorporated Town of Iqaluit in the Northwest Territories to provide for the regulation, collection and disposal of solid waste.

WHEREAS the Cities, Towns and Villages Act, R.S.N.W.T., 1988, c.C-8, Sections 85 through 88, 169, 173 and 182 through 187 provides that Municipalities may; regulate, establish and operate garbage facilities, provide for the collection, removal and disposal of garbage, provide for sale or reuse of any waste by-product, levi and collect fees for garbage services and impose punishment for offenses.

NOW, THEREFORE PURSUANT to the provisions of the Cities, Towns and Villages Act, and notwithstanding any by-laws, sections thereof, resolutions or prior enactments,

THE COUNCIL OF THE TOWN OF IQALUIT, in regular session duly assembled, enacts as follows:

PART I, INTERPRETATION

101. Short Title

This by-law may be cited as the Solid Waste By-Law.

102. Severability

If any provision of this by-law is declared invalid because of any word, phrase, clause, sentence, paragraph or section of this By-Law or any documents which form part of this By-Law or an application thereof to any person or circumstance is declared invalid, the remaining provisions shall not be affected thereby but shall remain in force.

103. Definitions

In this by-law, unless the content otherwise requires;

"at cost"

means the posted equipment and manpower rates of the Town, as adjusted from time to time, and any administrative overhead costs plus 15%.

"authorized contractor" means a contractor, authorized by By-Law, to perform solid waste services, on behalf of the Town of Iqaluit in accordance with specified terms, conditions and fees.

"bulky waste" means waste which will not normally fit into a garbage box.

"combustible waste" means waste suitable for burning that can be readily burned without appreciably endangering operations or the environment.

"commercial" means a single premise used for the purpose of carrying on a business for profit and represented by the owner(s) and/or tenant(s).

"commercial/government/industrial hazardous waste" means solid waste generated by commercial, government or industrial organizations which could be flammable, toxic, corrosive, explosive, or otherwise has the potential for endangering municipal operations, the community or the surrounding environment.

"construction debris" means unwanted, useless, abandoned, discarded or rejected goods or materials of every kind that are normally generated on a construction site but, excluding sewage and/or commercial, government and industrial hazardous waste.

"Council" means the Council of the Town of Iqaluit.

"covered" means secured in such a fashion that wind, animals or birds cannot scatter.

"covered conveyance" means a vehicle used to transport solid waste to the waste facility where the waste is contained so that it cannot fall out, be blown out or otherwise scattered.

"garbage" means the same as "solid waste".

"garbage room/building"	means a locked room or building, as per any specifications relating to this by-law, used exclusively for the temporary holding of garbage in readiness for scheduled collection.
"government"	means a single premise used for the purpose of government and represented by senior official(s) and/or elected representative(s).
"honey bag"	means bagged raw sewage.
"household hazardous waste"	means solid wastes generated only in residential domiciles which are flammable, toxic, corrosive, explosive, or otherwise has the potential for endangering municipal operations, the community or the environment.
"household waste"	means solid waste normally generated in or from residential domiciles but, excluding hazardous waste.
"industrial"	means a single premise used for manufacturing and represented by the owner(s) and/or tenant(s).
"land fill"	means a duly licensed site used for the disposal of municipal type solid waste.
"littering"	means disposing of garbage in any area other than prescribed by this by-law.
"Manager"	means the Senior Administrative Officer of the Town of Iqaluit or their designate.
"municipal type solid waste"	means garbage which can be hand placed in garbage truck but, does not include sewage or hazardous waste.
"residential"	means a single domicile represented by the owner(s) or tenant(s). This also includes "not for profit" premises.

"segregate"	means the separation of solid waste into combustible, salvageable, recyclable, bulky, metal or hazardous waste.
"solid waste"	means unwanted, useless, abandoned, discarded or rejected goods or materials of every kind but, excluding sewage and/or commercial, government and industrial hazardous waste.
"solid waste facility"	refers to the Town operated modified sanitary land fill, which is clearly marked with signs, which is located in the West 40 between an old abandoned waste site and fuel tank #22. The site is referred to as site #3 in the Town Waste Management Plan.
"Town"	means the Town of Iqaluit or its duly authorized contractor(s).
"waste container"	means a covered garbage box, locked garbage room or house and dumpsters as specified in any specifications relating to this by-law.
"waste generator"	means one who produces waste of any nature which relates to and is under the control of this by-law.

## PART II, GENERAL PROVISIONS

### 201. Authority to Provide Municipal Services

No person or contractor, except those authorized by By-Law, shall directly or indirectly engage in the provision of municipal solid waste services within the Town.

### 202. Authority and Duties of the Manager

- (1) The Manager is authorized and directed to;
  - (a) supervise, control and administer the provisions and regulations and to do all things necessary to fulfil their responsibilities and duties under this by-law;

- (b) control all contracting, construction, operation, maintenance and regulatory compliance related to the provision of solid waste services;
  - (c) perform all acts that may be necessary for the efficient management, operation and protection of the municipality;
  - (d) enter upon private property for the purpose of this by-law; and
  - (e) levy tariffs, fines and penalties as well as take any other legal actions necessary to enforce this by-law.
- (2) The Manager may prescribe;
- (a) orders,
  - (b) specifications for
    - (i) waste containers
    - (ii) segregation of waste
    - (iii) and other specifications,
  - (c) waste collection days, and
  - (d) hours of operation and service.
- (3) The Manager may prescribe forms for;
- (a) application for service,
  - (b) termination of service,
  - (c) receipt of service,
  - (d) charges for service,
  - (e) description, volume and type of waste,
  - (f) violations,
  - (g) any other forms and information sheets necessary to carry out the provisions of this by-law.

### 203. Financing and Accounting

- (1) All costs for the provision of solid waste services shall be financed through tariffs, service charges, fees, (as per Schedule "C") loans, and grants, subsidies or other funding provided to the Town by the Government of the Northwest Territories and/or others.

- (2) All monies collected for solid waste services shall only be used to provide waste services to customers including administration, operation, maintenance, training, extension, repair, capital improvements and regulatory compliance.
- (3) All monies collected for the provision of solid waste services shall be separately accounted for and disbursed by action of the Council.
- (4) Bills for tariffs, service charges, fees and all other penalties and/or charges levied under this by-law are due and payable not later than thirty (30) days after the date of mailing.
- (5) Overdue accounts shall have interest charged at the same rates that are charged for overdue taxes as established by the prevailing Town Taxation By-Law.

#### 204. Service Area

- (1) The Town shall provide municipal type solid waste collection services to premises within the built up areas of the Town.
- (2) Collection of municipal type solid waste outside the service area will only be provided at cost and when such services will not impede the provision of this service within the designated service area.

#### 205. Description of Service

- (1) The Town shall collect municipal type solid waste, within the service area, from residences, commercial establishments, industrial establishments and government locations on a scheduled basis.
- (2) The Town shall operate and maintain a solid waste facility, known as the Town Land Fill, for municipal type waste, household hazardous waste and bulky waste, which is located at site 3 in the West 40. All solid waste, with the exception of raw sewage and/or commercial, government and industrial generated hazardous waste, shall be disposed of at the Town Land Fill.
- (3) Notwithstanding subsections (1) and (2), when in the opinion of the manager, or regulatory agencies, the environment or public health and safety are seriously impaired, the manager may;
  - (a) restrict or terminate municipal type solid waste collection,

- (b) restrict or terminate operation of the solid waste facility.
- (4) The Town shall make every reasonable effort to provide safe, continuous and efficient solid waste services; nevertheless, the Town shall not be liable for damages, including business losses,
- (a) caused by restriction or termination of municipal type solid waste collection,
  - (b) caused by restriction or termination of operation of the solid waste facility,
  - (c) caused through noncompliance with specifications,
  - (d) caused by impeded access to waste containers,
  - (e) caused by the interference or cessation of solid waste services in connection with the repair, expansion, replacement, or proper operation and maintenance of the solid waste collection system or solid waste disposal facility,
  - (f) caused by the interference or cessation of service due to adverse weather conditions, road conditions or vehicle mechanical problems,
  - (g) caused by improper segregation of waste,
  - (h) generally for any accident due to the operation of the municipal system, unless such action has been shown to be directly due to the negligence of the Town or its employees,
  - (i) caused by the interference or cessation of service due to any contravention of this by-law.
- (5) The Town shall conduct a mass participation annual spring clean-up of litter and unsightly bulky waste.
- (6) The Town shall conduct a household hazardous waste round up four (4) times per year.
- (7) The Town shall not collect, transport, handle, store nor dispose of commercial, government or industrial generated hazardous waste.
- (8) Collection, transportation, handling, storage and disposal of commercial, government or industrial generated hazardous waste is the sole responsibility of the generator and must be done in accordance with all applicable legislation.

- (9) Stockpiling of any commercial, government or industrial generated hazardous waste must not be left to accumulate, within Town boundaries, for over four (4) years.
- (10) No-one shall indiscriminately dispose of hazardous waste.
- (11) The Town shall not collect, handle nor dispose of honey bags.
- (12) Anyone who litters must clean up their litter immediately upon notification by the manager and/or be liable to a fine as specified in schedule "A".
- (13) Should a building or structure have been damaged by fire or other means, the owner must, within one hundred and twenty (120) days, apply to the Town for the necessary permits to restore, repair, or demolish the structure or the building may be deemed to be construction debris under the terms of this by-law.

#### 206. Authority to Restrict Service

- (1) The Manager may, without notice, cease or restrict service to any customer or part of Town should he decide that an emergency makes such action necessary.
- (2) The Manager may, in a non-emergency situation, including adverse weather conditions, scheduled repairs, or alteration of the collection or disposal system, restrict service to any customer or part of the Town, provided that the Manager shall, when it is practical to do so, provide public notice of such intended cessation or restriction of service to all affected customers.
- (3) The Manager may discontinue service for any of the following reasons;
  - (a) failure to establish service,
  - (b) fraud in establishing service,
  - (c) non-payment of charges or fees levied pursuant to this by-law,
  - (d) failure to provide a deposit, if required,
  - (e) failure to provide unimpeded access; or
  - (f) contravention of any other section of this by-law.
- (4) When service is discontinued, neither the Town nor its employees or any municipal officials shall be liable for any costs or damages resulting from the discontinuance of service.

- (5) Where this by-law authorises service to be discontinued, the Manager shall, when it is practical to do so, give notice prior to service being discontinued. Such notice shall indicate the infraction, remedy, and the date that service will be discontinued unless remedy is made. When service is discontinued, service shall not be reinstated until such time as there is no longer a contravention of this by-law or any outstanding service charges and fees, and a specified reinstatement service fee is paid to the Town.

#### 207. Notification

- (1) Notice from the Town to a customer or owner for bills due, contravention of any provisions of this by-law, or for any other reasons, shall be in writing to the last known address.
- (2) Notice to the Town shall be made in writing to the Municipal Office, except that notice of complaint may be made by telephone or in person.

#### 208. Effective Date

- (1) This by-law shall come into effect April 1, 1995 and shall remain in effect until it is repealed.

### PART III, ESTABLISHMENT AND TERMINATION OF SERVICE

#### 301. To Establish Waste Collection Service

- (1) Subject to subsection (2), every person requiring establishment of service, shall submit to the Manager an application for service form and the appropriate fees specified in Schedule C.
- (2) Where premises are occupied by a tenant or lessee, the Manager may require that the application for service be submitted by the owner of the premises.
- (3) Where a premise has multiple occupancies the application for service shall be submitted, along with detailed drawings and specifications for waste containment, by the owner of the premise.
- (4) An application for service must allow a minimum of five (5) working days prior to date when service is expected.

- (5) An application for service will not be required for units which were already obtaining service at the effective date of this by-law.

### 302. Content of Application for Waste Collection Service

The application for service shall include such particulars as the following;

- (a) location of the premise,
- (b) date applicant will be ready for service,
- (c) type of waste storage erected or intended for erection,
- (d) whether the premise had been previously serviced,
- (e) name and mailing address to which notices and bills are to be sent,
- (f) whether the applicant is owner or tenant of, or agent for the premises,
- (g) category of customer and applicable rate,
- (h) agreement to abide by and accept all the provisions of this by-law,
- (i) any other fees or service charges,
- (j) detailed drawings and specifications for garbage rooms or buildings, and
- (h) any other information in such detail and form the Manager deems appropriate.

### 303. Deposit

As a condition of providing services the Manager may require a deposit from the applicant provided that;

- (a) the amount of the deposit shall be determined by the Manager based on the expected service charge for a ninety (90) day period,
- (b) the deposit shall be refunded after it has been held for a twelve consecutive month period during which all bills for service have been paid within the time allowed,

- (c) the deposit, less the amount of any unpaid balance due to the Town, shall be refunded upon discontinuance of service, and
- (d) interest of six (6) percent per year will be paid on any deposit.

#### 304. Application to Terminate Service

- (1) In order to terminate service, the customer shall submit to the Manager a written request stating the date the applicant desires to terminate service and any other information and in such form as may be prescribed by the Manager.
- (2) All applications for termination of service must allow a minimum of five (5) working days prior to the date termination of service is required.
- (3) The Town may continue to levy service charges in accordance with this by-law until services are terminated.

### PART IV, RESPONSIBILITIES OF THE WASTE GENERATOR

#### 401. Residential Waste

- (1) Every residential generator of municipal type waste shall maintain, in good condition, sufficient covered or enclosed waste containers as per Town specifications.
- (2) All waste placed in a waste container must first be placed in a garbage bag.
- (3) All waste containers shall be kept within the property boundaries of the lot or parcel of land on which the serviced premises are located and be positioned adjacent to the public roadway.
- (4) Every waste generator shall maintain, at his own expense, unimpeded access to their waste containers, including the removal of ice, snow, mud, vehicles, pets and yard materials and, the sanding of icy patches.
- (5) Any person having garbage upon their premise or lands shall dispose of it in the manner prescribed by the Manager.
- (6) No person shall dispose of hot ashes, burning matter or loose waste in any waste container.

- (7) No person shall dispose of any explosive, inflammable, dangerous or hazardous waste in any waste container or any other place without the express authority of the Manager who shall designate the manner and place it shall be disposed of.
- (8) Household hazardous waste shall be stored by the residential waste generator until the Town holds a "Household Hazardous Waste Round-up" when these wastes shall be brought to an area prescribed by the Manager for disposal.
- (9) Subject to subsections (15) and (16) of this section, no person shall burn any waste of any nature within the boundaries of the Town. This excludes barbecues or cooking fires.
- (10) Any construction or building material being used or stored on private property must be stored on the said property, in a neat and orderly fashion or it may be defined as construction debris under the terms of this by-law.
- (11) Subject to subsection (12) of this section, all debris on a construction or work site must be segregated and placed in covered containers, on a daily basis, then hauled in a covered conveyance to the Town Land Fill site.
- (12) Where a waste container is not available, all debris on a construction or demolition site shall be segregated, hauled in a covered conveyance and disposed of at the Town Land Fill site on a daily basis.
- (13) Notwithstanding section 205. subsection (5) and (6), and subsections (8), (10), (11) and (12) of this section, no person other than the Town or its authorized contractor shall directly or indirectly remove and/or dispose of any residential waste within the boundaries of the Town.
- (14) Bulky wastes, generated by residential generators, must be segregated, removed and disposed of at the Town Landfill.
- (15) The Town may carry out controlled burning of waste for volume reduction and/or training.
- (16) The Fire Department may grant permission for the supervised burning of bon-fires on special occasions.
- (17) All premises which utilize a garbage room or building shall ensure that all waste is stored in secured and segregated waste containers.
- (18) Conditions of the operations and maintenance manual for the Town Land Fill site and directions of the Waste Facility Operator are to be strictly observed by all residential users.

#### 402. Commercial/Government/Industrial Waste

- (1) Every commercial, government or industrial generator of municipal type waste shall maintain, in good condition, sufficient covered or enclosed waste containers as per Town specifications.
- (2) All waste placed in a waste container must first be segregated then placed in garbage bags or baled.
- (3) All waste containers shall be kept within the property boundaries of the lot or parcel of land on which the serviced premises are located and be positioned adjacent to the public roadway.
- (4) Every commercial, government or industrial waste generator shall maintain, at his own expense, unimpeded access to their waste containers, including the removal of ice, snow, mud, vehicles, pets and yard materials and, the sanding of icy patches.
- (5) Any commercial, government or industrial establishment having litter or unsightly garbage upon their premise or lands shall dispose of it in the manner prescribed by the Manager.
- (6) No commercial, government or industrial establishment shall dispose of hot ashes, burning matter or loose waste in any waste container.
- (7) Subject to subsection (8) and (9) of this section, no commercial, government or industrial establishment shall dispose of any explosive, inflammable, dangerous or hazardous waste in any waste container or any other place without the express authority of the Manager who shall designate the manner and place it shall be disposed of.
- (8) Collection, transportation, handling, storage and disposal of commercially, governmentally or industrially generated hazardous waste is the sole responsibility of the generator and must be done in accordance with all applicable legislation.
- (9) Stockpiling of any commercially, governmentally or industrially generated hazardous waste must not be left to accumulate, within Town boundaries, for over four (4) years.
- (10) Subject to subsections (17) and (18) of this section, no commercial, government or industrial establishment shall burn any waste of any nature within the boundaries of the Town. This excludes barbecues or cooking fires.

- (11) Any construction or building material being used or stored on private property must be stored on the said property, in a neat and orderly fashion or it may be defined as construction debris under the terms of this by-law.
- (12) Subject to subsection (8) and (13) of this section, all construction debris on a construction or work site must be segregated and placed in covered containers, on a daily basis, then hauled in a covered conveyance to the Town Land Fill site.
- (13) Subject to subsection (8) of this section, where a waste container is not available, all debris on a construction or demolition site shall be segregated, hauled in a covered conveyance and disposed of at the Town Land Fill site on a daily basis.
- (14) Commercial establishments shall segregate, remove and dispose of all bulky wastes, generated by them, at the Town land fill.
- (15) The Town may dispose of construction debris and/or bulky wastes if it has not been properly disposed of within twenty four (24) hours of notification to do so, and the premise owner charged "at cost" for work performed by or on behalf of the Town.
- (16) Notwithstanding section 205. subsection (5) and (6), and subsections (7), (8), (12), (13) and (14) of this section, no person other than the Town or its authorized contractor shall directly or indirectly remove and/or dispose of any commercial, government or industrial municipal type waste within the boundaries of the Town.
- (17) The Town may carry out controlled burning of waste for volume reduction and/or training.
- (18) The Fire Department may grant permission for the supervised burning of bon-fires on special occasions.
- (19) All premises which utilize a garbage room or building shall ensure that all waste is stored in secured and segregated waste containers.
- (20) Conditions of the operations and maintenance manual for the Town Land Fill site and directions of the Waste Facility Operator are to be strictly observed by all commercial, government or industrial users.

## PART V, ENFORCEMENT

### 501. Penalty Provisions

- (1) A By-law Officer employed by the Town is authorized to issue a violation Ticket to any person who the By-law Officer has reasonable and probable grounds to believe and has contravened any provision in this By-law.
- (2) Any person who contravenes any provision of the By-law is guilty of an offence and is liable on summary conviction to a fine as set out in Schedule "A" of this By-law.
- (3) Any Commercial Business, Government or Industry who contravenes any provision of the By-law is guilty of an offence and is liable on summary conviction to a fine as set out in Schedule "B" of this By-law.
- (4) Every person who contravenes any of the provisions of this By-law is guilty of an offence, punishable on summary conviction and is liable to a fine of not less than One Hundred (\$100.00) Dollars or more than Two Thousand (\$2,000.00) Dollars and in default of fine imposed, a period of imprisonment not exceeding six (6) months.
- (5) Every Commercial Business, Government or Industry who contravenes any of the provisions of this By-law is guilty of an offence, punishable on summary conviction and is liable to a fine of not less than One Thousand (\$1000.00) Dollars or more than Ten Thousand (\$10,000.00) Dollars and in default of fine imposed, a period of imprisonment not exceeding six (6) months.
- (6) A By-law Officer who has reasonable and probable grounds to believe that a person, business, government or industry is violating or has violated any provision of this By-law may give such person written notice of intention to prosecute in the form of a ticket as defined in the Summary Convictions Act and amendments thereto, setting forth the date, and place of the offence; briefly stating the nature of the offence ; stating that payment may be made under section V of this By-law.
- (7) A person, business, government or industry who has received a ticket pursuant to section V in respect of an alleged offence under this By-law may after receipt of such ticket in lieu of prosecution under this By-law, pay to the Town such penalty as is set out in the appropriate Schedule "A" or "B" attached hereto and which forms part of this By-law.

PART VI, REPEAL

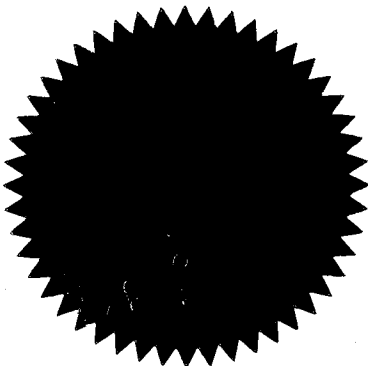
601. Repeal

(1) On the effective date this by-law repeals by-laws 169 and 333.

THIS BY-LAW NUMBER 341 IS READ A FIRST TIME this 13 day of March, 1995 A.D. by the Council of the Town of Iqaluit, N.W.T.

THIS BY-LAW NUMBER 341 IS READ A SECOND TIME this 13 day of March, 1995 A.D. by the Council of the Town of Iqaluit, N.W.T.

THIS BY-LAW NUMBER 341 IS READ A THIRD AND FINAL TIME this 27<sup>th</sup> day of MARCH, 1995 A.D. by the Council of the Town of Iqaluit, N.W.T.



i de  
MAYOR

[Signature]  
SENIOR ADMINISTRATIVE OFFICER

SCHEDULE "A" OF BY-LAW 341

FINES FOR INDIVIDUALS

<u>Sections</u>		<u>Amount</u>
205(4)10	indiscriminate disposal of hazardous waste	\$500.00
205(12)	littering	\$500.00
401(1)	failing to provide a waste container	\$100.00
401(2)	failing to place garbage in proper container	\$100.00
401(5)	failing to dispose as directed	\$250.00
401(6)	placing burning items in waste container	\$500.00
401(7)	placing hazardous waste in unsuitable container	\$500.00
401(9)	burning waste within town boundaries without permission of Fire department	\$500.00
401(10)	storing garbage on property in untidy manner	\$200.00
401(11)	unsegregated garbage	\$500.00
401(11)	uncontained construction debris	\$500.00
401(12)	hauling waste in uncovered conveyance	\$500.00
401(17)	unsecured waste storage container	\$200.00
401(18)	non-observation of directions	\$300.00

SCHEDULE "B" OF BY-LAW 341

FINES FOR CORPORATIONS

<u>Sections</u>	<u>AMOUNT</u>
205(4)10 indiscriminate disposal of hazardous waste	\$10,000.00
205(12) littering	\$ 5,000.00
402(1) failing to provide a waste container	\$ 1,000.00
402(2) failing to properly put garbage in container	\$ 1,000.00
402(5) failing to dispose as directed	\$ 2,500.00
402(6) placing burning items in waste container	\$ 2,500.00
402(7) unsuitable hazardous waste storage	\$10,000.00
402(8) improper hazardous waste procedures	\$10,000.00
402(9) stockpiling hazardous waste for over 4 yrs.	\$10,000.00
402(10) burning waste within town boundaries without permission of Fire department	\$ 5,000.00
402(11) storing garbage on property in untidy manner	\$ 2,000.00
402(12) unsegregated garbage	\$ 3,000.00
uncontained construction debris	\$ 5,000.00
402(12) & (13) hauling garbage in uncovered conveyance	\$ 5,000.00
402(19) unsecured or segregated waste storage	\$ 2,500.00
402(20) non-observation of directions	\$ 3,000.00

SCHEDULE "C" OF BY-LAW 341

TARIFFS AND FEES

- (1) Subject to subsection II, the rates payable by customers for collection and disposal of municipal type solid waste are as follows:

**CATEGORY OF CUSTOMER;**

Residential and Non-Profit;

(based on collections twice per week excluding Statutory Holidays)

- |    |  |             |
|----|--|-------------|
| 1. | - single and duplex units (separate storage)<br>(under 35 cubic feet)                  | \$27.50/M/U |
| 2. | - triplex to six-plex units (separate storage)<br>(under 35 cubic feet)                | \$27.50/M/U |
| 3. | - triplex to six-plex units (combined storage)<br>(35 cubic feet up to 200 cubic feet) | \$25.00/M/U |
| 4. | - Larger than six-plex (separate storage)<br>(under 35 cubic feet)                     | \$27.50/M/U |
| 5. | - larger than six-plex (combined storage)<br>(200 cubic feet and over)                 | \$22.50/M/U |

Commercial;

(based on five collections per week excluding Statutory Holidays)

- |     |   |              |
|-----|---|--------------|
| 6.  | - single business<br>(separate storage of 35 cubic ft. or under)                        | \$60.00/M/B  |
| 7.  | - single business<br>(separate storage of over 35 cubic ft.<br>and under 200 cubic ft.) | \$75.00/M/B  |
| 8.  | - single business<br>(200 cubic ft. & over)   | \$100.00/M/B |
| 9.  | - multiple businesses<br>(combined storage of under 200 cubic ft.)                      | \$70.00/M/B  |
| 10. | - multiple businesses<br>(combined storage of 200 cubic ft. & over)                     | \$65.00/M/B  |

Government/Industrial;

(based on five collections per week excluding Statutory Holidays)

- |     |  |              |
|-----|--|--------------|
| 11. | - separate storage of 35 cubic ft. or under                        | \$60.00/M/U  |
| 12. | - separate storage of over 35 cubic ft. and<br>under 200 cubic ft. | \$75.00/M/U  |
| 13. | - separate storage of 200 cubic ft. & over                         | \$100.00/M/U |

SCHEDULE "C" By-Law 341 continued

- |      |  |  |
|------|--|--|
| (2)  | Unscheduled garbage collection fee/collection  | \$125.00   |
| (3)  | Application for service fee                    | \$ 15.00   |
| (4)  | Reinstatement of service fee                   | \$ 15.00   |
| (5)  | Tipping fees at Town Land Fill;                |  |
|      | - up to 1/2 ton pick-up truck                  | \$ 5.00/load   |
|      | - over 1/2 ton to 1 ton pick-up truck          | \$10.00/load   |
|      | - over 1 ton to 15 ton truck                   | \$25.00/load   |
|      | - over 15 ton truck                            | \$35.00/load   |
|      | - car body                                     | \$10.00/car  |
|      | - pick-up truck body                           | \$15.00/truck  |
|      | - bulky items larger than pu truck body        | \$25.00/item   |
|      | - designated contractor fee                    | \$150.00/load  |
| (6)  | Wood salvage                                   | \$1.00/cubic ft.   |
| (7)  | Other miscellaneous salvage                    | Nominal fee to be determined   |
| (8)  | Recyclable materials                           | Market value at time of sale   |
| (9)  | Late payment fee                               | Interest will be charged at the same rate as that charged for overdue taxes as established by the prevailing Town Taxation By-Law. |
| (10) | Disposal of construction debris or bulky waste | "at cost"  |

NOTE; M = month  
B = business  
U = unit (single)

**THE CORPORATION OF THE CITY OF IQALUIT, NU**

**BY-LAW #544**

**AMENDMENT TO SOLID WASTE BY-LAW**

A By-law of the City of Iqaluit, a municipal corporation in Nunavut to waive municipal service charges for collection of waste, pursuant to the provisions of the Cities, Towns and Villages Act, R.S.N.W.T. 1988, c. C-8, s.65(1) and 85 (1)(d)

A by-law is necessary to waive municipal service charges for collection of waste due to non-collection during the labour dispute from April 17 to July 31, 2001 as it was not included in the Essential Service Agreement.

NOW THEREFORE, the Council of the City of Iqaluit in a session duly assembled, enacts as follows:

1. For a period of April 17, 2001 to July 31, 2001, only that Council waive municipal services collection charges for Residential, Commercial, Government and Industrial waste.

This By-law amends By-law 341 for a period of April 17, 2001 to July 31, 2001.

THIS BY-LAW READ A FIRST TIME this 14 day of August, 2001. A.D.

\_\_\_\_\_  
MAYOR

\_\_\_\_\_  
CHIEF ADMINISTRATIVE OFFICER

THIS BY-LAW READ A SECOND TIME this 14 day of August, 2001. A.D.

\_\_\_\_\_  
MAYOR

\_\_\_\_\_  
CHIEF ADMINISTRATIVE OFFICER

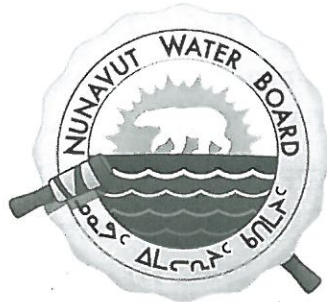
THIS BY-LAW READ A THIRD AND FINAL TIME this 28 day August, 2001.A.D.

\_\_\_\_\_  
MAYOR

\_\_\_\_\_  
CHIEF ADMINISTRATIVE OFFICER

# Appendix **F**

**Nunavut Water Board – Type “A” Water  
Licence No. 3AM-IQA1626**



08/12

# NUNAVUT WATER BOARD

TYPE "A" WATER LICENCE NO. 3AM-IQA1626



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**Licence No. 3AM-IQA1626**

Pursuant to the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to the

**CITY OF IQALUIT**

(Licensee)

**P.O. BOX 460 IQALUIT, NU X0A OHO**

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use Water or deposit Waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number / Type: **3AM-IQA1626 / TYPE "A"**

Water Management Area: **FROBISHER BAY WATERSHED (53)**

Location: **WITHIN CITY OF IQALUIT'S MUNICIPAL BOUNDARIES, QIKIQTANI REGION, NUNAVUT**

Classification: **MUNICIPAL UNDERTAKING**

Purpose: **USE OF WATERS AND DEPOSIT OF WASTE**

Quantity of Water not to be Exceeded: **1,100,000 CUBIC METRES ANNUALLY**

Date Licence Issuance: **JUNE 17, 2016**

Expiry of Licence: **JUNE 16, 2026**

This Licence issued (**Motion Number: 2016-02-P6-14**) and recorded at Goji Haven, Nunavut, includes and is subject to the annexed conditions.

Norman Mike  
Nunavut Water Board,  
Hearing Chair

**APPROVED**  
**BY:** Minister of Indigenous and  
Northern Affairs Canada

**APPROVAL**  
**DATE:** \_\_\_\_\_



**PART A: SCOPE, DEFINITIONS, AND ENFORCEMENT**

**1. SCOPE**

- a. This Type "A" Water Licence No. 3AM-IQA1626 ("Replacement and Amended Licence" or "Licence") authorizes the City of Iqaluit ("Licensee" or the "City") to use Water and deposit Waste in support of a Municipal undertaking, as classified under Schedule 1 of the *Regulations*, within the City's municipal boundaries at the following approximate geographic coordinates:

Undertaking	Latitude	Longitude
Overall Extents	63° 50' 56.31" N	68° 39' 49.87" W
	63° 50' 57.30" N	68° 33' 41.94" W
	63° 43' 48.91" N	68° 18' 12.53" W
	63° 41' 06.60" N	68° 18' 18.82" W
	63° 41' 04.08" N	68° 32' 44.20" W
	63° 44' 46.02" N	68° 39' 43.1 0" W
West 40 Landfill	63° 43' 58.15" N	68° 32' 08.54" W
Water Treatment Plant	63° 45' 12.24" N	68° 30' 22.79" W
Wastewater Treatment Plant	63° 44' 45.15" N	68° 32' 19.80" W

The scope of activities, works, and undertakings authorized in accordance with the terms and conditions of this Replacement and Amended Licence is as follows:

- a. Use, management, and protection of the Lake Geraldine drainage basin;
  - b. Management and protection of Waters surrounding the West 40 Landfill site;
  - c. Management, collection, and monitoring of leachate from the West 40 Landfill site and adjacent Sludge Management Facility;
  - d. Management of improved drainage works at the West 40 Landfill site;
  - e. Management, operation, and eventual closure and reclamation of the current West 40 Landfill site and associated solid waste disposal facilities;
  - f. Upgrades, operation, maintenance, monitoring, and eventual closure and reclamation of a Wastewater Treatment Plant (WWTP);
  - g. Operation, maintenance, monitoring, and eventual closure and reclamation of a Sludge Management Facility;
  - h. Operation, maintenance, monitoring and eventual closure and reclamation of a Sewage Lagoon Facility;
  - i. Implementation of contingency measures for the Wastewater and Landfill management facilities; and
  - j. Implementation of changes to the monitoring requirements including frequency, parameters, and stations being monitored.
- b. This Licence is issued subject to conditions contained herein with respect to the taking of Waters and the depositing of Waste of any type in any Waters or in any place under any



conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the Act, or other statutes imposing more stringent conditions relating to the quantity, type or manner under which any such Waste may be so deposited, this Licence shall be deemed to be subject to such requirements; and

- c. Compliance with the terms and conditions of this Licence does not absolve the Licensee from the responsibility for compliance with all applicable legislation, guidelines, and directives.

## 2. DEFINITIONS

- a. The Licensee shall refer to Schedule A for definitions of terms used in this Licence.

## 3. ENFORCEMENT

- a. Failure to comply with this Licence shall be a violation of the Act, subjecting the Licensee to the enforcement measures and the penalties provided for in the Act.
- b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the Act.
- c. For the purpose of enforcing the terms and conditions of this Licence with respect to the use of Water and deposit or Discharge of Waste in Waters, Inspectors appointed under the Act, hold all powers, privileges, and protections that are conferred upon them by the Act or by other applicable laws.

## PART B: GENERAL CONDITIONS

1. The Licensee shall file, with the Board for review, no later than the 31<sup>st</sup> of March of the year following the calendar year being reported, an Annual Report formulated in accordance with the requirements under Schedule B of this Licence.
2. The Licensee shall maintain a copy of this Licence at the Municipal Office, potable Water Treatment Facility, and the Waste Treatment Facilities at all times.
3. The Licensee shall file an application for renewal of this Licence at least one (1) year prior to the Licence expiry.
4. The Licensee shall, to the satisfaction of an Inspector, install, operate, and maintain metres, devices or other appropriate methods for measuring the volumes of Water used and Waste Discharged or deposited.



**Nunavut Water Board | Type "A" Water Licence No: 3AM-IQA1626**

5. The Licensee shall post the necessary signs to identify the stations of the Monitoring Program included under Schedule I of this Licence. All signage shall be in the Official Languages of Nunavut.
6. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted cannot be undertaken without subsequent written approval and/or directions from the Board. The Board may alter or modify a Plan if necessary to achieve legislative objectives and will notify the Licensee in writing of acceptance, rejection, or alteration of the Plan.
7. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.
8. The Licensee shall, within thirty (30) days of notification or within the timeframe specified by the Board, submit for review and/or Board's approval revisions for any plan found to be unacceptable to the Board.
9. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of the Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board shall also become part of the Licence. All relevant terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.
10. The Licensee shall review the Plans referred to in this Licence as required by changes in operation and/or technology and modify the Plans accordingly. Revisions to any Plan shall be submitted in the form of an addendum to be included within the Annual Report required under Part B, Item 1, complete with the lists of revisions detailing where significant content changes are made.
11. The Licensee shall immediately report to the NWT/NU 24-Hour Spill Report Line (867-920-8130) any spills of Waste associated with the Undertakings under this Licence including the potable Water Treatment Facility and Waste Treatment Facilities, which are reported to or observed by the Licensee.
12. Any communication with respect to this Licence shall be made in writing to the attention of:

Manager of Licensing  
Nunavut Water Board  
P. O. Box 119  
Goji Haven, NU X0B 1J0  
Telephone: (867) 360-6338  
Fax: (867) 360-6369  
Email: [licensing@nwb-oen.ca](mailto:licensing@nwb-oen.ca)

13. Any notice made to an Inspector shall be made in writing to the attention of:



**Nunavut Water Board | Type “A” Water Licence No: 3AM-IQA1626**

Water Resources Officer  
Nunavut District, Nunavut Region  
P.O. Box 100  
Iqaluit, NU X0A 0H0  
Telephone: (867) 975-4295  
Fax: (867) 979-6445

14. The Licensee shall submit, to the Board for information or as otherwise directed, one (1) paper copy and one (1) electronic copy of all reports, studies, and Plans generated for the works, activities, and undertakings under this Licence. All Reports, studies or Plans submitted to the Board by the Licensee shall include an executive summary in English, Inuktitut, and French.
15. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the Board is received by the Board and maintain on file a copy of the acknowledgment of receipt issued by the Manager of Licensing or his/her designate.
16. This Licence is assignable as provided for in section 44 of the Act.
17. The expiry or cancellation of this Licence does not relieve the Licensee from any obligation imposed by the Licence, or any other regulatory requirement.

**PART C: CONDITIONS APPLYING TO SECURITY**

1. The Licensee is not required to post reclamation security for the activities, works, and undertakings authorized under this Licence.

**PART D: CONDITIONS APPLYING TO THE USE OF WATERS AND WATER MANAGEMENT PLANS**

1. The Licensee is authorized to withdraw, from the Lake Geraldine Reservoir at Monitoring Station No. IQA-01, up to 1,100,000 cubic metres of Water annually for the relevant activities, works, and undertakings authorized under the scope of this Licence.
2. The Licensee shall submit to the Board for approval, within sixty (60) days of the Effective Date of the Licence, an updated manual for the potable Water Treatment Facility. The Manual shall be prepared in accordance with relevant aspects of the format outlined in the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories* (GNWT, 1996). The manual shall, address among other items, the following:
  - a. Purpose of facility;
  - b. Site setting;



- c. Operational procedures for storage, treatment and distribution of potable Water; Waste generated and hazardous substances associated with the facility; site inspections; and personnel training;
  - d. Maintenance procedures including equipment servicing;
  - e. Sampling and monitoring requirements; and
  - f. Emergency response measures.
3. The Licensee shall equip all freshwater intake structures with screens of appropriate mesh size that meet the requirements of Fisheries and Oceans (DFO) Canada's *Freshwater Intake End-of-Pipe Fish Screen Guidelines* (1995 or the most current) so as to prevent the entrainment of fish and control Water withdrawal rates such that fish do not become impinged within the screens.
  4. The Licensee shall undertake Dam Safety Inspections (DSI) and/or Dam Safety Reviews (DSR) of the Lake Geraldine water supply facility in accordance with requirements of the Canadian Dam Association (CDA), *Dam Safety Guidelines* (2007, or the most current version). The Licensee shall submit for the Board's review, within the Annual Report required under Part B, Item 1, the report generated for the DSIs or DSRs along with the Licensee's recommended actions to address any deficiencies identified in the inspections and/or reviews.
  5. The Licensee shall not remove any material from below the ordinary High Water Mark of any Water body unless otherwise approved by the Board in writing.
  6. The Licensee shall not cause erosion to the banks of any body of Water and shall provide the necessary controls to prevent such erosion.
  7. The Licensee shall implement necessary measures to control sediment and erosion prior to and during operations to prevent entry of sediments into Water.
  8. The Licensee shall maintain the potable Water Treatment Facility in accordance with applicable guidelines, procedures, and regulations and to the satisfaction of an Inspector.
  9. The Licensee shall, as part of any proposal to supplement the Lake Geraldine Reservoir, evaluate the potential impact on freshwater resources, including fish and fish habitat. The results of the evaluation must be included as part of any application to augment the Lake Geraldine Reservoir with Water from proximal water bodies.

PART E: **CONDITIONS APPLYING TO THE DEPOSIT OF WASTE AND WASTE MANAGEMENT PLANS**

1. The Licensee is authorized to use the Sewage Lagoon Facility and the Wastewater Treatment Plant to treat and dispose of Wastewater generated by the Undertaking authorized under this Licence until such time that the Upgraded Wastewater Treatment Plant authorized by the



Licensee is constructed and commissioned, or as otherwise approved by the Board in writing.

2. The Licensee shall provide written notice to an Inspector and the Board at least ten (10) days prior to any planned Discharges from the Solid Waste Facility, Sewage Lagoon Facility, Wastewater Treatment Plant, and the Upgraded Wastewater Treatment Plant once commissioned.
3. The Licensee shall establish the relevant monitoring stations for the facilities authorized under this Licence in accordance with Schedule I.
4. The Licensee shall ensure that Surface Drainage or surface Water runoff associated with site activities or generated during the construction of any facility designed to withhold, divert, or retain Water or Waste, does not exceed the following Effluent criteria:

Parameter	Maximum Average Concentration	Maximum concentration of Any Grab Sample
Total Suspended Solids (TSS)	50.0 mg/L	100.0 mg/L
pH	Between 6 and 9.	

5. Upon commissioning of the Upgraded Wastewater Treatment Plant, the Sewage Lagoon Facility shall be used as a back-up facility or closed and reclaimed in accordance in Part J, Item 4.
6. The Licensee shall submit to the Board for approval in writing, within four (4) months of the Effective Date of the Licence, an Operation and Maintenance Manual for the Sewage Lagoon Facility that addresses requirements for both the Sewage Lagoon and Sludge Management Facilities. The manual shall be prepared in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories* (GNWT, 1996).
7. The Licence shall submit to the Board for approval in writing, by December 21, 2018 or as otherwise directed by the Board in writing, an Operations and Maintenance Manual for the Upgraded Wastewater Treatment Plant that incorporates the requirements of Part E, Item 6. The manual shall be prepared in accordance with the *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories* (GNWT, 1996).
8. The manual referred to in Part E, Item 7 shall supersede the manual referenced in Part E, Item 6, following approval by the Board in writing.
9. The Licensee shall submit to the Board for approval in writing, by December 31, 2018, an updated version of the plan entitled *City of Iqaluit Solid Waste Management Plan*, dated January 2014 that addresses relevant intervener’s comments and recommendations made during the licensing process, such as inclusion of details related to future uses of the landfill, timeframe for closure, and ongoing activities within the scope of this Licence.



10. The Licensee shall undertake Dam Safety Inspections (DSI) and/or Dam Safety Reviews (DSR) of the Wastewater Treatment Facilities in accordance with requirements of the Canadian Dam Association (CDA), *Dam Safety Guidelines* (2007, or most current version). The Licensee shall submit for the Board's review, within the Annual Report required under Part B, Item 1, the report generated for the DSIs or DSRs along with the Licensee's recommended actions to address any deficiencies identified in the inspections and/or reviews.
11. The Licensee shall dispose of and contain all municipal solid waste generated by the City at the West 40 Landfill as associated site(s) authorized under this licence or as otherwise approved by the Board in writing.
12. The Licensee shall submit to the Board for approval, within sixty (60) days of the Effective Date of the Licence, an updated Landfill Operation and Maintenance Manual that addresses concerns raised by intervening parties during the licensing process including the following:
  - a. Management of Leachate from the facility;
  - b. Updated sampling and monitoring requirements; and
  - c. Open burning practices.
  - d. Ongoing activities within
13. The Licensee shall collect and contain all leachate generated by the West 40 Landfill within the Landfill.
14. The Licensee shall submit to the Board for review, by December 31, 2017, an updated version of the document entitled *West 40 Landfill Drainage Management Review*, dated September 16, 2011, that addresses the concerns raised by intervening parties including information on the absence of permafrost related data.
15. The Inspector may authorize an emergency Discharge, following the Licensee's written submission to the Inspector and to the Board, at least fifteen (15) days prior to discharge or as instructed by the Inspector, that includes the following information:
  - a. Proposed quantity of discharge;
  - b. Reason for discharge;
  - c. Identification of the Final Discharge Location;
  - d. Proposed sampling and analysis to be conducted; and
  - e. Proposed mitigation measures to implemented.
16. The Licensee shall submit to the Board and the Inspector for review, within sixty (60) days following any emergency Discharge authorized by the Inspector, a report that includes, among other items, an analysis of results for the emergency Discharge.
17. The Licensee shall maintain the Licensed Facilities to the satisfaction of an Inspector.



18. The Licensee shall remove from the site associated with the undertaking, all Hazardous Wastes, waste oil and non-combustible waste generated through the course of the operation, for disposal at a licensed waste disposal facility.
19. The Licensee shall maintain records of all Waste removed from site and records of confirmation of proper disposal of removed Waste. These records shall be made available to an Inspector or the Board upon request.

**PART F: CONDITIONS APPLYING TO CONSTRUCTION**

1. The Licensee shall, submit to the Board for review, within thirty (30) days prior to commencing construction of any facilities or infrastructure authorized under this Licence, for-construction designs and drawings, signed and stamped by an Engineer.
2. The Licensee shall ensure that all relevant approved facilities are designed and constructed to engineering standards such that, at a minimum, they comply with the most current version of the *Canadian Dam Safety Guidelines*.
3. The Licensee shall implement measures to ensure that all materials used in the construction of relevant facilities or infrastructure included under the scope of this Licence are free of contaminants, to the extent that they do not cause harmful or significant effects to Water.
4. The Licensee shall maintain shoreline stability during construction.
5. The Licensee shall ensure that all final designs and drawings are qualified by an Engineer confirming that:
  - a. Works are designed under sound engineering principles;
  - b. Design limitations are understood and communicated within the report; and
  - c. Measures are implemented to minimize impact to Water.
6. The Licensee shall, submit to the Board for review, within ninety (90) days of completion of any structure authorized under this licence, to contain, withhold, divert or retain Water or Wastes; a construction summary report prepared by an Engineer that includes, among other relevant information, as-built drawings, documentation of field decisions that deviated from original plans, and any data used to support these decisions.
7. The Licensee shall, if contamination of surface and/or ground water is encountered during construction and excavation, notify the Inspector immediately and implement the Spill Contingency Plan.
8. The Licensee shall develop and implement measures necessary to prevent and mitigate erosion and/or the release of sediment into Water during the construction of the Upgraded Wastewater Treatment Plant or during any construction activities associated with the Undertaking.



**PART G: CONDITIONS APPLYING TO MODIFICATIONS**

1. The Licensee may, without written consent from the Board, carry out Modifications to the potable Water Treatment Facility and Waste Treatment Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:
  - a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
  - b. Such Modifications are consistent with the NPC Land Use Planning (NPC) Conformity Determination and the NIRB Screening Decision;
  - c. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
  - d. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
  - e. The Board has not rejected the proposed Modifications.
2. Modifications for which all of the conditions referred to in Part G, Item 1 have not been met can be carried out only with written approval from the Board.
3. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modifications. These plans and drawings shall be stamped by an Engineer.

**PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING**

1. The Licensee shall, submit to the Board for approval in writing, within thirty (30) days of the Effective Date of this Licence, an amalgamated and updated Spill Contingency Plan. The Plan shall address spill contingency planning requirements for all relevant aspects of works, activities, and undertakings associated with the scope of this Licence including the Sewage Lift Station.
2. The Licensee shall, subject to section 16 of the Regulations, report any unauthorized deposits of Waste or foreseeable unauthorized deposits of waste and/or Discharges of Effluent, and:
  - a. Employ, as required, the approved Spill Contingency Plan;
  - b. Report the incident immediately via the NWT/NU 24-Hour Spill Reporting Line (867) 920-8130 and to the Inspector at (867) 975-4295; and
  - c. For each spill occurrence, submit a detailed report to the Inspector, no later than thirty (30) days after initially reporting the event. The report shall include the amount and



type of spilled product, the GPS location of the spill, and the measures taken to contain, clean up and restore the spill site.

3. The Licensee shall, in addition to Part H, Item 2, regardless of the quantity of release of a harmful substance, report to the NWT/NU Spill Line if the release is near or into a Water body.

**PART I: CONDITIONS APPLYING TO MONITORING**

1. The Licensee shall monitor the relevant potable Water Treatment Facility and Waste Treatment Facilities authorized under this Licence in accordance with requirements included under Schedule I.
2. The Licensee shall, submit Board for approval in writing, within sixty (60) days of the Effective Date of this Licence, an updated Monitoring Program that addresses monitoring requirements for the Water Treatment Facility and Waste Treatment Facilities. The Monitoring Program shall address, among other items, the requirements outlined in Schedule I.
3. All analyses required under Schedule I shall be conducted using methods as described in the most recent edition of "*Standard Methods for the Examination of Water and Wastewater*", or by such other methods as approved by the Board in writing.
4. All laboratory analyses shall be performed at a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.
5. The Licensee shall, submit to the Board for review, within sixty (60) days of the Effective Date of the Licence, an updated Quality Assurance/Quality Control (QA/QC) Plan prepared in accordance with *Quality Assurance (QA) and Quality Control (QC) Guidelines for Use by Class "A" Licensees in Meeting SNP Requirements and for Submission of a QA/QC Plan* (INAC, 1996 or most current version). The updated plan shall be accompanied by a letter from an Analyst of an accredited laboratory confirming acceptability of the Plan.
6. The Licensee shall measure by instrument and record in cubic metres, the monthly quantities of freshwater extracted from the Lake Geraldine Reservoir, at Monitoring Program Station No. IQA-01, used for all purposes under this Licence.
7. The Licensee shall measure, by instrument and record in cubic metres, the quantities of Effluent released from the Sewage Lagoon Facility at Monitoring Station No. IQA-02, Wastewater Treatment Plant and/or Upgraded Wastewater Treatment Plant at Monitoring Station No. IQA-04 and the West 40 Landfill at Monitoring Station No. IQA-08.
8. The Licensee shall measure and record in cubic metres, the monthly and annual volumes of sludge removed from the Wastewater Treatment Facilities.



9. The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations of sources of Water utilized and Waste deposited under this Licence.
10. The Licensee shall include all of the data and information required by the Monitoring Program under Schedule I within the Annual Report required under Part B, Item 1 of the Licence or as otherwise requested by an Inspector and/or the Board.
11. Additional Monitoring may be requested by the Board and/or the Inspector.
12. The Monitoring Program and compliance dates specified in the Licence may be modified at the discretion of the Board in writing and do not constitute an application for Amendment as defined in the *Act*.

**PART J: CONDITIONS APPLYING TO CLOSURE AND RECLAMATION**

1. The Board has accepted the document entitled *Iqaluit Solid Waste Management Plan West 40 Landfill Decommissioning Technical Memorandum*, dated January 2014, submitted as additional information with the Application.
2. The Licensee shall submit to the Board for approval in writing, at least one (1) year prior to commencing the decommissioning of the West 40 Landfill, a Final Closure and Reclamation Plan prepared by an Engineer in accordance with industry's best practices and relevant guidelines.
3. The Licensee shall, for the Plan required under Part J, Item 2, include a presentation of data and a discussion of environmental conditions existing before the use of the site by the Licensee as a municipal landfill, as well as remediation objectives.
4. The Licensee shall notify the Board in writing, at least one year prior to the implementation of final closure, of its intentions to proceed with final closure of any Water use or Waste disposal facilities included within the scope of this Licence, excluding the Facility under Part J, Item 2.



## **SCHEDULES**

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Schedule A: Scope, Definitions, and Enforcement

Schedule B: General Conditions

Schedule C: No Schedule for Security

Schedule D: No Schedule for Use of Water and Water Management Plans

Schedule E: No Schedule Waste Disposal and Waste Management Plans

Schedule F: No Schedule for Construction

Schedule G: No Schedule for Modifications

Schedule H: No Schedule for Spill Contingency Planning

Schedule I: Monitoring

Schedule J: No Schedule for Closure and Reclamation



**Schedule A: Definitions**

In this Licence, 3AM-IQA1626:

“**Act**” means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“**Addendum**” means the supplemental text that is added to a full plan, manual, or report, usually included at the end of the document and is not intended to require a full resubmission of the revised report. It may also be considered as an appendix or supplement;

“**Amendment**” means a change to any terms and conditions of this Licence through application to the NWB, requiring a change, addition, or deletion of specific terms and conditions of the Licence not considered as a modification;

“**Analyst**” means an Analyst designated by the Minister under section 85 (1) of the *Act*;

“**Annually**” means, in the context of monitoring frequency, one sampling event occurring every 365 days with a minimum of 200 days between sampling events;

“**Application**” means, for the purposes of this License, the totality of the NWB Public Register opened as a result of the filing of the application to replace and amend expired Water Licence 3AM-IQA0611(3AM-IQA0612);

“**Biannually**” means, in the context of the monitoring frequency, two sampling events occurring per calendar year, with a minimum of 150 days and a maximum of 210 days between sampling events;

“**Board**” means the Nunavut Water Board established under Article 13 of the *Nunavut Land Claims Agreement* and under section 14 of the *Act*;

“**Discharge**” means the release of any Water or Waste to the receiving environment;

“**Effective Date**” means the date on which the Minister of Indigenous and Northern Affairs Canada approves the Licence;

“**Effluent**” means treated or untreated liquid Waste material that is Discharged into the environment from the site water management facilities such as a settling pond or a treatment plant;

“**Engineer**” means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act S. Nu 2008, c.2* and the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

“**Engineered Structure**” means any facility, designed and approved by a Professional Engineer who is registered with the Association of Professional Engineers, Geologists and Geophysicists of Nunavut;



“**Grab Sample**” means an undiluted quantity of material collected at a particular time and place that may be representative of the total substance being sampled at the time and place it was collected;

“**Greywater**” means the component of Effluent produced from domestic use (i.e. washing, bathing, food preparation and laundering), excluding Sewage;

“**Hazardous Waste**” means materials or contaminants categorized as dangerous goods under the *Transportation of Dangerous Good Act* (1992), no longer used for their original purpose and intended for recycling, treatment, disposal or storage at appropriate facilities;

“**High Water Mark**” means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land (ref. *Department of Fisheries and Oceans Canada, Operational Statement: Mineral Exploration Activities*);

“**Inspector**” means an Inspector designated by the Minister under section 85 (1) of the Act;

“**Licence**” means this Type “A” Water Licence No. 3AM-IQA1626, issued by the Nunavut Water Board to the City of Iqaluit in accordance with the Act;

“**Licensee**” means the entity to whom Licence No. 3AM-IQA1626 is issued or assigned;

“**Minister**” means the Minister of Indigenous and Northern Affairs Canada (INAC);

“**Modification**” means an alteration to a physical work that may introduce a new structure or eliminates an existing structure and does not alter the purpose or function of the work;

“**Monitoring Program**” means the program to collect data on surface water and groundwater quality to assess impacts to the environment of an appurtenant undertaking;

“**Monthly**” means, in the context of monitoring frequency, one sampling event occurring within calendar month with a minimum of twenty-one (21) days between sampling events;

“**Nunavut Land Claims Agreement**” (NLCA) means the “*Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*,” including its preamble and schedules, and any Amendments to that agreement made pursuant to it;

“**Quality Assurance / Quality Control (QA/QC)**” Quality Assurance means the system of activities designed to better ensure that quality control is done effectively; Quality Control means the use of established procedures to achieve standards of measurement for the three principle components of quality: precision, accuracy and reliability;



**"Quarterly"** means divisions of the calendar year, comprised of three month intervals from January to December, inclusive (January – March, April – June, July – September and October – December);

**"Regulations"** means the *Nunavut Waters Regulations* (SOR/2013/669 18<sup>th</sup> April, 2013);

**"Sewage"** means all toilet wastes and greywater;

**"Sewage Lagoon Facility"** refers to the waste disposal facility and associated structures designed and constructed to treat Sewage in the City of Iqaluit since 1978, which has also been upgraded in subsequent years;

**"Sludge Management Facility"** means the facility located within the West 40 Landfill that is used for the disposal and treatment of sludge generated by the Wastewater Treatment Plant;

**"Solid Waste Facility"** means the West 40 Landfill, Sludge Management Facility and all other facilities identified in the Application that are designed and constructed to manage solid waste generated by the City of Iqaluit;

**"Surface Drainage"** means all surface waters resulting from the flow over, through or out of an operations area and is collected by means of Engineered structures;

**"Undertaking or Undertakings"** means an undertaking or undertakings in respect of which Water is to be used or Waste is to be deposited, as classified in Schedule 1 of the *Regulations*;

**"Upgraded Wastewater Treatment Plant (UWWTP)"** means the current Wastewater Treatment Plant, which was designed, constructed, and commissioned under Phase 1, for the preliminary treatment of Wastewater, in addition to the infrastructure scheduled for construction and commissioning by December 2018, under Phase 2, for the secondary treatment of Wastewater as described in the Application;

**"Use"** means use as defined in section 4 of the Act;

**"Waste"** means Water as defined in section 4 of the Act;

**"Waste Treatment Facilities"** refers to all facilities constructed and operated by the City of Iqaluit to manage solid and liquid Waste associated with this licence.

**"Wastewater"** means the water generated by site activities or originates on-site that requires treatment or any other water management activity;

**"Wastewater Treatment Facilities"** means the Sewage Lagoon, Wastewater Treatment Plant, Upgraded Wastewater Treatment Plant and associated facilities authorized under this Licence;



**"Wastewater Treatment Plant"** means the engineered system, located adjacent to the Sewage Lagoon Facility that is designed for the containment and preliminary treatment of Sewage generated by the City of Iqaluit as described in the Application;

**"Water or Waters"** means water as defined in section 4 of the *Act*;

**"Water Treatment Facility"** means the engineered facilities and appurtenances designed and constructed for the withdrawal storage treatment and distribution of fresh water for domestic purposes, described in the Application; and

**"West 40 Landfill"** means the Solid Waste Facility or original landfill facility along with its Northern Expansion and Sludge Management Facility that is designed to manage solid waste generated by the City of Iqaluit.



**Schedule B: Annual Reporting Requirements**

The Annual Report referred to in Part B, Item 1, shall include the following:

- a. The monthly and annual quantities in cubic metres of fresh Water withdrawn from the Lake Geraldine Reservoir at Monitoring Station No. IQA-01;
- b. The monthly and annual quantities in cubic metres of any Discharges from the Wastewater Treatment Facilities at Monitoring Stations IQA-02, IQA-04, and IQA-08;
- c. Copy of reports generated from Dam Safety Inspections and Dam Safety Reviews along with the Licensee's proposed actions to address issues identified and/or updates on continuing actions to address issues;
- d. The monthly and annual quantities in cubic metres of sludge removed from the Wastewater Treatment Facilities;
- e. The monthly and annual quantities of Wastes disposed of at the West 40 landfill;
- f. A summary report which includes all data and information generated under the Monitoring Program, including the QA/QC program, in electronic and printed formats acceptable to the Board;
- g. A summary of all construction activities carried out for facilities under the Licence;
- h. A summary of modifications and/or major maintenance work carried out on the potable Water Treatment and Waste Treatment Facilities, including all associated structures;
- i. A progress report and revisions (if applicable) to any studies requested by the Board that relate to Waste management, Water use or reclamation and a brief description of any future studies planned by the Licensee including, a non-technical executive summary for the general public, translated into Inuktitut;
- j. Any revisions required, in the form of addenda, to Plans, Manuals and Reports approved under the Licence;
- k. A list and description, including volumes and Spill Report Line Identification Number, of all un-authorized Discharges, spills and summaries of follow-up action taken;
- l. A summary of any closure and reclamation work undertaken and an outline of any work anticipated for the next year, including any changes to implementation and scheduling;
- m. A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector;
- n. A brief update on the implementation plan of all facilities within the scope of this Licence including changes projected implementation and status of the Upgraded Wastewater Treatment Plant;
- o. A summary of any studies, reports and plans requested by the Board that relate to Waste disposal, Water use or reclamation and a brief description of any future studies planned; and
- p. Any other details on the use of Water or Waste disposal requested by the Board by November 1<sup>st</sup> of the year being reported.



**Schedule I: Condition Applying to Monitoring**

Table 1 – Water Quality Parameters		
Test Groups	Analytical Parameters	Units
Routine (R)	Alkalinity, Acidity, Chloride, Carbonate, Bicarbonate, Total Hardness, Hydroxide, Sulphate, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Total Organic Carbon (TOC), Total Inorganic Carbon (TIC)	mg/L
	pH (field and lab)	pH units
	Oxidation-Reduction Potential (ORP) (field)	mV
	Conductivity (field and lab)	uS/cm
	Temperature (field)	°C
	Turbidity	NTU
Effluent (E)	Total Suspended Solids (TSS)	mg/L
	Temperature (field)	°C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Acute Lethality (AL)	Based on Environment Canada’s <i>Procedure for pH Stabilization During the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout</i> (EPS 1/RM/50, March 2008), if single concentration test fails and unionized ammonia concentration is less than or equal to 1.25 mg/L	“Pass” / “Fail”
ICP- Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	mg/L
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	mg/L
Biological (B)	Biochemical Oxygen Demand	mg/L
	Total and Fecal Coliform	CFU/100 mL
Potable Water (PW)	Fecal Coliform	CFU/100 mL
	ICP Metals (Total and dissolved)	mg/L
	Total Suspended Solids –TSS	mg/L
Flow (F)	Volume	m <sup>3</sup>
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs) Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	mg/L



Table 2<sup>1</sup> - Water Quality Monitoring Criteria

Station ID	Description	Status	Parameter	Testing / Measurement Frequency	Reporting Frequency
IQA-01	Lake Geraldine Reservoir – Raw Water	Active	R, PW	Monthly	Biannually
			F	Monthly	
IQA-01(#)	Based on Part I, Item 4 of Expired Licence	Inactive	N/A	N/A	N/A
IQA-02	Sewage Lagoon – Effluent Discharge Point	Active	B, N, E, ICP	Once prior to discharge; once during discharge; and once prior to the completion of discharge	Annually
			F	During decant	
IQA-03	Sewage Lagoon – Influent	Inactive	N/A	N/A	N/A
IQA-04	Wastewater Treatment Plant - Effluent	Active	B, N, E, ICP	Quarterly – Prior to commissioning of the WWTP	Annually
			B, N, E, ICP	Monthly – Following commissioning of the WWTP	
			AL	Annually – following commissioning of the WWTP	
			F	During Discharge	
IQA-05	Wastewater Treatment Plant - Influent	Active	B, E, N, ICP	Biannually – Prior to commissioning of the WWTP	Annually
				No testing requirements following commissioning of the WWTP	N/A
IQA-06	Sludge – From WWTP	Active	B, E, N, ICP	Quarterly	Annually
IQA-07	Surface Water entering West 40 Landfill – Based on Part E, Item 4 of the Expired Licence	Inactive	N/A	N/A	N/A



Station ID	Description	Status	Parameter	Testing / Measurement Frequency	Reporting Frequency
IQA-08	West 40 Landfill – Effluent Discharge Point, Based on Part E, Item 4 of the Expired Licence	Active	B, E, N, ICP, F, LS	Once prior to discharge; once during discharge; and once prior to the completion of discharge	Annually
			F	During Discharge	
IQA-08(#)	Based on E, Item 17, Part F, Item 10 & Part I, Item 4 of the Expired Licence	Inactive	N/A <sup>2</sup>	N/A	N/A
IQA-08A	Station situated up-gradient of West 40 Landfill	Active	B, E, N, ICP, F, LS	Annually	Annually
IQA-08B	Station situated down-gradient of West 40 Landfill	Active			
IQA-09	Contaminated soil accepted at the West 40 Landfill	Inactive	NA	N/A	N/A

<sup>1</sup> Table 2 may be modified by the Board and re-issued where necessary. Re-issuance is not considered an Amendment to the application or Licence as defined in the *Act*.

<sup>2</sup> Means not applicable



# Appendix **G**

## Landfill Emergency Response Plan

# Landfill Emergency Response Plan

## 1. Overview

### 1.1 Introduction

The purpose of the landfill emergency response plan sets out appropriate procedures to address foreseeable emergencies. The key elements of this plan are:

1. What is the nature and severity of the emergency?
2. What is to be done?
3. Who does it?

The emergency response plan addresses the following items:

- Fires (Section 2);
- Accidents and Medical Emergencies (Section 3); and
- Environmental and Operational Emergencies (Section 4).

### 1.2 Emergency Plan Updates

The Departments of Public Works, and Emergency and Protective Services will review the emergency plan annually or following an emergency incident to ensure that:

- Emergency response procedures for the landfill are effective and updated as necessary;
- Appropriate individuals are appointed to manage emergency situations;
- Regular fire prevention meetings are conducted with all landfill employees and the Fire Department; and
- Regular safety and emergency meetings are held with landfill employees.

### 1.3 Emergency Coordination

The key to success of the emergency plan is to assign a responsible person to take charge of an emergency situation. The Landfill Foreman is designated to have the primary responsibility to manage emergency situations at the landfill.

The Landfill Foreman will have full authority of the emergency until Emergency and Protective Services arrives. This, together with proper training of operating personnel, practice drills to test emergency response activities, and continual review and updating of the plan, will be undertaken to ensure an efficient and effective response to any emergency that may occur.

The Landfill Foreman's responsibilities include to:

- Declare an emergency;
- Review and update the emergency response procedures;
- Ensure that all emergency response procedures are appropriate;

- Respond to all emergencies and contact appropriate emergency response agencies;
- Establish control of the emergency prior to the arrival of appropriate emergency response agencies;
- Direct personnel and site visitors to a safe marshalling area;
- Liaise with the emergency response representatives upon their arrival;
- Correct any potential emergency or unsafe situations; and
- Complete necessary documentation with respect to emergencies.

The Landfill Foreman will report any emergency or contingency situations to the Superintendent. The Superintendent will contact appropriate agencies to report incidents related to environmental or health and safety issues associated with the emergency or contingency activities.

## 2. Evacuation Procedures

In the event that an area or structure at the landfill must be evacuated due to a fire, gaseous, or other situations, landfill employees, customers, and site visitors will be evacuated via the closest exit and will proceed to a designated marshalling area.

In the event of a fire or gaseous release from active areas of the landfill, the Landfill Foreman will direct all staff and site visitors to immediately leave the area and proceed to the designated marshalling area. Visitors will be requested to remain at the marshalling area until otherwise notified.

The marshalling area is to be designated for each emergency situation according to the nature of the emergency, the location of the emergency, and the location of a safe exit route. A marshalling area must not be used when it is unsafe or is downwind of a fire or gaseous release.

Marshalling areas are:

1. Primary: The road outside the main gate and building; and
2. An alternate area designated by the Landfill Foreman.

When the evacuation is complete, the Landfill Foreman will proceed to the marshalling area.

The prime consideration for the Landfill Foreman is to ensure that all employees and site visitors are safely evacuated. The Landfill Foreman will:

- Await appropriate emergency response personnel; and
- As required, establish perimeter security, conduct searches, and/or take other actions that may be warranted by specific circumstances.

It is imperative that all employees and visitors remain at the marshalling area until the Landfill Foreman gives permission to return to the working disposal areas or to leave the site.

## **3. Fire**

### **3.1 Fire Prevention**

The landfill will be operated in a manner that will minimize the potential for landfill fires. Fire prevention techniques will include:

- Thoroughly compacting all waste;
- Maintaining a comprehensive load checking program to prevent the dumping of hot/burning, explosives or combustible waste;
- Maintaining a program of separating the dumping of ash barrels from general waste tipping face;
- Site inspection, in particular of the working face, with regard to any trail of smoke etc before finishing work;
- Training employees on early fire hazard recognition; and
- Conducting emergency response drills at least bi-annually, which are to be documented and reviewed with landfill staff.

NOTE: FOR ALL FIRE OCCURANCES, AN INCIDENT REPORT MUST BE COMPLETED AND FILED, WITH A COPY SENT TO THE SAFETY OFFICER

### **3.2 General Fire Response Procedures**

Fires may occur at the following locations:

- Fires in the site building;
- Fires in the recycling storage area or hazardous waste storage compounds; or
- Fires at the active landfill working face.

All fires will be reported as an emergency situation. Should an emergency occur, employees shall report to the primary marshalling area. Should the primary marshalling area be inaccessible, employees shall report alternate safe site as directed by the Landfill Foreman.

### **3.3 General Instructions**

The greatest danger lies not in fighting the fire, but in the panic that arises from a fire. Spend a few minutes getting a handle on the situation. A landfill fire will not travel fast, so a 10 minute delay is not going to make any difference to the outcome of the fire. Go through the steps to notify the appropriate authorities and follow the basic steps in the fire control plan, including:

- Contact other nearby employees;
- Summon the appropriate landfill equipment;
- Notify Emergency Services and tell them the location and type of fire and whether or not it looks like it will spread out of the immediate area;
- Notify surrounding property owners, particularly if it appears that the fire could spread beyond the landfill;
- When Emergency Services arrive, follow their instructions;
- Do not fight fire alone; and
- Do not place yourself or others in danger while fighting the fire.

### 3.4 General Fire-Fighting Guidelines

A landfill fire is controlled better with the use of a bulldozer and dirt. If it is safe to do so, dig out to the source and isolate the burning waste. Then either let it burn out or cover with dirt. Lots of water will not necessarily extinguish the fire and can cause more problems than it solves.

- Do not overuse water. Remember that most landfill fires can be controlled with a relatively small amount of water. In most cases, soil is more effective than water to smother the fire;
- If two or more water trucks are being used, try to use shifts so that at least one water truck is at the fire at all times;
- Do not waste time trying to fight a large fire with a fire extinguisher;
- Do not approach any fire with a tractor unless a water truck is close by for backup;
- Never risk personal injury or death attempting to save a machine or building; and
- Remember, SAFETY FIRST.

### 3.5 Small Contained Fires

- Do not attempt to fight a fire alone;
- Secure the area and re-direct customers to a safe area;
- Work with other site staff to extinguish the fire ONLY if safe to do so;
- If the fire becomes uncontained, or if it gives off toxic fumes, do not attempt to extinguish the fire; and wait for the Emergency Services to arrive.

### 3.6 Uncontained Fires

- Do not attempt to fight the fire;
- Follow evacuation procedures; and
- Call the Fire Department: (867) 979-5650.

### 3.7 Site Building Fires

#### Prevention

- Staff training and awareness.
- Coordination with the Fire Department.

#### Response

Action	Time Frame	Who?	Resources
Evacuate building	Immediately	All staff	
Call Emergency Services & Superintendent	Immediately	Landfill Foreman/Operator	
Secure area	Immediately	Landfill Foreman/Operator	

### 3.8 Fires at the Working Face

#### Prevention

- Staff training and awareness.
- Waste acceptance procedures and policies.
- Diversion of hot loads, combustible and/or explosive material from working face.
- Application of cover soils to minimize size of the active working face.

#### Response

Action	Time Frame	Who?	Resources
Evacuate and secure the area	Immediately	Landfill Foreman	Site staff
Call: <ul style="list-style-type: none"> <li>• Emergency Services</li> <li>• Superintendent</li> </ul>	Immediately	Landfill Foreman	Site staff
Isolate the burning wastes	As soon as it is determined safe to do so	Landfill Foreman Emergency Services	Landfill Equipment
Determine the nature and extent of the fire	Immediately	Landfill Foreman Emergency Services	Site staff
Excavate, remove, and soak the burning waste	As soon as it is determined safe to do so	Landfill Foreman and Emergency Services	Site staff Fire Department Water Truck Water pumps
Cover the burning area	Immediately after the source of burning waste has been excavated and removed, and as soon as it is safe to do so	Landfill Foreman and Emergency Services	Site staff Fire Department Landfill equipment
Appoint staff for fire guard	After fire is extinguished	Landfill Foreman	Site staff Fire Department
Confirm the fire is extinguished	Immediately	Landfill Foreman	Fire Department
Review the cause of fire and prepare appropriate mitigative measures	Within 1 month	Landfill Foreman Superintendent Director of Emergency and Protective Services	Site staff Fire Department

### 3.9 Stored Material Fires

#### Prevention

- Site security.
- Separation of stored materials according to the Fire Code.

#### Response

Action	Time Frame	Who?	Resources
Evacuate and secure the area	Immediately	Landfill Foreman	Site staff
Call: <ul style="list-style-type: none"> <li>• EMS</li> <li>• Superintendent</li> <li>•</li> </ul>	Immediately	Landfill Foreman Superintendent	Site staff
Determine the nature of the burning material and potential for emission of toxic fumes	Immediately	Landfill Foreman	Fire Department Safety Officer Superintendent Material Safety Data Sheets (MSDS)
Isolate the burning material	Immediately when safe to do so	Landfill Foreman Emergency Services	Fire Department Landfill Equipment
Determine the nature and extent of the fire	Immediately	Emergency Services	Site staff
Extinguish the fire as appropriate; according to the nature of the material	As soon as it is safe to do so	Emergency Services	Site staff Fire Department Landfill equipment Water truck Water pumps Safety Officer MSDS
Confirm the fire is extinguished	Immediately	Emergency Services	Fire Department
Review cause of fire and prepare appropriate mitigative measures	within 1 month	Landfill Foreman Superintendent Director of Emergency and Protective Services	Site staff Fire Department

## 4. Medical Emergencies

All injuries, even minor ones, should be considered important and should be reported as a safety incident to the Landfill Foreman.

First Aid should be applied in a manner that is appropriate to the nature of the injury. If the injury requires medical assistance, the individual should be taken to a medical emergency centre or an ambulance service contacted.

A medical doctor should be consulted for all injuries that may result in infections as a result of working with waste materials. This includes injuries such as cuts and scrapes, skin punctures with sharp items, and fire or chemical burns.

If the person injured on-site is a customer or visitor, Landfill Foreman employees are to provide any assistance necessary and will apply appropriate First Aid.

NOTE: FOR ALL MEDICAL EMERGENCY OCCURRENCES AN ACCIDENT/INCIDENT REPORT MUST BE COMPLETED AND FILED, WITH A COPY SENT TO THE SAFETY OFFICER AND WSCC.

#### 4.1 Minor Medical Injuries

##### Prevention

- Safety plan and procedures;
- Employee safety training and awareness; and
- First Aid training.

##### Response Plan

Action	Time Frame	Who?	Resources
Apply appropriate First Aid	Immediately	Trained First Aider	
Recommend that the injured person consult a physician	Immediately	Trained First Aider	
Take the injured person to a medical emergency centre or contact an ambulance service if deemed appropriate	Immediately	Trained First Aider Emergency Services	
Contact Safety Officer and Superintendent	Immediately	Landfill Foreman	
Report Injury to WSCC	Within 3 days	Landfill Foreman Safety Officer	
Record injury in the daily report	To the end of the work day	Landfill Foreman	Landfill Foreman
Review cause of the injury and prepare appropriate mitigative measures	Within 1 month	Landfill Foreman Superintendent Director of Emergency and Protective Services	Landfill Foreman Occupational Health and Safety Committee

## 4.2 Serious Medical Injury

### Prevention

- Safety plan and procedures.
- Employee safety training and awareness.
- First Aid training.

### Response Plan

Action	Time Frame	Who?	Resources
Assess site conditions for personal safety and safety of others, and take appropriate actions to secure unsafe areas	Immediately	Landfill Foreman Trained First Aider	Landfill Foreman
Attend to the injured person and apply First Aid	Immediately when safe to do so	Trained First Aider	
Contact: <ul style="list-style-type: none"> <li>• Emergency Services/ Ambulance</li> <li>• Superintendent</li> <li>• Safety Officer</li> <li>• WSCC</li> </ul>	Immediately	Trained First Aider Landfill Foreman	
Stay with the injured person until medical assistance arrives	Duration of medical emergency	Trained First Aider	
Report to WSCC	Within 24 hours	Landfill Foreman Safety Officer	
Record injury in the daily report	By the end of the work day	Landfill Foreman or Designated Alternate	Landfill Foreman
Conduct an investigation to determine the cause of injury and prepare appropriate mitigative measures	Investigate immediately following the incident Complete mitigative measures within 1 month of the incident	Landfill Foreman Superintendent Director of Emergency and Protective Services	Site Personnel Occupational Health and Safety

### 4.3 Vehicle or Equipment Accidents

All vehicle accidents should be reported to Municipal Enforcement and an investigation as to the cause should be carried out. Following the investigation, appropriate mitigative measure should be determined and implemented to avoid future accidents.

#### Prevention

- Safety plan and procedures.
- Employee safety training and awareness.
- Traffic control signs.
- Vehicle spotting during heavy traffic situations.

#### Response Plan

Action	Time Frame	Who?	Resources
Report the accident to the Landfill Foreman	Immediately	All employees	
If damage is minor, have the vehicle driver report the accident to the Iqaluit Municipal Enforcement Department	Immediately	Landfill Foreman	Accident Investigation Program
If the damage is significant, call the Iqaluit Municipal Enforcement Department	Immediately	Landfill Foreman	Accident Investigation Program
If an injury is involved, the RCMP ((867) 979-1111), and implement medical response actions	Immediately	Landfill Foreman	Accident Investigation Program
Secure the area for a follow-up investigation	Immediately	Landfill Foreman RCMP or Iqaluit Municipal Enforcement	Accident Investigation Program
Record the injury in the daily report	By the end of the work day	Landfill Foreman or Designated Alternate	Landfill Foreman Accident Investigation Program
Conduct an investigation into the cause of the accident and prepare appropriate mitigative measures	Within 1 month of the accident	Landfill Foreman Superintendent RCMP Director of Emergency and Protective Services	Occupational Health and Safety Accident Investigation Program

## 5. Environmental and Operational Contingencies

Environmental and Operational contingencies may vary in nature and degree of seriousness. Therefore, actual situations will dictate the appropriate actions and responses that should be undertaken. Generally, the response plan includes the following steps:

- Secure and contain the problem;
- Verify and validate the problem;
- Investigate the cause and potential risk;
- Assess appropriate corrective actions;
- Implement the corrective action; and
- Review operations procedures and preventative measures.

### 5.1 Spills

In the event of a spill, the Landfill Foreman is to immediately implement the spill response plan. The Superintendent should be notified of the nature of the release as well as the activities and corrective actions being taken.

A spill report must be filled out and sent to the Spill Line once the spill is contained and clean up has started. Please see Appendix B: Forms for a copy of the Spill Report Form that includes contact information.

### 5.2 Prohibited Wastes Delivered to the Landfill

#### Prevention

- Waste acceptance policies and procedures.
- Employee training and awareness.

#### Response Plan

Action	Time Frame	Who?	Resources
Deny entry of the load	Immediately	Landfill Foreman	Operations and Maintenance Plan Waste Acceptance Procedures NWB
Determine if load is safe for transport on local roads	Immediately	Landfill Foreman	Transport Canada Transport of Dangerous Goods Regulations
Inform the waste generator of the infraction	Immediately	Landfill Foreman	
Document the nature of incident and actions taken	Within 1 hour	Landfill Foreman	Daily Activity Log Book Hazardous Material Load Check Form
Review waste acceptance procedures and implement necessary mitigative measures	Within 1 month	Landfill Foreman Superintendent	Safety Officer

### 5.3 Prohibited Waste Discovered at the Landfill

#### Prevention

- Waste acceptance policies and procedures.
- Employee training and awareness.

#### Response Plan

Action	Time Frame	Who?	Resources
Isolate waste and cease operations in the area of the waste	Immediately	Landfill Foreman	Safety Officer Environmental Consultant
Construct containment around perimeter of the waste if necessary	Immediately	Landfill Foreman	Landfill equipment
Determine how to safely handle the waste	Immediately	Landfill Foreman	MSDS Safety Officer Superintendent
Determine source of waste, and if possible the waste hauler and generator	Within 1 week	Landfill Foreman	Daily Activity Log Book Staff observations Tipping Receipt Book
If identified, contact the hauler and waste generator to review options	Within 1 to 2 weeks	Landfill Foreman	
Document nature of incident and actions taken	Within 1 hour	Landfill Foreman	Daily Activity Log Book Hazardous Material Load Check Form
Inform Nunavut Water Board	When results have been confirmed	Landfill Foreman	
Review waste acceptance procedures and practices, and implement mitigative measures	Within 1 month	Landfill Foreman Superintendent	Safety Officer

## 5.4 Hot Loads Delivered to the Landfill

### Prevention

- Waste acceptance policies and procedures; and
- Employee training and awareness.

### Response Plan

Action	Time Frame	Who?	Resources
Direct the load to the designated area away from the working face	Immediately	Landfill Foreman	
Contain burning material within soil berms	Immediately	Operating staff	
Apply appropriate measures to extinguish the fire: wet, smother with soil, or allow to burn out	Within 1 hour	Landfill Foreman	Water truck Landfill Equipment
Monitor fire	For duration of fire	Landfill Foreman	
Remove extinguished material and dispose at working face	Within 2 to 3 days after being extinguished	Landfill Foreman	Landfill Equipment

## 5.5 Elevated Parameters Detected in Surface Water Monitoring System

### Prevention

- Annual groundwater monitoring program; and
- Environmental auditing.

### Response Plan

Action	Time Frame	Who?	Resources
Re-sample to verify or validate	Within 1 month	Landfill Foreman Environmental Consultant	Environmental Consultant Laboratory
Assess the nature and risk of the problem	Following re-sampling	Landfill Foreman Environmental Consultant	Environmental Consultant AANDC Water Inspector NWB
Investigate corrective measures	Following assessment of the problem	Superintendent	Environmental Consultant AANDC Water Inspector NWB
Implement corrective measures	Following assessment of the problem	Superintendent	Environmental Consultant AANDC Water Inspector NWB

## 5.6 Leachate Seepage through Cover System

### Prevention

- Minimize leachate generation by application of intermediate and final cover;
- Remove or penetrate intermediate cover before overfilling and/or implement vertical drain; and
- Prohibition of liquid waste disposal.

### Response Plan

Action	Time Frame	Who?	Resources
Isolate the area and implement containment to prevent leachate from entering off-site and on-site drainage systems	Immediately	Landfill Foreman	Environmental Consultant AANDC Water Inspector NWB
Investigate the cause of the seep	Within 2 days	Landfill Foreman	Environmental Consultant
Investigate corrective measures	Within 1 week	Landfill Foreman	Environmental Consultant AANDC Water Inspector NWB
Implement corrective measures	Within 2 weeks	Landfill Foreman	Environmental Consultant
Review operating procedures and revise if appropriate	Within 2 months	Landfill Foreman Superintendent	Environmental Consultant

## 5.7 Breach of the Final Cover System Prevention

- Inspection of final cover, twice a year, for vegetative growth, animal burrows, erosion, settlement, or cracking.

### Response Plan

Action	Time Frame	Who?	Resources
Identify the nature and significance of the problem	Within 1 month	Landfill Foreman	Environmental Consultant
Develop a corrective plan for the breach	Within 2 to 6 months	Landfill Foreman	Environmental Consultant
Reconstruct the breached area	Within 2 to 6 months	Landfill Foreman Superintendent	Environmental Consultant

## 5.8 Wind-Blown Litter

### Prevention

- Encourage covers on inbound loads;
- Maintain as small a working face as is practical;
- Maintain portable litter catchment fences around active areas; and
- Maintain perimeter fencing.

### Response Plan

Action	Time Frame	Who?	Resources
Review working face and litter catchment fence placement	Immediately	Landfill Foreman	Environmental Consultant
Implement off-site litter pick-up	Within 1 week	Landfill Foreman	Temporary staff
Implement on-site litter pick-up	Within 1 month	Landfill Foreman	Temporary staff
Review litter control program and revise if necessary	Within 2 month	Landfill Foreman Superintendent	Environmental Consultant

## 5.9 Extreme Dust Emissions

### Prevention

- Paved access road to disposal area;
- Controlled speed limits on on-site gravel roads;
- Road maintenance;
- Seed soil stockpiles;
- Cover inbound loads;
- Special handling procedures for waste loads prone to emission of dust; and
- Employee training and awareness.

**Response Plan**

Action	Time Frame	Who?	Resources
Apply water to road surfaces as necessary	Within 2 hours	Landfill Foreman	
Deposit dusty loads in sheltered area	Upon unloading	Vehicle Foreman	
Pre-wet waste load	Prior to delivery when pre-arranged with waste generator	Waste Generator	
Cover dusty wastes with other waste or soil	Immediately upon unloading	Landfill Foreman	
Review waste handling procedures with waste generator for a specific problem material	Immediately	Landfill Foreman Superintendent	

# Appendix **H**

## Spill Contingency Plan





**CITY OF IQALUIT**

**SPILL CONTINGENCY PLAN**

**UPDATED: MAY, 2016**



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## Glossary of Contact Information

<b>EXTERNAL ASSISTANCE – GOVERNMENT RESOURCES</b>	
<b>AGENCY</b>	<b>TELEPHONE #</b>
24-Hour Spill Line	(867)920-8130

<b>CITY OF IQALUIT</b>			
<b>CONTACT</b>	<b>PAGER #</b>	<b>WORK #</b>	<b>CELL #</b>
Dispatch	N/A	979-5650	-
Chief Administrative Officer (CAO)	N/A	979-5666	222-2953
Director of Public Works & Engineering	N/A	975-8509	222-2965
Operations Superintendent, Public Works	N/A	979-5631	222-2956
Manager of Engineering (Vacant)	N/A	-	-
Utilidor Manager	N/A	979-5632	222-2966
Utilidor on-call	32	N/A	222-3243
Garage/Roads Foreman	N/A	979-5668	N/A
Trucked Services Foreman	N/A	979-5612	222-2947

<b>EMERGENCY SERVICES</b>			
<b>CONTACT</b>	<b>PAGER #</b>	<b>WORK #</b>	<b>CELL #</b>
Dispatch	N/A	979-5650	-
Duty Officer (Fire/Ambulance)	N/A	979-4422	-
Fire Chief	N/A	979-5657	222-5073
Deputy Fire Chief	N/A	979-5650	222-2955
Deputy Fire Chief	N/A	979-5650	222-3981
Chief Municipal Enforcement Officer	N/A	979-5670	222-5521
RCMP	N/A	979-1111 979-0123	

<b>CONTRACTOR</b>	<b>CONTACT #</b>
Baffin Building Systems (BBS)	979-5903
Kudlik Construction Ltd	979-1166
Nunavut Excavating Ltd	975-3320
RL Hanson	979-6004
Tower Arctic Ltd	979-6465
Qikiqtaaluk Environmental (QE)	
Nunatta Environmental	

<b>CONTRACTOR</b>	<b>CONTACT #</b>
Environmental Protection, Government of Nunavut	975-5900
Indian and Northern Affairs Canada, Nunavut District Manager	975-4295
Indian and Northern Affairs Canada, Baffin Sub-District	975-4295
Environment and Climate Change Canada, Iqaluit	975-4636
Department of Fisheries and Oceans, Iqaluit	979-8000
Regional Public Health Officer, Government of Nunavut	979-7652



## 1.0 INTRODUCTION

The purpose of this spill contingency plan is to outline a formal practical response system which can be implemented immediately in the event of a deleterious material, such as sewage or fuels, being spilled to the natural environment. **The scope of the document includes spills resulting from activities carried out by the City of Iqaluit or from the failure of a system component in the City's infrastructure only.** This plan is intended to promote the safe handling of potentially hazardous materials to minimize health hazards, environmental damage and clean up costs. The plan is written so it can be easily understood and be reasonably comprehensive in providing access to all information required for handling a spill.

It is the City's policy to:

- i. Comply with existing regulations;
- ii. Provide such protection of the environment as is technically and economically feasible;
- iii. Take appropriate action with the necessary resources to remedy a spill situation as soon as it becomes evident;
- iv. Cooperate with other groups to protect the environment;
- v. Ensure an on-going preventative maintenance program is implemented for all City facilities and to upgrade infrastructure when appropriate; and
- vi. Keep employees, government officials and the public informed.

Included with this plan is a one page "If You Discover a Spill" response sheet that is intended to be carried in City vehicles and posted in municipal work areas. In an emergency situation, prompt action is important and quick access to a response checklist may reduce the seriousness of a spill.

A sites plan has been included in **Appendix A** showing the existing layout of all buildings and waste handling/disposal facilities in the City.

This 2016 version of the Spill Contingency Plan has incorporated all information from the following documents:

1. City of Iqaluit Spill Contingency Plan, Dillon Consulting Limited, 2004.
2. City of Iqaluit Sewage Life Station Spill Contingency Plan, Dillon Consulting Limited, 2003.
3. City of Iqaluit Sewage Lagoon Preparedness Plan, Dillon Consulting Limited, 2003.



## 2.0 REPORTING PROCEDURES

City of Iqaluit employees have access to mobile radios and key personnel can be reached through dispatch by pager on a 24-hour basis. The dispatch number is monitored 24 hours per day.

**All spills that are determined to be the responsibility of the City and only these spills are reported to the dispatch number.**

All spills exceeding reportable quantities are to be reported immediately to the NWT 24-hour Spill Report Line. Spill Report Line personnel will provide direction and will ensure that an investigation is undertaken by the appropriate government authority. Appendix C contains a listing of material and the quantities that are reportable in the event of a spill:

Equipment may be dispatched for City spill clean-up by the Director of Public Works & Engineering only.

The 24-Hour Spill Line is currently being run by the GNWT-Resources, Wildlife and Economic Development division. Callers to the spill line will be provided with expert advice regarding hazardous materials spills. The personnel at the spill line will also ensure that the government agencies with jurisdiction over the spill are contacted.

The effectiveness of this spill contingency plan will greatly depend upon the following factors:

- The proper distribution of the plan to those personnel most likely to encounter a spill or release of deleterious substance during the course of their normal work,
- Training of these same personnel as to the objectives and contents of this plan and how they should react upon encountering a spill or system failure that may result in a subsequent release of deleterious substances,
- Training of the response personnel as to what steps they are required to take in the event of the plan being put into action.

### 2.1 Spill Finder's (First Responder) Response

In most cases, the first responder will be trained on-call personnel experienced in assessing the situation and proceeding in accordance with the strategy as outlined below.

- a. Be alert and consider your personal safety first,
- b. Assess the hazard to persons in the vicinity of the spill and where possible take action to control danger to human life. If possible, identify the material or products involved in this particular incident,
- c. If the spill creates a fire, explosion or other hazard to human life, remove all potential ignition sources, if possible, evacuate the area, contact the RCMP,
- d. If safe and practical try to take appropriate action to stop the release of material,
- e. Contact Dispatch and report the spill,
- f. Contact the Utility Foreman and report the spill,
- g. Mark the spill scene to warn the public and prevent access.

## **2.2 Director of Public Works & Engineering Response**

Once notified by the Fire Department or Dispatch, the Director of Public Works & Engineering shall:

- a. Proceed to the spill location.
- b. Liaise with the Fire Chief.

The Fire Chief and Director of Public Works & Engineering are then responsible to ensure the following steps are carried out:

- a. Make the necessary arrangements for first aid and removal of injured personnel. Take the necessary action, where possible, to secure the site to protect human safety.
- b. If not already done and if it is safe to do so, take the appropriate action to stop the flow or release of material. If at all possible take the necessary action to contain or prevent the spread of the spilled material,
- c. Gather information on the status of the situation,
- d. Fill out as completely as possible, a spill report form (attached) and then contact the 24 Hour Spill Line,
- e. If required, contact the CAO.

The Director of Public Works & Engineering will be the overall municipal coordinator for any spill response action, and as such the Director will:

- Work in conjunction with the lead agency to coordinate clean up personnel,
- Be responsible for evaluating the initial situation and assessing the magnitude of the problem,
- Activate the response plan and call out the key personnel in the response team, as deemed appropriate, to meet the situation.
- Assist in developing the overall plan of action for containment and clean up of the specific incident and delegate the responsibility for implementing the plan,
- Ensure that the assigned responsibilities are carried out and that coordination exists between supervisory team members,
- Assess the requirements for personnel, equipment, materials and tools to contain the spill in light of what resources are immediately available. The urgency will depend on the nature and magnitude of the spill.

Additionally, it will be the Director of Public Works & Engineering responsibility to ensure that all City spill response personnel receive adequate training in order to fulfill their responsibilities as part of the spill response team.

## **3.0 SITE INFORMATION AND FAILURE PREVENTION**

### **3.1 Sewage Spills**

It is the purpose of this section to outline possible failures of the waste handling/treatment system and the control measures in place to prevent such failures. The location of the lift stations and force main are shown in Figure 1 in Appendix A. Material that is released due to a spill will be collected and disposed of in the sewage lagoon.

#### **3.1.1 Sewage Lift Station**

There are two lift stations currently servicing the sewage system in Iqaluit. Lift Station No. 1 is located by the break water and Lift Station No. 2 is located by the sea lift beach (location of all facilities is shown in Appendix A). In the event of a pump shut down, both sewage lift stations will eventually overflow into Koojesse Inlet. The pumps are electrically powered, and will not operate if there is a power failure. The lift stations are physically checked on a daily basis.

In the event of a pump shutdown, there is approximately 20 minutes storage capacity in the wet wells before the sewage will overflow. Each lift station is equipped with fluid high level alarms that trigger auto dialers which contact the 20 Hour Dispatch number. Sewage trucks are dispatched to manually pump out the wet wells. The lift stations are equipped with diesel powered pumps and piping that may be connected for manual operation during power outages.

Upon shut down, all sewage lift stations will eventually overflow to a designated low lying area or body of water to prevent a public health hazard through contact with raw sewage. The following is a list of the lift stations and the body of water or lift station that will receive sewage overflows:

- Liftstation No. 1: Koojesse Inlet
- Liftstation No. 2: Koojesse Inlet

Each lift station has the following main components:

- A wet-well that receives the raw sewage.
- Two self-priming centrifugal pumps.
- Float levels in the wet-well that control the pumps
- Monitoring for high level of sewage in the wet-wells.
- Building low temperature alarms.
- Motor starters, domestic electrical (lighting) and electric heat.
- Alarms result in activation of the autodialer that will notify Town Dispatch of the alarm at the lift station.

Rating of the lift station pumps are as follows;

	<b>Sewage Lift Station 1</b>	<b>Sewage Lift Station 2</b>
<b>Manufacturer</b>	Gorman Rupp	Gorman Rupp
<b>Model</b>	T6A3S – B	T3A3S – B
<b>Size</b>	150 mm	75 mm
<b>Impeller Diameter</b>	314.3 mm	215.9 mm
<b>RPM</b>	1770	1160
<b>Motor</b>	30 HP	5 HP
<b>Design Discharge</b>	44 l/s	12.6 l/s
<b>Head</b>	17.7 m	11.6 m

All lift stations are checked once per day, 7 days per week. Daily records are kept on the status of the lift stations.

### 3.1.2 Sewage Force Main

The sewage force main is routed entirely beneath the ground surface and is not monitored.

### 3.1.3 Sewage Lagoon

The sewage lagoon is located at the head of Koojesse Inlet on the southwest side of the Municipality.

The Iqaluit sewage lagoon was originally constructed in 1978 by erecting two dykes stretching from the northwestern shoreline to a nearby island in Koojesse Inlet. The lagoon covered an area of approximately 17,000 m<sup>2</sup> with a retention volume of 32,000 m<sup>3</sup>. The lagoon was reconstructed in 1991, and the retention volume was reduced to a maximum of 25,000 m<sup>3</sup>. At the current sewage production rate of 1,800 m<sup>3</sup>/day, retention times vary between 6.7 and 13.8 days.

Sewage is transferred to the lagoon by truck and through the force main by gravity flow. The inlet is located on the north side of the lagoon. Outflow from the lagoon is primarily through the west dyke, which was designed to be “leaky”. Seepage through the dyke provides some level of solids removal. The effluent discharges directly into Koojesse Inlet.

The majority of the discharge occurs, as intended, through the west dyke as it is at a lower elevation than the east dyke. Seeps have appeared on the west dyke on two separate occasions, prompting concern regarding the structural integrity of the dyke. The lagoon has an operation detention volume of between 12,000 m<sup>3</sup> and 25,000 m<sup>3</sup> at operating water levels of 0.7 m to 1.5 m. Sewage enters the lagoon at a rate of approximately 1,800 m<sup>3</sup>/day.

In the event of dyke failure, sewage will drain directly into Koojesse Inlet.

### **3.2 Fuel and Gasoline Storage**

Diesel fuel and gasoline is stored in above ground self-contained tanks at the main municipal garage. Diesel is kept in a 20,000L tank and gasoline is kept in a 4,500L tank. Spill clean-up material at the garage consists of “Absorball” pellets which are taken to the landfill and burned after use.

A 2,000L above ground self contained tank is located adjacent to the water treatment plant. It is used to store heating fuel.

The fuel storage tanks are not located near areas considered to be environmentally sensitive.

### **3.3 Chlorine Gas**

Chlorine gas is stored at the water treatment plant. Two Class ‘A’ response suites, 2 Scott pack and personal chlorine detectors are stored at this location. A fixed chlorine detector is also mounted in the storage area.

### **3.4 Calcium Chloride**

Calcium chloride for use on the roads is stored in Tyvex bags at the main garage.

### **3.5 Glycol**

Glycol in 45 gallon drums is stored at the main garage. There are generally no more than 10 drums present at any given time.

### **3.6 Hydrofluosilicic Acid**

Hydrofluosilicic acid for fluoridating the City water supply is stored at the water treatment plant.

### **3.7 Lime**

A maximum of 150 – 25lb bags of lime are stored at the water treatment center for use in controlling the pH of the municipal water supply.

### **3.8 Sodium Hypochlorite, 12%**

Up to 12-20L containers of sodium hypochlorite are stored at the entrance to the water treatment plant.

### **3.9 Propane**

Two 40lb propane cylinders, used to fuel the Zamboni, are stored in the Zamboni room at the arena.

### **3.10 Sodium Hydroxide Solution**

(Caustic Soda 50%) is stored at the water treatment plant.

### **3.11 Carus UPZ 985**

(Zinc Ortho Phosphate) is stored at the water treatment plant.

## **4.0 SYSTEM COMPONENT FAILURE PREVENTION**

### **4.1 Sewage Lift Station**

Should a spill become apparent at either Lift station, the Utility Foreman would:

- Ensure public safety at all times and if required, notify Dispatch and the Fire Department.
- Contact the 24-Hour Spill Report Line
- Mobilize staff to determine the cause of the problem, whether in the lift station or dump station and repair if possible with staff and outside resources, where required.
- Contact the Operations Superintendent or Trucked Services Foreman to request sewage pumper trucks and mobilize the City's equipment as well. Sewage would be taken from the wet well and hauled to the lagoon.
- Mobilize equipment, including loaders, backhoes and dump trucks, to construct a temporary berm to prevent sewage from entering Koojesse Inlet.
- Clean up contaminated areas and haul material to the lagoon for disposal.

A similar response would be undertaken with other lift stations with the exception of berm construction which is site specific.

The City has had to respond to lift station sewage overflows in the past. The response team and measures taken to date have proven effective. The City seeks to improve its contingency planning with input from the regulating authorities and other parties.

### **4.2 Sewage Force Main**

The sewage force main is completely buried and is not monitored.

### **4.3 Sewage Lagoon**

Under normal conditions, the lagoon is monitored seven days per week. The lagoon level is checked and the dykes are inspected for leaks. If problems are suspected with the lagoon, the monitoring frequency will increase.

### **4.4 Chlorine Gas Storage**

A fixed chlorine gas detector is installed in the chlorine gas storage room.

## 5.0 RESPONSE TEAM, ACTION AND EQUIPMENT

Key personnel have been identified for emergency spill response. They are identified below with their key role in the event of a spill:

<b>Director of Public Works &amp; Engineering</b>	Personnel, Loaders and Trucks
<b>Chief Administrative Officer</b>	Media
<b>Fire Chief</b>	Trucks, Fire Retardant Foam and Emergency Measures Organizations

- The Director of Public Works & Engineering and the Fire Chief work together to coordinate the mobilization of men and equipment as required to contain the spill.
- The Chief Administrative Officer is in charge of coordinating the information and messages flow to the media.
- The Fire Chief will provide personnel and equipment to assist in a spill response action. If the situation is deemed to require it, the Fire Chief will call out the Emergency Measures Organization (EMO).

The following details the response to be taken in case of a spill or leak at the locations outlined in section 3:

### 5.1 Sewage Spills

Should a sewage spill become apparent, the Director of Public Works & Engineering would be responsible to:

- Ensure the public safety at all times and if required, notify the Fire Department and CAO,
- Contact the NWT 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem, and act to stop the release of the sewage,
- Mobilize equipment as required to contain the spill through trenching, berming, etc. to prevent sewage from entering Koojesse Inlet,
- Clean up contaminated areas with suction trucks, loaders, dump trucks and absorbent materials as required.

### 5.2 Sewage Lagoon

In the event of a dyke breach, essentially raw sewage will be discharged directly into Koojesse Inlet with potentially negative effects on the local fish and shellfish populations. As such, it is important that potential dyke failures be dealt with as quickly as possible. The Director of Public Works & Engineering should be informed immediately if liquid is detected seeping or flowing through the dyke walls.

Upon notification of seepage through the dyke, the Director of Public Works & Engineering should:

- Proceed to the site to evaluate the nature of and extent of the problem,

- Contact the 24-hour Spill Report Line,
- Mobilize equipment and manpower as required to contain the sewage and carry our repairs to the dyke.

These actions are more fully outlined in Section 2.2. If possible, any sewage released through the dyke breach should be pumped back into the lagoon.

### **5.3 Fuel and Gasoline Spills**

In the event of a fuel or gasoline spill, the Fire Chief would be contacted by Dispatch and would be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works & Engineering and the CAO.

The Director of Public Works & Engineering is then responsible to:

- Contact the NWT 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem, and to act to stop the release of the product,
- Mobilize equipment as required to contain the spill through trenching, berming, etc.
- Clean up contaminated areas with hand tools, suction trucks, loaders, dump trucks and absorbent materials as required.

### **5.4 Chlorine Gas Leaks**

In the event of a chlorine gas leak, the Fire Chief would be contacted by dispatch and would be responsible to:

- Ensure the public safety at all times and to notify the Director of Public Works & Engineering and the CAO,

The Director of Public Works & Engineering is then responsible to:

- Contact the 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem and to act to contain the material, if possible to do so in a safe manner, using the available capping tools,
- If the cylinder cannot be capped, arrange for their transport to a safe area and allow the gas to escape,
- Dispose of the faulty cylinders in such a manner as to minimize the risk to human health.

### **5.5 Hydrofluosilicic Acid**

Spills of this material less than 5L will be cleaned up by the Water Treatment Plant Operator using acid neutralizing material. The Water Treatment Plant Operator will notify the Utilidor Foreman of the spill. For spills in excess of 5L, the Water Treatment Plant Operator will

evacuate the immediate area and notify Dispatch. Dispatch will contact the Fire Department. The Fire Chief will then be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works & Engineering and the CAO,

Upon notification by the Fire Chief or Dispatch, the Director of Public Works & Engineering will be responsible to:

- Contact the 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem and act to contain the material if possible to do so in a safe manner,
- Dispose of the neutralized material according to GNWT regulations.

## **5.6 Sodium Hypochlorite**

Spills of this material less than 5L will be cleaned up by the Water Treatment Plant Operator using appropriate neutralizing material. The Water Treatment Plant Operator will notify the Utilidor Foreman of the spill. For spills in excess of 5L, the Water Treatment Plant Operator will evacuate the immediate area and notify Dispatch. Dispatch will contact the Fire Department. The Fire Chief will then be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works & Engineering and the CAO.

Upon notification by the Fire Chief or the Dispatch, the Director of Public Works & Engineering will be responsible to:

- Contact the 24-hour Spill Report Line,
- Mobilize staff to determine the cause of the problem and act to contain the material if possible to do so in a safe manner,
- Dispose of the neutralized material according to GNWT regulations.

## **6.0 GENERAL SPILLS**

The following sections provide general information on the handling of large volume spills to a variety of receptors. In Iqaluit, sewage and petroleum products are stored in sufficient quantities that a large volume spill could occur.

### **6.1 Sewage Spills**

#### **6.1.1 Containment on Land**

Containment of large volume sewage spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. The location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

#### **6.1.2 Containment on Surface Water**

As sewage will readily mix with water it may prove impossible to contain the spill once water is reached. Strong action should be taken to prevent the material from entering a water body and to stop the material discharge at the source. Care should be taken to ensure public health and safety (eg. Protect water intakes, etc.) and the long term environmental effects of the spill should be monitored.

If the water is flowing through a drainage ditch or smaller stream, a channel should be constructed to divert the water flow around the spill area. A dam should be constructed to contain the water the sewage has already entered.

#### **6.1.3 Containment on Ice**

Containment of spills on ice will be affected by the load bearing strength of the ice. If it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dykes should be lined with plastic to make it impermeable to the sewage. Water may be sprayed on snow dams/dykes to form a impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

#### **6.1.4 Containment on Snow**

Snow will readily absorb liquids, which may facilitate the removal of spilled material to a recovery or disposal site. Saturated contaminated snow may be collected relatively easily and hauled away. Compacted snow can be used to create an effective physical barrier to reduce the spread of spilled materials.

Several types of snow containment structures may be constructed to contain spilled materials. Snow dykes and dams can be erected and then lined with an impermeable liner or sprayed with water to form an impermeable ice layer. Initially the snow around the perimeter of the spill can be compacted, eg. With a snowmobile, to slow the movement of contaminants. The saturated snow can be collected with hand tools or heavy equipment and removed to the sewage lagoon for disposal.

Caution should be exercised as spilled materials can migrate under snow cover for considerable distances and not be visible from above.

### **6.1.5 Material Removal**

Removal of the spilled sewage may be accomplished using several techniques depending on the nature of the spill. Generally, methods used include suction, mechanical removal and the application of absorbent material.

Suction methods may be used initially if there is a significant quantity of free product on the ground. Equipment used to recover material in this fashion may include vacuum trucks, portable pumps or shop vacuums.

Suction screens may be required to prevent hose plugging and possible pump drainage.

Mechanical recovery using hand tools or heavy equipment should be used to collect soils or other loose material contaminated by the sewage. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause a greater environmental impact from the operation of the equipment than from the spill itself.

Recovered liquids and saturated soils will be disposed of in the sewage lagoon.

## **6.2 Fuel and Gasoline Spills**

**Extreme caution should be exercised when containing and cleaning up spilled petroleum products due to high fire and explosion hazards associated with these materials.**

Depending on the size of the spill and surrounding conditions, personal protective equipment such as rubber gloves (nitrile, neoprene, butyl rubber or PVC), rubber boots (neoprene or butyl rubber), chemical safety goggles and NIOSH/MSHA approved half mask respirators with organic vapor cartridges may be required. In poorly ventilated areas where there is the potential for vapors to concentrate, the use of heavy equipment should be carefully evaluated due to the potential explosion hazard.

### **6.2.1 Containment on Land**

Containment of large volume fuel spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of the material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. This location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

### **6.2.2 Containment on Surface Water**

As diesel fuels and gasoline are less dense than water, they will float on the surface. Spills of these materials to surface water bodies may be contained using booms and their floating devices.

In standing water, booms should be deployed to contain the floating material close to the shore, thereby facilitating contaminant recovery. If the water is flowing, the booms should be stretched across the width of the water surface and angled against the current to allow for shore side collection.

If the water is flowing through a drainage ditch or smaller stream, an underpass or water bypass dam should be constructed. An earthen dam is constructed to completely stop the flow of water. Piping is then installed to allow water to flow through below the level of the floating fuel. Alternately, a channel may be constructed to divert the water flow around the spill area. A dam should be constructed to contain the water the fuel has already entered.

Weirs constructed of sheet metal, plywood, etc. may be constructed to prevent material flow through culverts or ditches. The sheet is inserted into the stream to below the level of the fuel. The water flows under the weir and spilled material will collect at the surface for removal.

If commercial booms are not readily available, improvising booms can be constructed of virtually any material that will float and form a barrier, eg. logs, inflated fire hoses, etc. These materials may be used alone or, preferably, as supports for absorbent materials.

### **6.2.3 Containment on or Under Ice**

Containment of spills on ice will be affected by the load bearing strength of the ice. If it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dyke should be lined with plastic to make it impermeable to the fuel. Water may be sprayed on snow dams/dykes to form an impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

If the spill penetrates the ice, containment becomes more difficult. If the water beneath the ice is standing, the ice will be broken to install a containment boom.

If the water is flowing slowly, ice slotting may be used. A trench is cut into the ice downstream of the spill and at an angle to the current to deflect and concentrate the spill. Spilled material that collects in the ice slot may be pumped out, absorbed or burned in place.

Vertical barriers, e.g. plywood sheets, may be inserted into the ice to deflect the movement of spilled material. Trenches should be cut in the ice at an angle to the direction of flow. The vertical barriers are inserted in the slots and allowed to freeze into place. The extent of the under ice spill may be monitored by boring observation holes into the ice with an auger.

#### **6.2.4 Containment on Snow**

Snow will readily absorb liquids, which may facilitate the removal of spilled material to a recovery or disposal site. Saturated contaminated snow may be collected relatively easily and hauled away. Compacted snow can be used to create an effective physical barrier to reduce the spread of spilled materials.

Several types of snow containment structures may be constructed to contain spilled material. Snow dykes and dams can be constructed and then lined with an impermeable liner or sprayed with water to form an impermeable ice layer. Initially the snow around the perimeter of the spill can be compacted, eg. with a snowmobile, to slow the movement of contaminants. The saturated snow can be collected with hand tools or heavy equipment and removed to the land fill for disposal or recovery.

Caution should be exercised as spilled material can migrate under snow cover for considerable distances and cannot be visible from above.

#### **6.2.5 Fire or Explosion**

The first step to be taken at a site where there is a fire or explosion risk, or if the material is on fire is to evacuate people from the surrounding area. Dykes or trenches are then constructed down slope of the spilled material to minimize spread of unburned liquids and/or the fire. The fire may then be extinguished using suitable methods and action may be taken to prevent further spillage, contain the material and begin clean-up procedures.

#### **6.2.6 Material Removal**

Removal of the spilled fuels may be accomplished using several techniques. Generally, methods used include suction, mechanical removal and the application of absorbent material.

Suction methods may be used initially if there is a significant quantity of free product on the ground or on the surface of a water body. Equipment used to recover material in this fashion may include vacuum trucks, portable pumps or shop vacuums.

Suction screens may be required to prevent hose plugging and possible dump damage.

Mechanical recovery using hand tools or heavy equipment should be used to collect soils or other loose material contaminated by the fuel. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause a greater environmental impact from the operation of the equipment than from the material itself.

Absorbents may be used to soak up petroleum product. They are commonly used for final clean-up, recovery of small amounts of fuel or to remove fuel from places which are inaccessible to other spill clean up methods. Snow and soil can be used as absorbent



material for a variety of petroleum products. The saturated absorbent can be collected mechanically and moved to a suitable disposal location.

Recovered liquids will be disposed of in accordance with appropriate GNWT regulations. Saturated soils and absorbents will be transported to the landfill for disposal

## **6.3 Chlorine Gas Leak**

**Chlorine is a very toxic gas. Appropriate personal safety equipment must be worn by personnel attempting to contain a leak. Two Class A response suites with Scott packs are located at the Fire Department for use in the event of a leak.**

### **6.3.1 Containment and Disposal**

Capping tools are available for sealing leaking cylinders. If a cylinder is capped successfully, it may be returned to the supplier for disposal. If the cylinder cannot be capped, remove the cylinder to a safe location downwind of any populated area and allow the gas to escape.

## 7.0 SPILL EQUIPMENT INVENTORY

### 7.1 Spill Equipment

The following is a listing of equipment owned by the City of Iqaluit that may be used in the event of a spill emergency. The usual location of the equipment is also indicated.

<b>MUNICIPAL SPILL EMERGENCY EQUIPMENT</b>	
<b>EQUIPMENT</b>	<b>STORAGE LOCATION</b>
5 Cat 950 Loaders	5 at the Municipal Garage
2 Rubber Tired Backhoe	2 at the Municipal Garage (outside)
2 Dump Trucks	2 at the Apex Parking Garage (winter) 2 at the Municipal Garage (non-winter)
1 Cat 814 Wheel Dozer	Municipal Garage (outside) / Air Base Garage (winter)
2 Road Graders	1 at Air Base Garage 1 at the Apex Parking Garage
1 Cat M322 Excavator with hammer	1 at the Municipal Garage (outside)
4 Sewage Trucks	4 at the Airbase Parking Garage
5 Water Trucks	1 at the Airbase Parking Garage 4 at the Apex Parking Garage
1 Cat 966 Loader	1 at the Municipal Garage

### 7.2 Resource Contact

The following is a listing of internal and external resources that may be contacted for aid in the event of a spill:

<b>CONTACT</b>	<b>RESOURCE PROVIDED</b>
Fire Department: Volunteers	Manpower, Trucks, Foam
Fire Department: Ambulance	Medical, Rescue Equipment
Fire Department: EMO	Evacuation, Rescue
24-Hour Spill Report Line	Expert Advice
External Contractors	Manpower, Equipment



## **8.0 TRAINING EXERCISES**

Training and communication exercises should be carried on an annual basis to determine the actual readiness and ability of the City to handle a spill emergency. The exercises should be served to train key personnel and determine any weaknesses in the plan prior to the occurrence of an emergency situation. A variety of scenarios should be tested, eg. sewage spills from the force main, sewage lagoon dam failures, chlorine gas leaks, fuel spills, etc. to ensure that appropriate action can be taken quickly. The Fire Department and the Emergency Measures Organization (EMO) currently conduct disaster training exercises in the City of Iqaluit. Neither of these groups target hazardous materials scenarios specifically, but a spill situation is often included as part of the larger exercise. The Worker's Compensation Board will provide funding for employees to participate in hazardous materials courses if contact with hazardous materials is a component of the employee's job description. Courses available include Materials Safety Data Sheets (MSDS), Workplace Hazardous Materials Systems (WHMIS) and First Aid.



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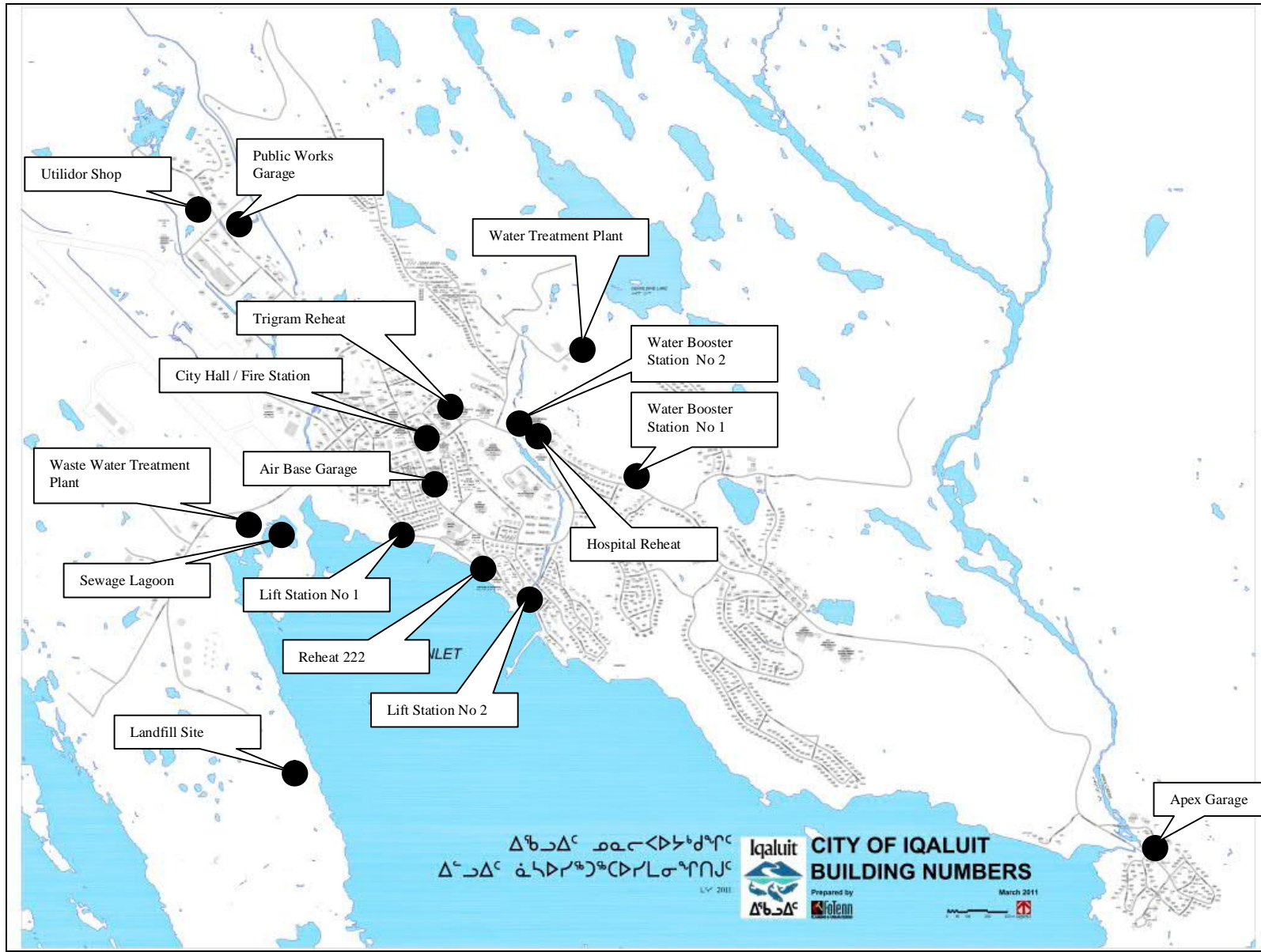
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# **APPENDIX A**

## **CITY OF IQALUIT SITE PLAN**



**APPENDIX B**

**MATERIALS AND  
REPORTABLE QUANTITIES LIST  
(SAFETY DATA SHEETS)**

**SCHEDULE B***(Section 9)*

<b>ITEM NO.</b>	<b>TDGA CLASS</b>	<b>DESCRIPTION OF CONTAMINANT</b>	<b>AMOUNT SPILLED</b>
1	1	Explosives	Any Amount
2	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 lt.
3	2.2	Compressed gas (non-corrosive, non flammable)	Any amount of gas from containers with a capacity greater than 100 lt.
4	2.3	Compressed gas (toxic)	Any amount
5	2.4	Compressed gas (corrosive)	Any Amount
6	3.1, 3.2, 3.3	Flammable Liquid	100 lt.
7	4.1	Flammable solid	25 kg
8	4.2	Spontaneously combustible solids	25 kg
9	4.3	Water reactant solids	25 kg
10	5.1	Oxidizing substances	50 lt. or 50 kg
11	5.2	Organic Peroxides	1 lt. or 1 kg
12	6.1	Poisonous substances	5 lt. or 5 kg
13	6.2	Infectious substances	Any amount
14	7	Radioactive	Any amount
15	8	Corrosive Substances	5 lt. or 5 kg
16	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 lt. or 50 kg.
17	9.2	Environmentally hazardous	1 lt. or 1 kg
18	9.3	Dangerous wastes	5 lt. or 5 kg
19	9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 lt. or 0.5 kg
20	None	Other contaminants	100 lt. or 100 kg

## **APPENDIX C**

### **SEWAGE LIFT STATION – PUMP DATA**



	<b>Sewage Lift Station 1</b>	<b>Sewage Lift Station 2</b>
<b>Manufacturer</b>	Gorman Rupp	Gorman Rupp
<b>Model</b>	T6A3S – B	T3A3S – B
<b>Size</b>	150 mm	75 mm
<b>Impeller Diameter</b>	314.3 mm	215.9 mm
<b>RPM</b>	1770	1160
<b>Motor</b>	30 HP	5 HP
<b>Design Discharge</b>	44 l/s	12.6 l/s
<b>Head</b>	17.7 m	11.6 m

## **APPENDIX D**

# **SPILL REPORT FORMS**





**City of Iqaluit**

***Spill Contingency Plan***

**Updated: March 2007**

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## 1.0 INTRODUCTION

The purpose of this spill contingency plan is to outline a formal practical response system which can be implemented immediately in the event of a deleterious material, such as sewage or fuels, being spilled to the natural environment. **The scope of the document includes spills resulting from activities carried out by the City of Iqaluit or from the failure of a system component in the City's infrastructure only.** This plan is intended to promote the safe handling of potentially hazardous materials to minimize health hazards, environmental damage and clean up costs. The plan is written so it can be easily understood and be reasonably comprehensive in providing access to all information required for handling a spill.

Included with this plan is a one page "If You Discover a Spill" response sheet that is intended to be carried in City vehicles and posted in municipal work areas. In an emergency situation, prompt action is important and quick access to a response checklist may reduce the seriousness of a spill.

A sites plan has been included in Appendix A showing the existing layout of all buildings and waste handling/disposal facilities in the City.

## 2.0 REPORTING PROCEDURES

City of Iqaluit employees have access to mobile radios and key personnel can be reached through dispatch by pager on a 24-hour basis. The dispatch number is monitored 24 hours a day. **All spills are determined to be the responsibility of the City and only these spills are reported to the dispatch number.**

All spills exceeding reportable quantities are to be reported immediately to the NWT 24-hour Spill Report Line (867) 920-8130. Spill Report Line personnel will provide direction and will ensure that an investigation is undertaken by the appropriate government authority. Appendix C contains a listing of material and the quantities that are reportable in the event of a spill:

The following are contact numbers for municipal response personnel:

CITY OF IQALUIT			
CONTACT	PAGER #	WORK #	CELL #
Dispatch	NA	979-5680	
Chief Administrative Officer (CAO)	N/A	979-5666	
Director of Public Works	N/A	975-8501	975-1877
Operations Superintendent, Public Works	N/A	979-5653	975-1774
Director of Engineering	N/A	975-8502	975-1780
Fire Chief	45	979-5657	975-1446
Chief By-Law	N/A	979-5670	975-1930
Utilidor Foreman	32	979-5648	975-1443
Garage/Roads Foreman	12	979-5638	975-1463
Truck Sewer Water Foreman	N/A	979-5612	975-1473

Equipment may be dispatched for City spill clean-up by the Director of Public Works only. As and when contracts are negotiated on a yearly basis with local contractors to provide equipment and manpower to the City of Iqaluit. See Appendix G for a list of current as and when Contracts.

The 24-Hour Spill Line is currently being run by the GWNT – Resources, Wildlife and Economic Development division. Callers to the spill line will be provided with expert advice regarding hazardous materials spills. The personnel at the spill line will also ensure that the government agencies with jurisdiction over the spill are contacted.

EXTERNAL ASSISTANCE – GOVERNMENT RESOURCES	
AGENCY	TELEPHONE #
24-Hour Spill Line	(867) 920-8130

The effectiveness of this spill contingency plan will greatly depend upon the following factors:

- The proper distribution of the plan to those personnel most likely to encounter a spill or release of deleterious substance during the course of their normal work.
- Training of these same personnel as to the objectives and contents of this plan and how they should react upon encountering a spill or system failure that may result in a subsequent release of deleterious substances.
- Training of the response personnel as to what steps they are to take in the event of the plan being put into action.

### 2.1 Spill Finder's Response

- a. Be alert and consider your personal safety first.
- b. Assess the hazard to persons in the vicinity of the spill and where possible take action to control danger to human life. If possible, identify the material or products involved in this particular incident.

- c. If the spill creates a fire, explosion or other hazard to human life, remove all potential ignition sources, if possible, evacuate the area, contact the RCMP.
- d. If safe and practical try to take appropriate action to stop the release of material
- e. Contact Dispatch and report the spill.
- f. Mark the spill scene to warn the public and prevent access.

## **2.2 Director of Public Works Response**

Once notified by the Fire Department or Dispatch, the Director of Public Works shall:

- a. Proceed to the spill location.
- b. Liaise with the Fire Chief.

The Fire Chief and Director of Public works are then responsible to ensure the following steps are carried out:

- a. Make the necessary arrangements for first aid and removal of injured personnel. Take the necessary action, where possible, to secure the site to protect human safety.
- b. If not already done and if it is safe to do so take the appropriate action to stop the flow or release of material. If at all possible take the necessary action to contain or prevent the spread of the spilled material.
- c. Gather information on the status of the situation.
- d. Fill out as completely as possible, a spill report form (attached) and then contact the 24-Hour Spill Line at (867) 920-8130.
- e. If required, contact the CAO.

The Director of Public Works will be the overall municipal coordinator for any spill response action and as such he will:

- Work in conjunction with the lead agency to coordinate clean up personnel.
- Be responsible for evaluating the initial situation and assessing the magnitude of the problem.
- Activate the response plan and call out the key personnel in the response team, as deemed appropriate to meet the situation.
- Assist in developing the overall plan of action for containment and clean up of the specific incident and delegate the responsibility for implementing the plan.
- Ensure that the assigned responsibilities are carried out and that coordination exists between supervisory team members.
- Assess the requirements for men, equipment, materials and tools to contain the spill in light of what resources are immediately available. The urgency will depend on the nature and magnitude of the spill

Additionally it will be the Director of Public Works responsibility to ensure that all City spill response personnel receive adequate training in order to fulfill their responsibilities as part of the spill response team.

### **3.0 SITE INFORMATION AND FAILURE PREVENTION**

#### **3.1 Sewage Spills**

It is the purpose of this section to outline possible failures of the waste handling/treatment system and the control measures in place to prevent such failures. The location of the lift stations and force main are shown in Figure 1 in Appendix A. Material that is released due to a spill will be collected and disposed of in the sewage lagoon.

##### **3.1.1 Sewage Lift Station**

There are two lift stations currently servicing the sewage system in Iqaluit. Lift Station No. 1 is located by the break water and Lift Station No. 2 is located by the sea lift beach. In the event of a pump shut down, both sewage lift stations will overflow into Koojesse Inlet. The pumps are electrically powered and will not operate if there is a power failure.

In the event of a pump shutdown, there is approximately 20 minutes storage capacity in the wet wells before the sewage will overflow. Each lift station is equipped with fluid high level alarms that trigger auto dialers which contact the 20 Hour Dispatch number. Sewage trucks are dispatched to manually pump out the wet wells. The lift stations are equipped with diesel powered pumps and piping that may be connected for manual operation during power outages.

The lift stations are physically checked on a daily basis.

##### **3.1.2 Sewage Force main**

The sewage force main is routed entirely beneath the ground surface and is not monitored.

##### **3.1.3 Sewage Lagoon**

The sewage lagoon is located at the head of Koojesse Inlet on the southwest side of the Municipality. Sewage is conducted to the lagoon by truck and through the force main. The inlet is located on the north side of the lagoon. Outflow from the lagoon is primarily through the west dyke, which was designed to be "leaky". Seepage through the dyke provides some level of solids removal. The effluent discharges directly into Koojesse Inlet.

#### **3.2 Fuel and Gasoline Storage**

Diesel fuel and gasoline is stored in aboveground self-contained tanks at the main municipal garage. Diesel is kept in a 20,000L tank and gasoline is kept in a 4,500L tank. Spill clean-up material at the garage consists of "Absorbant" pellets which are taken to the landfill and burned after use.

A 2,000L above ground self contained tank is located adjacent to the water treatment plant. It is used to store heating fuel.

The fuel storage tanks are not located near areas that are considered environmentally sensitive.

#### **3.3. Chlorine Gas**

Chlorine gas is stored at the water treatment plant. Two class A response suites, 2 Scott pack and personal chlorine detectors are stored at this location. A fixed chlorine detector is also mounted in the storage area.

#### **3.4 Calcium Chloride**

Calcium chloride for use on the roads is stored in Tyvek bags at the main garage.

#### **3.5 Glycol**

Glycol in 45 gallon drums is stored at the main garage. There are generally no more than 10 drums present at any given time.

### **3.6 Hydorfluosilicic Acid**

Hydrofluosilicic acid for fluoridating the City water supply is stored at the water treatment plant.

### **3.7 Lime**

A maximum of 150 – 25lb bags of lime are stored at the water treatment center for use in controlling the pH of the municipal water supply.

### **3.8 Sodium Hypochlorite, 12%**

Up to 12 -20L containers of sodium hypochlorite are stored at the entrance to the water treatment plan.

### **3.9 Propane**

Two 40lb. propane cylinders, used to fuel the Zamboni, are stored in the Zamboni room at the arena.

### **4.0 Sodium Hydroxide Solution**

(Caustic Soda 50%) is stored at the water treatment plant.

### **4.1 Carus UPZ 985**

(Zinc Ortho Phosphate) is stored a the water treatment plant.

## **4.0 SYSTEM COMPONENT FAILURE PREVENTION**

### **4.1 Sewage Lift Station**

The lift stations are physically checked on a daily basis. The wet are equipped with high fluid level alarms connected to an autodialed which contacts the dispatch number. In he event of pump shutdown, the wet wells approximately 20 minutes worth of storage capacity before they overflow.

Diesel pumps and piping are located in the stations, and may be installed for emergency operations when the electrical pumps are down. Sewage trucks are on call and may be mobilized by Dispatch in case of pump shutdown.

### **4.2 Sewage Force Main**

The sewage force main is completely buried and is not monitored.

### **4.3 Sewage Lagoon**

The sewage lagoon is routinely checked seven days per week for levels and leaks. If problems are suspected, the frequency of monitoring would increase.

### **4.4 Chlorine Gas Storage**

A fixed chlorine gas detector is installed in the chlorine gas storage room.

## 5.0 RESPONSE TEAM, ACTION AND EQUIPMENT

Key personnel have been identified for emergency spill response. They are identified below with their key role in the event of a spill:

Director of Public Works	-	Manpower, Loaders and Trucks
Chief Administrative Officer-		Media
Fire Chief	-	Trucks, Fire Retardant Foam and Emergency Measures Organizations

The Director of Public Works and the Fire Chief work together to coordinate the mobilization of men and equipment as required to contain the spill. The Chief Administrative Officer is in charge of coordinating the information and messages flow to the media. The Fire Chief will provide men and equipment to assist in a spill response action. If the situation is deemed to require it, the Fire Chief will call out the Emergency Measures Organization (EMO).

The following details the response to be taken in case of a spill or leak at the locations outlined in section 3.

### 5.1 Sewage Spills

Should a sewage spill become apparent, the Director of Public Works would be responsible to:

- Ensure the public safety at all times and if required, notify the Fire Department and CAO
- Contact the NWT 24-hour Spill Report Line (867) 920-8130
- Mobilize staff to determine the cause of the problem, and act to stop the release of the sewage
- Mobilize equipment as required to contain the spill through trenching, berming, etc. to prevent sewage from entering Koojesse Inlet
- Clean up contaminated areas with suction trucks, loaders, dump trucks and absorbent materials as required.

### 5.2 Fuel and Gasoline Spills

In the event of a fuel or gasoline spill, the Fire Chief would be contacted by Dispatch and would be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works and the CAO.

The Director of Public Works is then responsible to:

- Contact the NWT 24-hour Spill Report Line (867) 920-8130
- Mobilize staff to determine the cause of the problem, and to act to stop the release of the product
- Mobilize equipment as required to contain the spill through trenching, berming, etc.
- Clean up contaminated areas with hand tools, suction trucks, loaders, dump trucks and absorbent materials as required.

### 5.3 Chlorine Gas Leaks

In the event of a chlorine gas leak, the Fire Chief would be contacted by dispatch and would be responsible to:

- Ensure the public safety at all times and to notify the Director of Public Works and the CAO

The Director of Public Works is then responsible to:

- Contact the 24-hour Spill Report Line (867) 920-8130
- Mobilize staff to determine the cause of the problem and to act to contain the material, if possible to do so in a safe manner, using the available capping tools
- If the cylinder cannot be capped, arrange for their transport to a safe area and allow the gas to escape.
- Dispose of the faulty cylinders in such a manner as to minimize the risk to human health

### 5.4 Hydrofluosilicic Acid

Spills of this material less than 5L will be cleaned up by the Water Treatment Plant Operator using acid neutralizing material. The Water Treatment Plant Operator will notify the Utilidor Foreman of the spill. For spills in excess of 5L, the Water Treatment Plant Operator will evacuate the immediate area and notify Dispatch. Dispatch will contact the Fire Department. The Fire Chief will then be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works and the CAO

Upon notification by the Fire Chief or Dispatch, the Director of Public Works will be responsible to:

- Contact the 24-hour Spill Report Line (867) 920-8130
- Mobilize staff to determine the cause of the problem and act to contain the material if possible to do so in a safe manner.
- Dispose of the neutralized material according to GNWT regulations.

## **5.5 Sodium Hypochlorite**

Spills of this material less than 5L will be cleaned up by the Water Treatment Plant Operator using appropriate neutralizing material. The Water Treatment Plant Operator will notify the Utilidor Foreman of the spill. For spills in excess of 5L, the Water Treatment Plant Operator will evacuate the immediate area and notify Dispatch. Dispatch will contact the Fire Department. The Fire Chief will then be responsible to:

- Ensure the public safety at all times and notify the Director of Public Works and the CAO

Upon notification by the Fire Chief or the Dispatch, the Director of Public Works will be responsible to:

- Contact the 24-hour Spill Report Line (867) 920-8130
- Mobilize staff to determine the cause of the problem and act to contain the material if possible to do so in a safe manner.
- Dispose of the neutralized material according to GNWT regulations.

## **6.0 GENERAL SPILLS**

The following sections provide general information on the handling of large volume spills to a variety of receptors. In Iqaluit, sewage and petroleum products are stored in sufficient quantities that a large volume spill could occur.

### **6.1 Sewage Spills**

#### **6.1.1 Containment on Land**

Containment of large volume sewage spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. The location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

#### **6.1.2 Containment on Surface Water**

As sewage will readily mix with water it may prove impossible to contain the spill once water is reached. Strong action should be taken to prevent the material from entering a water body and to stop the material discharge at the

source. Care should be taken to ensure public health safety (eg. Protect water intakes, etc.) and the long term environmental effects of the spill should be monitored.

If the water is flowing through a drainage or smaller stream a channel should be constructed to divert the water flow around the spill area. A dam should be constructed to contain the water the sewage has already entered.

### **6.1.3 Containment on Ice**

Containment of spills on ice will be affected by the load bearing strength of the ice. If it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dykes should be lined with plastic to make it impermeable to the sewage. Water may be sprayed on snow dams/dykes to form a impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

### **6.1.3 Containment on Snow**

Snow will readily absorb liquids which may facilitate the removal of spilled material to a recovery or disposal site. Saturated contaminated snow may be collected relatively easily and hauled away. Compacted snow can be used to create an effective physical barrier to reduce the spread of spilled materials.

Several types of snow containment structures may be constructed to contain spilled materials. Snow dykes and dams can be erected and then lined with an impermeable liner or sprayed with water to form an impermeable ice layer. Initially the snow around the perimeter of the spill can be compacted, eg. With a snowmobile, to slow the movement of contaminants. The saturated snow can be collected with hand tools or heavy equipment and removed to the sewage lagoon for disposal.

Caution should be exercised as spilled materials can migrate under snow cover for considerable distances and not be visible from above.

### **6.1.4 Material Removal**

Removal of the spilled sewage may be accomplished using several techniques depending on the nature of the spill. Generally, methods used include suction mechanical removal and the application of absorbent material.

Suction methods may be used initially if there is a significant quantity of free product on the ground. Equipments used to recover material in this fashion may include vacuum trucks, portable pumps or shop vacuums.

Suction screens may be required to prevent hose plugging and possible pump drainage.

Mechanical recover using hand tools or heavy equipment should be used to collect soils or other loose material contaminated by the sewage. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause a greater environmental impact from the operation of the equipment than from the spill itself.

Recovered liquids and saturated soils will be disposed of in the sewage lagoon.

## **6.2 Fuel and Gasoline Spills**

**Extreme caution should be exercised when containing and cleaning up spilled petroleum products due to high fire and explosion hazards associated with these materials.**

Depending on the size of the spill and surrounding conditions, personal protective equipment such as rubber gloves (nitrile, neoprene, butyl rubber or PVC), rubber boots (neoprene or butyl rubber), chemical safety goggles and NIOSH/MSHA approved half mask respirators with organic vapor cartridges may be required. In poorly ventilated areas where there is the potential for vapors to concentrate, the use of heavy equipment should be carefully evaluated due to the potential explosion hazard.

### **6.2.1 Containment on Land**

Containment of large volume fuel spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of the material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. This location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

### **6.2.2 Containment on Surface Water**

As diesel fuels and gasoline are less dense than water, they will float on the surface. Spills of these materials to surface water bodies may be contained using booms and their floating devices.

In standing water, booms should be deployed to contain the floating material close to the shore, thereby facilitating contaminant recovery. If the water is flowing, the booms should be stretched across the width of the water surface and angled against the current to allow for shore side collection.

If the water is flowing through a drainage ditch or smaller stream, an underpass or water bypass should be constructed. An earthen dam is constructed to completely stop the flow of water. Piping is then installed to allow water to flow through below the level of the floating fuel. Alternately, a channel may be constructed to divert the water flow around the spill area. A dam should be constructed to contain the water the fuel has already entered.

Weirs constructed of sheet metal, plywood, etc., may be constructed to prevent material flow through culverts or ditches. The sheet is inserted into the stream to below the level of the fuel. The water flows under the weir and spilled material will collect at the surface for removal.

If commercial booms are not readily available, improvising booms can be constructed of virtually any material that will float and form a barrier, eg. logs, inflated fire hoses, etc. These materials may be used alone or preferably as supports for absorbent materials.

### **6.2.3 Containment on or Under Ice**

Containment of spills on ice will be affected by the load bearing strength of the ice. If it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dyke should be lined with plastic to make it impermeable to the fuel. Water may be sprayed on snow dams/dykes to form an impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

If the spill penetrated the ice, containment becomes more difficult. If the water beneath the ice is standing, the ice will be broken to install a containment boom.

If the water is flowing slowly, ice slotting may be used. A trench is cut into the ice downstream of the spill and at an angle to the current to deflect and concentrate the spill. Spilled material that collects in the ice slot may be pumped out, absorbed or burned in place.

Vertical barriers, e.g. plywood sheets, may be inserted into the ice to deflect the movement of spilled material. Trenches should be cut in the ice at an angle to the direction of flow. The vertical barriers are inserted in the slots and allowed to freeze into place. The extent of the under ice spill may be monitored by boring observation holes into the ice with an auger.

### **6.2.4 Containment on Snow**

Snow will readily absorb liquids which may facilitate the removal of spilled material to a recovery or disposal site. Saturated contaminated snow may be collected relatively easily and hauled away. Compacted snow can be used to create an effective physical barrier to reduce the spread of spilled materials.

Several types of snow containment structures may be constructed to contain spilled material. Snow dykes can be constructed and then lined with an impermeable liner or sprayed with water to form an impermeable ice layer. Initially the snow around the perimeter of the spill can be compacted, eg. with a snowmobile, to slow the movement

of contaminants. The saturated snow can be collected with hand tools or heavy equipment and removed to the land fill for disposal or recovery.

Caution should be exercised as spilled material can migrate under snow cover for considerable distances and cannot be visible from above.

### **6.2.5 Fire or Explosion**

The first step to be taken at a site where there is a fire or explosion risk, or if the material is on fire is to evacuate people from the surrounding area. Dykes or trenches are then constructed down slope of the spilled material to minimize spread of unburned liquids and/or the fire. The fire may then be extinguished using suitable methods and action may be taken to prevent further spillage, contain the material and begin clean-up procedures.

### **6.2.5 Material Removal**

Removal of the spilled fuels may be accomplished using several techniques. Generally, methods used include suction, mechanical removal and the application of absorbent material.

Suction methods may be used initially if there is significant quantity of free product on the ground or on the surface of a water body. Equipments used to recover material in this fashion may include vacuum trucks, portable pumps or shop vacuums.

Suction screens may be required to prevent hose plugging and possible dump damage.

Mechanical recovery using hand tools or heavy equipment should be used to collect soils or other loose material contaminated by the fuel. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause a greater environmental impact from the operation of the equipment than from the material itself.

Absorbents may be used to soak up petroleum product. They are commonly used for final clean-up, recovery of small amounts of fuel or to remove fuel from places which are inaccessible to other spill clean up methods. Snow and soil can be used as absorbent material for a variety of petroleum products. The saturated absorbent can be collected mechanically and moved to a suitable disposal location.

Recovered liquids will be disposed of in accordance with appropriate GNWT regulations. Saturated soils and absorbents will be transported to the landfill for disposal.

## **6.3 Chlorine Gas Leak**

**Chlorine is a very toxic gas. Appropriate personal safety equipment must be worn by personnel attempting to contain a leak. Two Class A response suites with Scott packs are located at the Fire Department for use in the event of a leak.**

### **6.3.1 Containment and Disposal**

Capping tools are available for sealing leaking cylinders. If a cylinder is capped successfully, it may be returned to the supplier for disposal. If the cylinder cannot be capped, remove the cylinder to a safe location downwind of any populated area and allow the gas to escape.

## 7.0 SPILL EQUIPMENT INVENTORY

### 7.1 Spill Equipment Inventory

The following is a listing of equipment owned by the City of Iqaluit that may be used in the event of a spill emergency. The usual location of the equipment is also indicated.

<b>MUNICIPAL SPILL EMERGENCY EQUIPMENT</b>	
<b>EQUIPMENT</b>	<b>STORAGE LOCATION</b>
2 Cat 950 Loaders	1 at the Municipal Garage 1 at 1552 Parking Garage
1 Rubber Tired Backhoe	Municipal Garage (outside)
2 Dump Trucks	1 at the Apex Parking Garage 1 at the Municipal Garage
1 Cat 814 Wheel Dozer	1 at the Air Base Garage
2 Road Graders	1 at 1552 Parking Garage 1 at the Apex parking Garage
1 Cat M322 Excavator with hammer	1 at the Municipal Garage (outside)
4 Sewage Trucks	4 at the Airbase Parking Garage
5 Water Trucks	1 at the Airbase Parking Garage 4 at the Apex Parking Garage
1 Cat 966 Loader	1 at the Apex Parking Garage

### 7.2 Resource Contact

The following is a listing of internal and external resources that may be contacted for aid in the event of a spill.

<b>RESOURCES</b>		
<b>CONTACT</b>	<b>CONTACT #</b>	<b>RESOURCE PROVIDED</b>
Fire Department: Volunteers	979-4422	Manpower, Trucks, Foam
Fire Department: Ambulance	979-4422	Medical, Rescue Equipment
Fire Department: EMO	979-4422	Evacuation, Rescue
24-Hour Spill Report Line	(867)920-8130	Expert Advice
External Contractors	See Appendix G for As and When Contracts	Manpower, Equipment

## 8.0 TRAINING EXERCISES

Training and communication exercises should be carried on an annual basis to determine the actual readiness and ability of the City to handle a spill emergency. The exercised should be served to train key personnel and determine any weaknesses in the plan prior to the occurrence of an emergency situation. A variety of scenarios should be tested, eg. sewage spills from the force main, sewage lagoon dam failures, chlorine gas leaks, fuel spills, etc. to ensure that appropriate action can be take quickly.

The Fire Department and the Emergency Measures Organization (EMO) currently conduct disaster training exercises in the City of Iqaluit. Neither of these groups target hazardous material scenarios specifically, but a spill situation is often included as part of the larger exercise.

The Worker's Compensation Board will provide funding for employees to participate in hazardous material courses if contact with hazardous materials is a component of the employee's job description. Courses available include Materials Safety Data Sheets (MSDS), Workplace Hazardous Materials Systems (WHMIS) and First Aid.

# Appendix **|**

## Monitoring Locations Plan



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Checked: \_\_\_\_\_  
Designer: \_\_\_\_\_  
Project Management Initials: \_\_\_\_\_  
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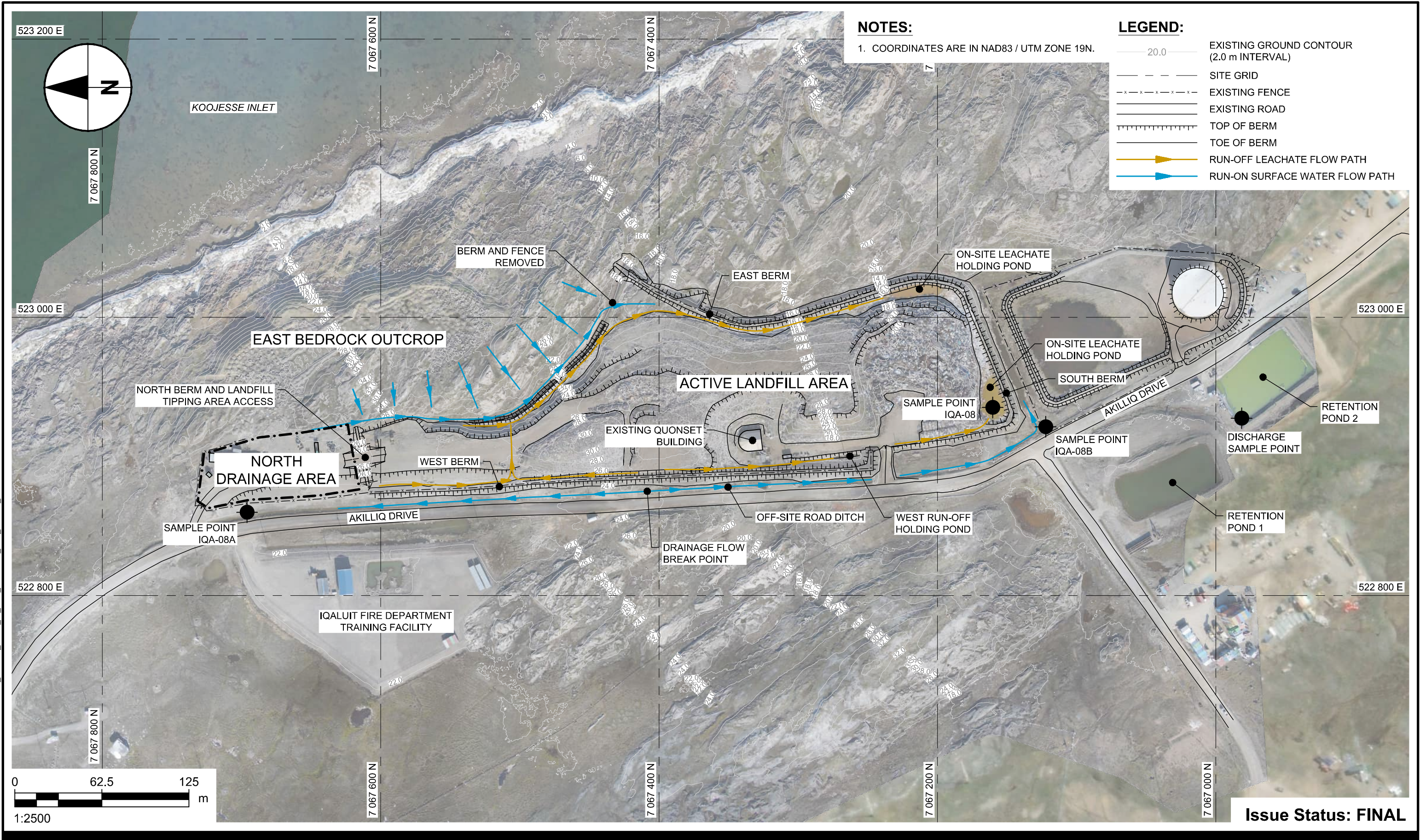


# Appendix **J**

## Stormwater Management



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# Appendix **K**

## Waste Battery Management



# Environmental Guideline for Waste Batteries



Department of Environment  
Government of Nunavut

## **GUIDELINE: WASTE BATTERIES**

Original: January 2002

Revised: January 2011

This Guideline has been prepared by the Department of Environment's Environmental Protection Division and approved by the Minister of Environment under the authority of Section 2.2 of the *Environmental Protection Act*.

This Guideline is not an official statement of the law and is provided for guidance only. Its intent is to increase the awareness and understanding of the risks, hazards and best management practices associated with waste batteries. This Guideline does not replace the need for the owner or person in charge, management or control of the waste to comply with all applicable legislation and to consult with Nunavut's Department of Environment, other regulatory authorities and qualified persons with expertise in the management of waste batteries.

Copies of this Guideline are available upon request from:

Department of Environment  
Government of Nunavut

P.O. Box 1000, Station 1360, Iqaluit, NU, X0A 0H0

Electronic version of the Guideline is available at <http://env.gov.nu.ca/programareas/environmentprotection>

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## Introduction

Batteries come in many different shapes, sizes and voltages. There are two basic categories of batteries in use: *non-rechargeable*, which are designed to be used once and discarded, and *rechargeable*, which can be recharged and used many times. Non-rechargeable batteries, such as the common alkaline battery, use a *dry cell* where the electrolyte is immobilized as a paste. This enables the battery to be operated in a random position. These batteries are commonly used in household items such as flashlights, calculators, toys, cameras and remote control devices. Rechargeable batteries use either a *dry cell* or *wet cell*. Wet cell rechargeable batteries have a liquid electrolyte and are commonly used by consumers in automobiles, ATVs and snowmobiles, and by industry in large uninterruptable power supplies and for telecommunications standby power. Dry cell rechargeable batteries can be used in many of the same consumer products as non-rechargeable batteries.

Approximately 671 million, or 95%, of the 707 million consumer and industrial batteries sold in Canada in 2007 were non-rechargeable. Of this total, 418 million were alkaline, 188 million were carbon-zinc and 65 million were button cell batteries. Sales of rechargeable batteries were approximately 37 million. Of this total, 16.5 million were nickel-cadmium, 6.4 million were nickel-metal-hydride, 2.8 million were lithium ion and 10.6 million were lead-acid batteries (EC, 2009).

The *Environmental Guideline for Waste Batteries* (the Guideline) provides information on the types, uses and potential environmental and human health effects of waste batteries and guidance on their proper storage, transportation and disposal. It is not an official statement of the law. For further information and guidance, the owner or person in charge, management or control of waste batteries is encouraged to review all applicable legislation and consult the Department of Environment, other regulatory agencies or qualified persons with expertise in the management of waste batteries.

The *Environmental Protection Act* enables the Government of Nunavut to implement measures to preserve, protect and enhance the quality of the natural environment. Section 2.2 of the *Act* provides the Minister with authority to develop, coordinate, and administer the Guideline.

### 1.1 Definitions

<i>Battery</i>	One or more electrochemical cells capable of storing and transforming chemical energy into electrical energy.
<i>Commissioner's Land</i>	Lands that have been transferred by Order-in-Council to the Government of Nunavut. This includes roadways and land subject to block land transfers. Most Commissioner's Land is located within municipalities.
<i>Contaminant</i>	Any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment, (a) endangers the health, safety or welfare of persons, (b) interferes or is likely to interfere with normal enjoyment of life or property, (c) endangers the health of animal life, or (d) causes or is likely to cause damage to plant life or to property.

<i>Dangerous Good</i>	Any product, substance or organism included by its nature or by the <i>Transportation of Dangerous Goods Regulations</i> in any of the classes listed in the schedule provided in the <i>Transportation of Dangerous Goods Act</i> .
<i>Electrolyte</i>	A gel or liquid that is capable of conducting electricity.
<i>Environment</i>	The components of the Earth and includes (a) air, land and water, (b) all layers of the atmosphere, (c) all organic and inorganic matter and living organisms, and (d) the interacting natural systems that include components referred to in paragraphs (a) to (c) above.
<i>Minister</i>	The Minister of Environment of the Government of Nunavut.
<i>Qualified Person</i>	A person who has an appropriate level of knowledge and experience in all relevant aspects of waste management.
<i>Responsible Party</i>	The owner or person in charge, management or control of the waste.
<i>Transport Authority</i>	The statute and regulations controlling the management of hazardous waste under that mode of transport. These include (a) Road and Rail - <i>Transportation of Dangerous Goods Act (Canada) and Regulations; Interprovincial Movement of Hazardous Waste Regulations and Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations</i> . (b) Air – <i>International Air Transport Association (IATA) Dangerous Goods Regulations and International Civil Aviation Organization (ICAO) Technical Instructions</i> ; and (c) Marine – <i>International Maritime Dangerous Goods Code (IMDG)</i> .
<i>Waste Battery</i>	A battery that is no longer wanted or is unusable for its intended purpose and is intended for storage, recycling or disposal.

## **1.2 Roles and Responsibilities**

### **1.2.1 Department of Environment**

The Environmental Protection Division is the key environmental agency responsible for ensuring parties properly manage waste batteries and will provide advice and guidance on their management. Authority is derived from the *Environmental Protection Act*, which prohibits the discharge of contaminants to the environment and enables the Minister to undertake actions to ensure appropriate management measures are in place. Although programs and services are applied primarily to activities taking place on Commissioner's and municipal lands and to Government of Nunavut undertakings, the *Environmental Protection Act* may be applied to the whole of the territory where other controlling legislation, standards and guidelines do not exist. A complete listing of relevant legislation and guidelines can be obtained by contacting the Department of Environment or by visiting the web site at <http://env.gov.nu.ca/programareas/environmentprotection>.

### **1.2.2 Generators of Waste Batteries**

The owner or person in charge, management or control of waste batteries is known as the responsible party. In general, the responsible party must ensure batteries are properly and safely managed from the time they are manufactured to their final disposal. This is referred to as managing the waste from cradle-to-grave. Information on the general management of hazardous waste in Nunavut, including generator, carrier and receiver responsibilities, can be obtained by referring to the *Environmental Guideline for the General Management of Hazardous Waste*.

Contractors may manage unwanted or waste batteries on behalf of the responsible party. However, the responsible party remains liable for ensuring the method of management complies with all applicable statutes, regulations, standards, guidelines and local by-laws. If the contractor does not comply with the requirements of the *Environmental Protection Act* and is charged with a violation while managing the waste, the responsible party may also be charged.

### **1.2.3 Other Regulatory Agencies**

Other regulatory agencies may have to be consulted regarding the management of waste batteries as there may be other environmental or public and worker health and safety issues to consider.

#### **Workers' Safety and Compensation Commission**

The Workers' Safety and Compensation Commission is responsible for promoting and regulating worker and workplace health and safety in Nunavut. The Commission derives its authority from the *Workers' Compensation Act* and *Safety Act* which require an employer to maintain a safe workplace and ensure the safety and well being of workers.

#### **Department of Community and Government Services**

The Department of Community and Government Services is responsible under the *Commissioners' Lands Act* for the issuance of land leases, reserves, licenses and permits on Commissioner's Lands. The Department, in cooperation with communities, is also responsible for the planning and funding of municipal solid waste and sewage disposal facilities in most Nunavut communities.

#### **Department of Health and Social Services**

Activities related to the handling and management of waste batteries may have an impact on public health. The Office of the Chief Medical Officer of Health and Regional Environmental Health Officers should be consulted regarding legislated requirements under the *Public Health Act*.

#### **Department of Economic Development and Transportation**

The Motor Vehicles Division of the Department of Economic Development and Transportation is responsible for the safe transport of hazardous waste and other dangerous goods by road through administration of the *Transportation of Dangerous Goods Act*. The Department is also responsible under the *Motor Vehicles Act* for driver licensing and various other vehicle and road safety matters.

### **Environment Canada**

Environment Canada is responsible for administering the *Canadian Environmental Protection Act (CEPA)* and for regulating the interprovincial and international movement of hazardous waste under the *Interprovincial Movement of Hazardous Waste Regulations* and *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. Environment Canada is also responsible for administering the pollution prevention provisions of the federal *Fisheries Act* and owns the EcoLogo initiative, which is designed to help consumers and industry make more environmentally conscious purchasing decisions.

### **Indian and Northern Affairs Canada**

Indian and Northern Affairs Canada is responsible under the *Territorial Lands Act* and *Nunavut Waters and Nunavut Surface Rights Tribunal Act* for the management of federal lands and waters, including the impact waste batteries may have on the quality of these lands and waters.

### **Local Municipal Governments**

The role of municipal governments is important in the proper local management of waste batteries. Under the Nunavut Land Claims Agreement, municipalities are entitled to control their own municipal disposal sites. Unwanted waste may be deposited into municipal landfill sites and sewage lagoons only with the consent of the local government. The local fire department may also be called upon if a fire or other public safety issue involving batteries is identified.

### **Co-management Boards and Agencies**

Co-management boards and agencies established under the Nunavut Land Claims Agreement have broad authority for land use planning, impact assessment and the administration of land and water. Activities involving the management and disposal of waste batteries may be controlled through the setting of terms and conditions in plans, permits and licenses issued by the Nunavut Water Board and other co-management boards and agencies.

## Types, Uses and Potential Effects of Batteries

### 2.1 Types and Uses

Batteries are classified into two broad categories: *non-rechargeable* and *rechargeable*.

Non-rechargeable batteries, also known as primary batteries, can produce electrical current immediately upon being inserted into a device and are intended to be used and discarded. They are commonly used in portable devices that have a low current drain, are used only intermittently or are used well away from an alternative electrical power source (i.e. a wall plug-in or portable generator). Non-rechargeable batteries cannot be safely recharged since the active materials may not return to their original form and the chemical reactions may not be easily reversible. Common types of non-rechargeable batteries include alkaline, carbon-zinc and button cell. All non-rechargeable batteries are dry cell batteries.



Figure 1 – Common Consumer Batteries  
Source: Public Domain

Rechargeable batteries, also known as secondary batteries, are sold in a discharged state and must be charged prior to use. These batteries are designed to be repeatedly charged by applying an electric current, which reverses the chemical reactions that occur during use. The oldest type of rechargeable wet cell battery is the common lead-acid battery used to start cars, trucks, snowmobiles and ATVs. These batteries are heavy because they contain large quantities of lead and can provide significant peak electrical current. A semi-solid electrolyte has replaced sulphuric acid in newer lead-acid batteries to prevent spillage. Other rechargeable batteries include several portable dry cell types including nickel-cadmium, nickel-metal-hydride and lithium-ion. Nickel-cadmium batteries currently have the largest share of the dry cell rechargeable market although nickel-metal-hydride and lithium-ion batteries have begun to replace them in many applications because of their higher capacity.

Table 1 describes the most common batteries in use and their applications.

### 2.2 Potential Effects on Environment and Human Health

Modern batteries contain a variety of corrosive and poisonous materials (i.e. electrolytes and heavy metals including lead, cadmium and nickel). Some older batteries also contain mercury, although in the 1990s manufacturers started to eliminate or reduce the amount of mercury found in their batteries. These contaminants can leach into water and soil from batteries that have been disposed of in landfills or abandoned on the land. Contact with the corrosive electrolytes can cause chemical burns to eyes and skin while heavy metals can bioaccumulate<sup>1</sup> and biomagnify<sup>2</sup> in living organisms, affecting these organisms and those that prey upon them.

<sup>1</sup> The accumulation over time of metals and other persistent substances within an organism from both biotic (i.e. other organisms) or abiotic (i.e. land, air and water) sources.

**Table 1. Common Batteries and Their Applications**

Battery Type	Description	Common Applications
<b>Non-rechargeable (Primary)</b>		
<b>Alkaline</b>	Sizes: AAA, AA, C, D, 6V and 9V. Alkaline batteries contain zinc and manganese with an electrolyte of potassium hydroxide or sodium hydroxide. Both electrolytes are strongly alkaline.	Flashlights, clocks, calculators, toys, smoke detectors, remote controls
<b>Carbon-Zinc</b>	Sizes: AAA, AA, C, D, 6V and 9V. Carbon-zinc batteries contain zinc and manganese with an electrolyte solution of ammonium chloride and zinc chloride. Ammonium chloride is a severe eye irritant and zinc chloride is corrosive.	Flashlights, clocks, calculators, toys, smoke detectors, remote controls, garage door openers
<b>Button Cell – Silver-Oxide, Lithium, Alkaline, Zinc-Air</b>	Various sizes. Button cell batteries are single cells shaped like a squat cylinder. Numerous types of button cells exist and may contain zinc, lithium, manganese, silver and other metals. Mercuric-oxide button cells are no longer available due to the toxicity and environmental hazards associated with mercury.	Watches, hearings aids, toys, cameras, pagers, remote controls, greeting cards
<b>Rechargeable (Secondary)</b>		
<b>Vehicle Lead-Acid</b>	Sizes: 6V and 12V. Lead-acid batteries contain lead and a sulphuric acid electrolyte. The battery can contain between 60 and 75% lead, by weight. Sulphuric acid is a strong oxidizing agent and can cause severe skin burns or irritation upon contact.	Cars, trucks, motorcycles, snowmobiles
<b>Sealed Lead-Acid</b>	Sizes: 2V, 6V and 12V. Commonly referred to as the 'maintenance-free battery', sealed lead-acid batteries are similar to the vehicle lead-acid battery except the case is sealed. Safety valves allow venting of gas during charge and discharge.	Video cameras, power tools, wheelchairs, ATVs, computer power backup systems
<b>Nickel-Cadmium (NiCd)</b>	Sizes: AAA, AA, C, D, 6V and 9V. Nickel-cadmium batteries contain cadmium and nickel oxyhydroxide with a potassium hydroxide electrolyte. The electrolyte is strongly alkaline.	Flashlights, toys, cellular phones, handheld power tools
<b>Nickel-Metal-Hydride (NiMH)</b>	Sizes: AAA, AA, C, D, 6V and 9V. Nickel-metal-hydride batteries are similar to nickel-cadmium batteries except the cadmium has been replaced with a hydrogen-absorbing metal alloy. NiMH batteries have 2-3 times the capacity of an equivalently sized NiCd battery.	Flashlights, toys, cellular phones, power tools, computer packs
<b>Lithium-Ion</b>	Various sizes. Conventional lithium-ion batteries contain graphite and one of several different lithium metal oxides. The electrolyte is a lithium salt in an organic solvent. Pure lithium reacts vigorously with water to release gases.	Calculators, cameras, laptop computers, computer memory back-up systems

<sup>2</sup> The progressive buildup of metals or other persistent substances through successive trophic levels – meaning that it relates to the concentration ratio in the tissue of a predator as compared to that in its prey.

Charging a battery produces a small amount of hydrogen and oxygen. Overcharging can result in these gases being generated faster than they can escape from within the walls of the battery, resulting in an explosion. This process is known as 'gassing'. Explosions can also occur through the misuse or malfunction of a battery including attempting to charge a non-rechargeable battery or short-circuiting a high output lead-acid battery.

Small button batteries have also been known to be swallowed by children. Although the likelihood of the battery becoming lodged in the throat depends upon the child's age and size of the battery, caution should still be exercised around very young children. While in the digestive tract a battery's electrical discharge could burn the surrounding tissues.

## Waste Management

*Minimizing or avoiding the creation of pollutants and wastes can be more effective in protecting the environment than treating or cleaning them up after they have been created.*<sup>3</sup>

### 3.1 Pollution Prevention

Pollution prevention is a term used to describe methods and practices that minimize or eliminate the generation of waste. Pollution prevention strategies for waste batteries include the following:

- Reduce*
- Check to see if you already have the right batteries on hand before purchasing more.
  - Consider replacing non-rechargeable batteries with rechargeable batteries.
  - Look for batteries that have less heavy metals and mercury by reading the label and choosing Ecologo certified products. A complete listing of environmentally-preferable products is available for downloading at <http://www.ecologo.org/en/index.asp>.
  - Avoid accidental discharge by preventing the battery terminals from contacting conductive (i.e. metal) materials. This includes removing the batteries from equipment when the equipment will not be used for extended periods of time.
  - Keep batteries cool and dry when not in use. Battery life can be extended further by storage at low temperature (i.e. in a refrigerator) as this slows the chemical reactions. Batteries must be returned to room temperature to achieve their maximum voltage.
  - Rechargeable lithium and nickel-cadmium batteries should be stored at 40% state-of-charge while nickel-metal-hydride can be stored at any state to extend their operational life. Lead-acid batteries should always be stored at full charge.
- Reuse*
- Service lead-acid batteries regularly (i.e. electrolyte levels).
  - Charge rechargeable batteries using a charger specifically designed for the size and type of battery.
  - Donate unused batteries to others including local theatres, schools, clubs, churches or Hunters and Trappers Associations.
  - Make an agreement with your supplier to return un-opened or unused batteries.
- Recycle*
- Send unwanted or spent batteries to registered recyclers. The Rechargeable Battery Recycling Corporation (RBRC) voluntary recycling program accepts nickel-cadmium, nickel-metal-hydride, lithium-ion and small sealed lead batteries at participating retailers across Canada. Check RBRC's web site at <http://www.rbrc.org> for the nearest drop-off location. The names of commercial and industrial battery recyclers can be obtained by contacting the waste exchanges and associations listed in Appendix 10 of the *Environmental Guideline for the General Management of Hazardous Waste*.

The *Workplace Hazardous Materials Information System* (WHMIS) is Canada's national hazard communication standard and is administered by the Workers' Safety and Compensation Commission. Key elements of WHMIS are the provision of material safety data sheets (MSDS), labeling instructions and worker education and training programs. MSDS are available from battery manufacturers and contain information on the properties of batteries, along with instructions on safe use and handling.

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<sup>3</sup> Source – Canadian Council of Ministers of the Environment.

### 3.2 Storage

Storage refers to the maintenance of waste batteries while awaiting recycling, transport or disposal. Storage is not acceptable for the long-term management of waste batteries except under extraordinary circumstances and should be considered as a temporary measure only.

Unwanted or waste batteries should be stored in the following manner:

- Large quantities of unwanted wet cell (i.e. vehicle lead-acid, sealed lead acid) batteries should be placed on strong wooden pallets to keep the batteries off the ground and to make relocation with a forklift easier. Batteries should be stacked no more than 3 high and shrink-wrapped with plastic to stabilize the pallet. When stacking batteries, the battery terminals should be protected from short circuit by separating each layer using a non-conductive material, such as a sheet of plywood. When wet-cell batteries are individually stored and packaged for transport, the container must meet the requirements of the Canadian General Standards Board standard CGSB-43.150 (TC, 2010).
- Large quantities of unwanted dry cell batteries should be stored in sound and sealable containers. The containers should be located so as to be protected from sun, weather and physical damage.
- Each container must be clearly labeled to identify its contents. If waste batteries are being stored in an institutional, commercial or industrial location or if the batteries are being stored for transport, the containers must be labeled in accordance with the *Workplace Hazardous Materials Information System* (WHMIS) and relevant Transport Authority.
- Place all labeled containers in a secure and clearly marked area which is separate from other waste to prevent its disposal with normal garbage.
- Workers should be trained in the safe use, handling and shipping of waste batteries, have access to material safety data sheets and be provided with personal protective equipment. Only trained personnel should have access to the designated storage area.
- All types of batteries should be stored out of reach of small children and pets. Children and other family members should be made aware of the hazards associated with batteries.



Figure 2 – The Proper and Improper Storage of Lead-Acid Batteries  
Source: Transport Canada

If a commercial facility is used to store hazardous waste for periods of 180 days or more or the quantity of waste batteries and other waste on-site at any one time exceeds the criteria set out in the *Environmental Guideline for the General Management of Hazardous Waste*<sup>4</sup>, the facility must be registered with the Department of Environment as a hazardous waste management facility. Copies of registration forms are available at <http://env.gov.nu.ca/programareas/environmentprotection/forms-applications> or by contacting Nunavut's Department of Environment. Refer to the *Environmental Guideline for the General Management of Hazardous Waste* for additional information on the registration process.

### 3.3 Transportation

Not all types of waste batteries are subject to the *Transportation of Dangerous Goods Act*. For example, sealed lead-acid and vehicle lead-acid batteries that contain sulphuric acid electrolyte are classified as a dangerous good while household alkaline, nickel-cadmium, nickel-metal-hydride, silver-zinc and some small lithium batteries are not. If in doubt, contact the manufacturer or consignor to determine whether the battery is a dangerous good or simply assume it is and manage it accordingly. Section 3.3 *Transportation* applies only to batteries that are classified as being a dangerous good.

Waste batteries that are classified as being a dangerous good may also be a hazardous waste for the purpose of transportation, depending upon the quantity being transported. Under the federal *Interprovincial Movement of Hazardous Waste Regulations* and *Export and Import of Hazardous Waste and Recyclable Material Regulations*, no person may transport hazardous waste in Canada or internationally for purposes of disposal or recycling in a quantity greater than five litres or five kilograms unless it is accompanied by a completed manifest. Manifest forms are available from Nunavut's Department of Environment and completion instructions are included on the reverse side of each manifest. Further information on manifesting can be obtained by referring to the *Environmental Guideline for the General Management of Hazardous Waste* or Environment Canada's *User's Guide for the Hazardous Waste Manifest*.

When transporting waste batteries as a hazardous waste, the documentation, packaging, labeling and placarding must conform to the federal and territorial *Transportation of Dangerous Goods Act* and *Regulations*. Schedule I of the *Regulations* classifies waste batteries as follows:

Shipping Name:	WASTE Batteries, Wet, Filled with Acid
Classification:	8
Product Identification Number:	UN2794
Packing Group:	III
Shipping Name:	WASTE Batteries, Wet, Filled with Alkali
Classification:	8
Product Identification Number:	UN2795
Packing Group:	III

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<sup>4</sup> The criterion for Class 4.3 Water Reactive Waste is 500 litres or kilograms, for Class 8 Corrosives and Class 9 Miscellaneous Waste is 1000 litres or kilograms and the total aggregate quantity is 5000 litres or kilograms.

Shipping Name:	WASTE Batteries, Wet, Non-Spillable Classification: 8 Product Identification Number: UN2800 Packing Group: III Special Provision: 39
Shipping Name:	WASTE Batteries, Dry, Containing Potassium Hydroxide Solid Classification: 8 Product Identification Number: UN3028 Packing Group: III
Shipping Name:	WASTE Lithium Batteries Classification: 9 Product Identification Number: UN3090 Packing Group: II Special Provision: 34
Shipping Name:	WASTE Batteries Containing Sodium or WASTE Cells Containing Sodium Classification: 4.3 Product Identification Number: UN3292 Packing Group: II

The transport of waste batteries in Canada or internationally by aircraft must conform to the *International Air Transport Association (IATA) Dangerous Goods Regulations* and *International Civil Aviation Organization (ICAO) Technical Instructions*, while transport by marine vessel must conform to the *International Marine Dangerous Goods (IMDG) Code*. Further information on transporting waste batteries by aircraft or marine vessel can be obtained by contacting Transport Canada or by referring to the appropriate Transport Authority.

Hazardous waste generators, carriers and receivers must be registered with the Nunavut Department of Environment. A unique registration number is assigned to each registrant through the registration process, which enables completion of the manifest document. Copies of registration forms are available at <http://env.gov.nu.ca/programareas/environmentprotection/forms-applications> or by contacting Nunavut's Department of Environment. Refer to the *Environmental Guideline for the General Management of Hazardous Waste* for additional information on the registration process.

A listing of hazardous waste generators, carriers, receivers and management facilities registered to operate in Nunavut is available by contacting Nunavut's Department of Environment.

### 3.4 Disposal

Unwanted or waste batteries must be properly recycled or disposed of. Heavy metals found in some types of batteries (i.e. nickel-cadmium, nickel-metal-hydride and lead-acid batteries) are toxic to wildlife and can contaminate food and water supplies. Sulphuric acid electrolyte spilled from lead-acid batteries is corrosive to skin, affects plant survival and leaches metals from other landfilled garbage. Other types of batteries (i.e. household alkaline and carbon zinc batteries) don't have a recycling method and can be disposed of in a landfill along with other household garbage. Table 2 describes disposal methods for common batteries.

Waste batteries that are generated in large quantities by commercial, industrial, institutional or government operations should be safely stored until they can be transported to a commercial recycler or registered hazardous waste receiver. Names of Canadian recyclers and disposal companies are available by contacting the waste management exchanges and associations listed in Appendix 10 of the *Environmental Guideline for the General Management of Hazardous Waste*.

**Table 2. Disposal Methods for Common Batteries**

Battery Type	Sizes Available	Disposal Method <sup>5</sup>
<b>Alkaline</b>	AAA, AA, C, D, 6V and 9V.	Dispose along with household garbage.
<b>Carbon-Zinc</b>	AAA, AA, C, D, 6V and 9V.	Dispose along with household garbage.
<b>Button Cell – Silver-Oxide, Lithium, Alkaline, Zinc-Air</b>	Various sizes.	Alkaline – Dispose along with household garbage. All other types – return to a licensed recycler.
<b>Vehicle Lead-Acid</b>	6V and 12V.	Return to a licensed recycler.
<b>Sealed Lead-Acid</b>	2V, 6V and 12V.	Return to a licensed recycler.
<b>Nickel-Cadmium (NiCd)</b>	AAA, AA, C, D, 6V and 9V.	Return to a licensed recycler.
<b>Nickel-Metal-Hydrate (NiMH)</b>	AAA, AA, C, D, 6V and 9V.	Return to a licensed recycler.
<b>Lithium-Ion</b>	Various sizes.	Return to a licensed recycler.

Some municipalities in Nunavut are implementing programs aimed at collecting and safely storing household hazardous waste as part of their garbage collection programs. Residents wishing to locally dispose of waste batteries should contact their municipality for other disposal options.

Consideration will be given by Nunavut’s Department of Environment to management methods that differ from instructions provided in the Guideline where it can be demonstrated that the proposal would result in an equivalent level of environmental protection.

<sup>5</sup> The Rechargeable Battery Recycling Corporation (RBRC) will accept nickel-cadmium, nickel-metal-hydrate, lithium-ion and small sealer lead (up to 2 lbs or 1 kilogram each) batteries only. Check RBRC’s web site at <http://www.rbrc.org> for the nearest drop-off location.

## Conclusion

Batteries are classified into two broad categories: *non-rechargeable* and *rechargeable* and come in many different shapes, sizes and voltages. Non-rechargeable batteries use a *dry cell* where the electrolyte is immobilized as a paste and are commonly used in small household items such as flashlights, calculators, toys, cameras and remote control devices. Rechargeable batteries use either a *wet cell* or *dry cell*. Unlike dry cell batteries, wet cell rechargeable batteries have a liquid electrolyte and are commonly used where greater electrical current is required such as in automobiles, ATVs and snowmobiles and for large industrial uninterruptable power supplies. Rechargeable batteries can be used for many of the same applications as non-rechargeable batteries.

More than 700 million consumer and industrial batteries are sold each year in Canada. With current recycling rates estimated to be between 5 and 10%, more than 630 million spent or unwanted batteries are stored or disposed of each year in Canada alone. The *Environmental Guideline for Waste Batteries* is an introduction to the management of these wastes. It provides information on the characteristics of batteries, possible effects on the environment and human health and guidance on proper storage, transportation and disposal.

Familiarity with the Guideline does not replace the need for the owner or person in charge, management or control of waste batteries to comply with all applicable federal and territorial legislation and municipal by-laws. The management of batteries may also be controlled through permits and licenses issued by Nunavut's co-management boards, Indian and Northern Affairs Canada and other regulatory agencies. These permits and licenses must be complied with at all times.

For additional information on the management of waste batteries, or to obtain a listing of available guidelines, go to the Department of Environment web site or contact the Department at:

Environmental Protection Division  
Department of Environment  
Government of Nunavut  
Inuksugait Plaza, P.O. Box 1000, Station 1360  
Iqaluit, Nunavut X0A 0H0

Telephone: (867) 975-7729

Fax: (867) 975-7739

Email: [EnvironmentalProtection@gov.nu.ca](mailto:EnvironmentalProtection@gov.nu.ca)

Website: <http://env.gov.nu.ca/programareas/environmentprotection>

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<http://www.tc.gc.ca/eng/tdg/publications-bulletins-transportingbatteries-1099.htm>

## **APPENDICES**



## **APPENDIX 1 - ENVIRONMENTAL PROTECTION ACT**

The following are excerpts from the *Environmental Protection Act*

1. "Contaminant" means any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment,
  - (a) endangers the health, safety or welfare of persons,
  - (b) interferes or is likely to interfere with normal enjoyment of life or property,
  - (c) endangers the health of animal life, or
  - (d) causes or is likely to cause damage to plant life or to property;

"Discharge" includes, but not so as to limit the meaning, any pumping, pouring, throwing, dumping, emitting, burning, spraying, spreading, leaking, spilling, or escaping;

"Environment" means the components of the Earth and includes

- (a) air, land and water,
- (b) all layers of the atmosphere,
- (c) all organic and inorganic matter and living organisms, and
- (d) the interacting natural systems that include components referred to in paragraphs (a) to (c).

"Inspector" means a person appointed under subsection 3(2) and includes the Chief Environmental Protection Officer.

- 2.2 The Minister may
  - (a) establish, operate and maintain stations to monitor the quality of the environment in the Territories;
  - (b) conduct research studies, conferences and training programs relating to contaminants and to the preservation, protection or enhancement of the environment;
  - (c) develop, co-ordinate and administer policies, standards, guidelines and codes of practice relating to the preservation, protection or enhancement of the environment;
  - (d) collect, publish and distribute information relating to contaminants and to the preservation, protection or enhancement of the environment:
3.
  - (1) The Minister shall appoint a Chief Environmental Protection Officer who shall administer and enforce this Act and the regulations.
  - (2) The Chief Environmental Protection Officer may appoint inspectors and shall specify in the appointment the powers that may be exercised and the duties that may be performed by the inspector under this Act and regulations.
5.
  - (1) Subject to subsection (3), no person shall discharge or permit the discharge of a contaminant into the environment.
  - (3) Subsection (1) does not apply where the person who discharged the contaminant or permitted the discharge of the contaminant establishes that
    - (a) the discharge is authorized by this Act or the regulations or by an order issued under this Act or the regulations;
    - (b) the contaminant has been used solely for domestic purposes and was discharged from within a dwelling house;
    - (c) the contaminant was discharged from the exhaust system of a vehicle;

- (d) the discharge of the contaminant resulted from the burning of leaves, foliage, wood, crops or stubble for domestic or agricultural purposes;
- (e) the discharge of the contaminant resulted from burning for land clearing or land grading;
- (f) the discharge of the contaminant resulted from a fire set by a public official for habitat management of silviculture purposes;
- (g) the contaminant was discharged for the purposes of combating a forest fire;
- (h) the contaminant is a soil particle or grit discharged in the course of agriculture or horticulture; or
- (i) the contaminant is a pesticide classified and labelled as "domestic" under the *Pest Control Products Regulations* (Canada).

(4) The exceptions set out in subsection (3) do not apply where a person discharges a contaminant that the inspector has reasonable grounds to believe is not usually associated with a discharge from the excepted activity.

- 5.1. Where a discharge of a contaminant into the environment in contravention of this Act or the regulations or the provisions of a permit or license issued under this Act or the regulations occurs or a reasonable likelihood of such a discharge exists, every person causing or contributing to the discharge or increasing the likelihood of such a discharge, and the owner or the person in charge, management or control of the contaminant before its discharge or likely discharge, shall immediately:
- (a) subject to any regulations, report the discharge or likely discharge to the person or office designated by the regulations;
  - (b) take all reasonable measures consistent with public safety to stop the discharge, repair any damage caused by the discharge and prevent or eliminate any danger to life, health, property or the environment that results or may be reasonably expected to result from the discharge or likely discharge; and
  - (c) make a reasonable effort to notify every member of the public who may be adversely affected by the discharge or likely discharge.
6. (1) Where an inspector believes on reasonable grounds that a discharge of a contaminant in contravention of this Act or the regulations or a provision of a permit or license issued under this Act or the regulations has occurred or is occurring, the inspector may issue an order requiring any person causing or contributing to the discharge or the owner or the person in charge, management or control of the contaminant to stop the discharge by the date named in the order.
7. (1) Notwithstanding section 6, where a person discharges or permits the discharge of a contaminant into the environment, an inspector may order that person to repair or remedy any injury or damage to the environment that results from the discharge.
- (2) Where a person fails or neglects to repair or remedy any injury or damage to the environment in accordance with an order made under subsection (1) or where immediate remedial measures are required to protect the environment, the Chief Environmental Protection Officer may cause to be carried out the measures that he or she considers necessary to repair or remedy an injury or damage to the environment that results from any discharge.

## APPENDIX 2 – GOVERNMENT AND INDUSTRY CONTACTS

### Government of Nunavut

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Telephone: (867) 975-7729 Fax: (867) 975-7739

Motor Vehicles Division  
Department of Economic Development and  
Transportation  
P.O. Box 10  
Gjoa Haven, Nunavut X0B 1J0  
Telephone: (867) 360-4615 Fax: (867) 360-4619

Workers' Safety and Compensation Commission  
P.O. Box 669  
Baron Building/1091  
Iqaluit, Nunavut X0A 0H0  
Telephone: 1-877-404-4407 (toll free)  
Fax: 1-866-979-8501

Department of Community and Government  
Services (all Divisions)  
P.O. Box 1000, Station 700  
4th Floor, W.G. Brown Building  
Iqaluit, Nunavut X0A 0H0  
Telephone: (867) 975-5400 Fax: (867) 975-5305

Office of Chief Medical Health Officer of Health  
Department of Health and Social Services  
P.O. Box 1000, Station 1000  
Iqaluit, Nunavut X0A 0H0  
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### Government of Canada

Indian and Northern Affairs – Nunavut Region  
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Iqaluit, Nunavut X0A 0H0  
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Environment Canada (NWT and Nunavut)  
5019 52nd Street  
Yellowknife, Northwest Territories X1A 1T5  
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Department of Transport – Road, Rail, Marine, Air  
P.O. Box 8550  
344 Edmonton Street  
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Telephone: 1-888-463-0521 (toll free)  
Fax: (204) 983-8992 Road, Rail and Marine  
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### Industry

Rechargeable Battery Recycling Corporation  
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Telephone: (416) 535-9210  
[www.rbrc.org](http://www.rbrc.org)

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# **Lithium-ion battery safety primer**

## **For use, storage and disposal**

Prepared for the Royal Canadian Mounted Police

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01-06-2021



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# 1 Introduction

This document aims to provide guidance with regards to the use, storage, transportation and disposal of rechargeable lithium-ion batteries as well as emergency procedures involving such batteries. The first section consists of an overview of various rechargeable and primary lithium based batteries to provide context and highlight differences between these batteries, with the focus of this work being on lithium-ion rechargeable batteries. A basic description of the various form factors available and the metrics typically used to describe battery performance is included. The hazards to the battery's health and to users from the battery are also discussed.

The five topics of interest (use, storage, transportation, disposal and emergency response to hazards) are addressed individually in their own sections. Each of these sections begins with a discussions of the relevant hazards and causes of failure before discussing best practices and procedures. The document is concluded by a general summary of the various points to consider.

In this work, the term battery is used in a broad sense for convenience and, unless specified otherwise, includes single cells as well as modules and battery packs.

## 2 Background

In this section, a brief overview of battery technology and terminology is presented. The goal is to provide the reader with a basic understanding of battery terminology used on the market. The various types of batteries are first discussed, followed by the form factors available and performance metrics commonly used in specification sheets. An overview of the hazards to the battery and from the battery is presented.

### 2.1 Battery Types

Batteries rely on electro-chemical reactions to produce electrical energy on-demand. When a load is connected to the battery, the flow of electrons from the anode (-) to the cathode (+) is permitted, resulting in a chemical reaction inside the battery. Based on whether or not the reaction used is reversible, batteries are divided into two categories: primary (disposable) and secondary (rechargeable). In both cases, the batteries are named (with a few exceptions) based on the material used to make the cathode (positive electrode)

#### 2.1.1 Primary (disposable)

Lithium primary batteries offer good energy density, long shelf life and better low temperature performance compared to rechargeable lithium-ion. Lithium primary batteries (or simply lithium batteries) will usually be referred to as such by suppliers and not marketed as lithium-ion batteries. Below are some example of Lithium primary batteries that can be encountered:

- Manganese dioxide - Li-MnO<sub>2</sub>
- Carbon monofluoride - Li(CF)<sub>x</sub>
- Iron disulfide - Li-FeS<sub>2</sub>
- Thionyl-chloride - Li-SOCl<sub>2</sub>
- Sulphur dioxide - Li-SO<sub>2</sub>
- Aluminium manganese dioxide - Li/Al MnO<sub>2</sub>
- Lithium iron phosphate - Li-FePO<sub>4</sub> (outdated)

Note that although some of the types listed here use the same or similar cathode active material as lithium-ion batteries, they should not be recharged under any circumstances. Batteries designed as primary, typically do not have the required construction methods (thin electrodes, current collector foils, electrolytes, stability) that are suitable for multiple (hundreds) of charge-discharge cycles required for rechargeable batteries. Recharging primary batteries may lead to severe adverse effects such as fire, explosion or the release of toxic gases. Thionyl-chloride and sulphur dioxide batteries in particular are known for their highly toxic and corrosive content.

#### 2.1.2 Secondary (rechargeable)

In the case of lithium-ion rechargeable batteries, as electrons move from the anode (-) to the cathode (+) through the load, positive lithium ions (Li<sup>+</sup>) also migrate from the anode (-) to the cathode (+) within the battery. During charging, power is applied to force the opposite reaction, thus storing energy in the battery.

Common lithium-ion battery types are listed in Table 1 with the various names used to refer to them as well as the chemistry and relevant comments. Although some chemistries have been mostly superseded by newer ones with overall better characteristics, there is no 'best' chemistry. Manufacturers will choose the best compromise based on manufacturing constraints, costs and application requirements.

Table 1 : Lithium-ion battery types

Name	Chemistry	Comments
<b>Iron Phosphate, LFP</b>	$\text{LiFePO}_4$	This is a popular chemistry for heavy duty use, low cost and stationary storage. It is not usually found in small electronics and portable applications due to its lower energy density (Wh/kg). Although part of the lithium-ion family, LFP cells have different operating voltage (2.5V to 3.7V). Care must be taken to use LFP specific chargers for batteries based on this technology.
<b>Lithium manganese iron phosphate, LMFP, LFP</b>	$\text{LiMn}_x\text{Fe}_y\text{PO}_4$	This is a new chemistry that may supersede iron phosphate in the near future. Claims to offer the same advantages but with better energy density. Currently available commercially in 18650 format.
<b>Cobalt, LCO</b>	$\text{LiCoO}_2$	Initial cathode used in the first lithium-ion battery. The industry is moving away from this chemistry as it is less stable (lower safety) and higher cost than NMC and NCA.
<b>lithium manganese, lithium manganate, LMO</b>	$\text{LiMn}_2\text{O}_4$	An early alternative to $\text{LiCoO}_2$ , but it has a smaller gravimetric energy density and less durability at higher temperature. It has been replaced, in most cases, by NMC.
<b>Lithium titanate, LTO</b>	$\text{LiTi}_2\text{O}_5$	In this case, the titanate is used as the anode material. The cathode is NMC or manganese. This is a popular chemistry for heavy duty use and stationary storage. It is not usually found in small electronics and portable applications. It can typically be used at much higher recharge rates and has improved safety over other Li-ion chemistries. Although part of the lithium-ion family, LTO cells have very different operating voltage. Care must be taken to use LTO specific chargers for batteries based on this technology.

Name	Chemistry	Comments
<b>Nickel-manganese-cobalt, NMC, NCM, ... and other permutations depending on the relative ratios</b>	$\text{LiNi}_x\text{Mn}_y\text{Co}_z\text{O}_2$	One of two main types of lithium-ion cells available on the current market. The subscripts x,y,z can be varied by manufacturer.
<b>Nickel-Cobalt-Aluminum, NCA</b>	$\text{LiNi}_x\text{Co}_y\text{Al}_z\text{O}_2$	One of two main types of lithium-ion cells available on the market. The subscripts x,y,z can be varied by manufacturer.

Some experimental batteries or technologies in development are listed in Table 2. These are not available commercially at this time but the terminology may be encountered when researching batteries.

Table 2 : Future batteries

Name	Comments
<b>Lithium air</b>	This battery uses oxygen (or air) as the cathode and solid lithium metal as the anode. It has the potential for higher capacities but present stability (durability) issues and degrades with oxygen impurities.
<b>Lithium metal</b>	The graphite at the anode is replaced with metallic lithium like primary batteries
<b>Lithium sulfur</b>	The cathode is replaced with a sulfur compound and the anode is typically lithium metal. These batteries are used for very high energy density applications (aviation), but have issues with durability and safety.
<b>Solid state lithium</b>	Uses a solid separator such as ceramic along with lithium metal as the anode. Used in high energy density applications and are still in pre-commercial state.

## 2.2 Cell formats

Regardless of chemistry used, battery packs are assembled from cells which are available in four basic battery formats: coin, prismatic, pouch and cylindrical.

Coin cells (ie: watch battery size) are the smallest format and mostly used for research purposes and small commercial devices. With the exception of very small applications (electronics memory backup, watches, hearing aids, etc.), it is unlikely commercial equipment would require coin cell rechargeable lithium batteries.

Prismatic cells are rectangular prism shaped and are available in many manufacturer-dependent form factors. Although possible, it is unlikely portable equipment would use this format due to the additional weight of the cell can. They are typically used for electric vehicles or large scale energy storage.

Pouch cells are available in all shapes and sizes, making them very popular for a multitude of applications, from electronics to electric vehicles. Due to their low weight, they are particularly popular in small portable

devices. Since the pouch is not a structural material, they usually have to be supported and compressed while in application. Furthermore, care must be taken not to damage them during handling. Users are most likely to encounter pouch cells in electronic equipment (cell phone batteries) and devices such as drones and radio controlled vehicles.

Cylindrical cells is one of the most readily available form factor. Although many custom sizes are available, some have become unofficial industry standards. Cylindrical cell formats are usually named by their dimensions. For example, cells of the 18650 format have a diameter of 18mm and a length of 65.0mm. Cylindrical cells are used in many applications, from electric vehicles to grid energy storage and consumer electronics. Individual cells are widely used in vaping devices as well as flashlights, laser pointers and other portable devices. The most readily available formats are 18650, 26650, 20700 and 21700.

## 2.3 Performance metrics and concepts

In this section, the main metrics used to describe the performance of batteries in specification sheets are explained and a brief description of how they are obtained is given. Some concepts are also explained.

### 2.3.1 Capacity or discharge capacity

This is typically presented in Amp-hours (Ah) and represents the amount of electric charges that are stored in the battery. Capacity is related by a scale factor to the SI unit Coulombs and not to be confused with Capacitance. When combining batteries in parallel, the resulting capacity is the sum of the individual components' capacities. When batteries are connected in series, the resulting capacity remains unchanged (assuming batteries of equal capacities).

Care must be taken when using capacity to compare different batteries as it does not take voltage in consideration. For example, a 10Ah 14.8V pack has twice the energy of a 10Ah, 7.4V pack even though they have the same capacity. Furthermore, some manufacturer of low cost power packs add capacity of series connected components as well, resulting in a many-fold overestimation of the actual pack capacity.

The capacity of a battery is obtained under certain conditions (temperature, discharge rate) which may differ between batteries being compared and may not represent the capacity available in a specific application. For higher current and lower temperature, the available capacity will be lower.

As batteries age, both in terms of elapsed time (calendar aging) and usage (cycle aging), the capacity will gradually and permanently decrease. Although not permanent, self-discharge and on-board protection electronics will reduce the state of charge of the battery over time. This should be considered when batteries are stored or used in low power applications for long periods of time.

### 2.3.2 Energy

The energy, or energy capacity, is typically presented in Watt-hours (Wh) and represent the electrical energy stored in the battery. This is related by a scale factor to the SI unit Joules. This is conventionally stated as a calculation of the rated capacity multiplied by the nominal voltage. When combining batteries in series or parallel, the energy of the resulting battery equals the sum of the individual components energy (assuming batteries of equal energy capacity).

The energy of a battery is obtained under certain conditions (temperature, discharge rate) which may differ between batteries being compared and may not represent the energy available in a specific application. For higher current, and lower temperature, the available energy will be lower.

As batteries age, both in terms of elapsed time (calendar aging) and usage (cycle aging), the energy capacity will gradually and permanently decrease. Although not permanent, self-discharge and on-board protection electronics will reduce the state of charge of the battery over time. This should be considered when batteries are stored for extended periods of time or used in low power applications over long periods of time.

### **2.3.3 Discharge rate, current or C rate**

Battery datasheets typically list a maximum discharge rate, which can be expressed as a current (in Amps) or as a C-rate, which is a fraction of the battery's rated capacity in Ah. For example, 0.5C for a 10Ah battery is equivalent to a current of 5A. A maximum rate for short duration (pulse) may also be specified. This will be accompanied by a pulse duration.

Note that the maximum discharge current is not the recommended operating current or the current at which the battery will have the rated capacity or cycle life. Using a battery at the maximum rated current may require special cooling considerations and both the usable capacity and cycle life will be lower than the rated values.

It is also important to keep in mind that most applications draw a constant power. As such, the current drawn from the battery will increase as voltage decreases.

### **2.3.4 Charge rate**

Battery datasheets typically list a maximum charge rate, which can be expressed as a current (in Amps) or as a C-rate, which is a fraction of the battery's rated capacity in Ah. For example, 0.5C for a 10Ah battery is equivalent to a current of 5A. A maximum rate for short duration (pulse) may also be specified. This will be accompanied by a pulse duration.

Note that the maximum charge current is not the recommended operating current or the charge current at which the battery will have the rated cycle life. Charging a battery at the maximum rated current may require special cooling considerations and the cycle life will be lower than the rated value.

### **2.3.5 Cycle life**

The cycle life is the number of charge-discharge cycles a battery can be expected to last before it has degraded to the point where the usable capacity falls below a certain percentage of the initial capacity. Typically, full cycles (between 0% state of charge and 100%) are used and carried out under standard conditions (charge/discharge current, temperature) until the battery has 80% of its initial capacity. The cycle life obtained in practice will be dependent on the application. Typically, the cycle life is reduced through higher temperature as well as higher charge/discharge current. Shallower cycling (ex: between 20% state of charge and 80%) will increase the cycle life.

### 2.3.6 Balancing

In the case where the battery consists of multiple cells in series (all batteries rated for more than 3.7V), an important function of the Battery Management System (BMS) is to ensure cell balancing. This consists of ensuring each series components (single cells or groups of cells in parallel) are at the same voltage at all times. In theory this is assured by each series component being identical but in practice some cells will charge/discharge slightly faster or slower due to variations in capacity.

Since charge and discharge stops as soon as one of the series elements reaches the maximum or minimum voltage, these small variations are compounded over many cycles if balancing is not performed, leading to a gradual reduction of capacity and a narrowing of the operating voltage range.

## 2.4 Hazards to the battery

In this section, the various hazards that can affect the safety and durability of lithium-ion batteries are listed in Table 3. A description of the hazards is also presented.

Table 3 : Hazards to the battery

Hazard	Description
<b>Overcharge</b>	<p>Overcharge consists of raising the voltage of one or more cells of the battery higher than the maximum charge voltage. This leads to irreversible reactions inside the cells (such as electrolyte oxidation and material breakdown) and is imminently dangerous in the form of increased internal pressure and temperature.</p> <p>Most commercially available battery packs will have protection against this however, a low quality or mismatched charger, human error (misidentified cell voltages) as well as bad pack design may cause some cells to be overcharged through lack of protection or unbalancing.</p>
<b>Over-discharge</b>	<p>Over-discharge consists of using the battery until the voltage of one or more of its cells is lower than the minimum voltage. This leads to irreversible reactions inside the battery cells (such as lithium plating). Over discharge is not dangerous in itself but leaves the battery permanently changed and potentially hazardous during subsequent charge, even at rated voltage and current. An over discharged battery must be immediately marked for disposal.</p> <p>Most commercially available battery packs will have protection against this however, human error (misidentified cell voltages) as well as bad design or failure of the balancing circuit may cause some cells to be over-discharged.</p>
<b>Overcurrent</b>	<p>Using the battery at a higher current than rated may cause an internal fuse to fail, leaving the battery permanently disabled. In cases where there is no fuse, a high current may cause the battery to heat up. If sustained, this may lead to venting and thermal runaway of the cells. In mild cases, it may not have immediate adverse effects but will greatly reduce the cycle life of the battery.</p>

Hazard	Description
<b>Over-temperature</b>	Heating a lithium-ion battery, either through use or environmental conditions, past a certain point will initiate an exothermic decomposition of the battery material which may lead to a thermal runaway. This is usually around 120°C but can be as low as 90°C depending on cell chemistry or state of charge. At more moderate heat levels (60°C), the battery will remain safe but its shelf and cycle life will significantly degrade.
<b>Under temperature</b>	Care must be taken to avoid storing the battery below the minimum rated temperature. Material dimensional changes may affect the integrity of the battery's cells and its ability to function. Care must also be taken to avoid discharging and charging the battery below the corresponding minimum rated temperature. The minimum charging temperature is, in most cases, much higher than the discharge temperature due to the nature of the chemical reactions taking place. Note that even if above the minimum temperature, a derating typically applies to the currents that can be used.
<b>Physical damage</b>	Lithium-ion cells as well as the electronic circuits used to protect them are vulnerable to physical damage. Cells that are crushed or punctured may react violently. BMS that are subjected to excessive vibration, shock or physically damaged may malfunction.

## 2.5 Hazards from the battery

There are multiple hazards that a battery may present either due to manufacturing defects, misuse or accidents during handling. These hazards, along with a description, are listed in Table 4.

Table 4 : Hazards from the battery

Hazard	Description
<b>Pressurized content</b>	The content of the cell becomes pressurized as temperature increases. In the event of a short circuit or other fault leading to a temperature rise, the cell may vent a stream of hot gas. If the reaction is too quick, the vent fails to open or becomes obstructed, the cell may burst, catch fire or explode.
<b>Inflammable</b>	The electrolyte in liquid or gaseous form as well as vent gases and gas from thermal runaway in oxygen depleted environments are inflammable. Conditions where these gasses are produced may arise from physical damage to the battery or from events such as short circuit and overcharge.
<b>Chemical</b>	The electrolyte contained in the battery is a volatile corrosive chemical and present an inhalation and contact hazard when released in liquid or gas form. In the event of a thermal runaway, some combustion product gases are corrosive and also present an inhalation hazard as well as a contact hazard if condensed.

---

<b>Hazard</b>	<b>Description</b>
<b>Electrical</b>	Some battery packs can reach voltage that can cause severe bodily harm (50V or more). Care must be taken when storing, manipulating and using such batteries.
<b>Heat/fire</b>	When misused, the battery may reach temperatures that can cause burns. In extreme cases such as thermal runaway with or without flames, it can ignite adjacent combustible material and/or explode.

---

## 3 Use

This section focuses on the use of lithium-ion batteries which consists of charging and discharging in various environments as well as manipulation of the battery and exposure to elements corresponding to its intended use. The hazards to the battery (Table 3) and presented by the battery (Table 4) are discussed in the context of how the battery should be used in the field (3.1) and in the lab (3.2).

### 3.1 In the field

As opposed to storage, disposal or usage in the lab, where the battery is one of the main consideration, the use of lithium-ion batteries in the field presents a different set of challenges. In such cases, the battery is used in support of an application or activity by personnel who may not be aware of particularities of lithium-ion batteries. Furthermore, the environment in which the battery is used is dictated by the application and may present risk to the battery. In this section, some of the risks are identified and possible mitigations are proposed.

#### 3.1.1 Hazards and causes

##### Over current and Short circuit

- In the field, short circuit and over-current can happen a number of ways. Using the battery with a low quality, defective or incompatible charger can lead to charging currents higher than the battery's maximum charge current. Incompatible equipment and defective equipment in particular present a risk of an excessive current draw.
- Handling of the batteries may also cause short circuits in cases where contactors are exposed. In good quality packs, this is typically prevented by the protection electronics.
- Special consideration must be given to individual cells, which are usually of a standard format (such as 18650) and can be found in flash lights, laser pointer and other low power equipment. These will be physically compatible with devices that may draw more than the cell's maximum current. Furthermore, these types of cells have exposed terminal which present a short-circuit risk when they are changed or transported as spares.

##### Overcharge

- Overcharge of batteries is possible when using a low quality, defective, or incompatible charger. Most battery packs have on board electronics that protect the cells from overcharge but these protection circuits may be damaged by a faulty or low quality charger.
- Special attention must be given to loose cells, which are usually of a standard format (such as 18650) and will be physically compatible with chargers that may exceed the cells' charge voltage and current. In particular, LFP cells will be overcharged if used with a lithium-ion charger meant for NMC or other chemistries.

## Over-discharge

- Over-discharge of batteries is possible however, most battery packs have on-board electronics that protect the cells from over-discharge. These protection circuits may be damaged but a good quality charger will not attempt to charge an over-discharged battery pack.
- Special attention must be given to loose cells, which are usually of a standard format (such as 18650) and will be physically compatible with devices that may continue to function below the cells' minimum voltage.
- For devices using multiple single cells in series, care must be taken to ensure they are at the same state of charge and of the same brand, model and energy capacity. Otherwise, there is a risk of over-discharging the cell with the lowest capacity or lowest state of charge.

## Temperature outside of operating range

- Certain applications may expose the battery to environmental conditions outside of the specified storage or operating temperatures. For example, batteries left in a vehicle or dark container in full sun may exceed the maximum temperature. If the battery is in use, the temperature will rise further. A well designed battery will then stop providing power, thus adversely affecting the task in progress while a lower quality battery may allow usage until cells vent. Similarly, a battery left unprotected in winter may be permanently damaged and unsafe to use.
- Possible damage caused by storage outside the temperature range are unlikely to be detected by a charger and, although some battery packs will not allow operation outside the allowable temperature range, they will typically not remember past exposures or be able to detect any damage caused by these events.
- It should be noted that the maximum rated current is not available for the full operating temperature range. A current derating factor has to be applied as the temperature approaches the extremities of the operating range.

## Physical damage and environmental conditions

- Depending on the application, usage of batteries in the field may leave them exposed to physical damage. This includes dropping batteries packs or subjecting them to possible puncture or crushing. Depending on the pack and cell design as well as the severity of the event, this may lead to thermal runaway and violent fires.
- Similarly, exposure to flame, water, salt water, corrosive agents or other environmental factors may affect the health and safety of the battery.

### 3.1.2 Recommendations

#### Use good quality batteries and a good quality charger designed for the battery type

- It is recommended to use the charger that was designed for the battery but in the event the pack or cells are of a standard format (BB-2590, 18650, ...) many chargers will exist.

- When selecting a charger or batteries, consider a brand's reputation for quality products. Avoid cheaper reproductions as they may contain lower quality components.
- Consider the level of integration with the battery. Some chargers will connect to the battery through CANBus or SMBus to monitor its condition more closely.
- For single cell chargers, a dedicated charging channel per cell is preferable to those that charge cells in pairs. Safety features such as temperature monitoring are also desirable.
- Trickle charging is not recommended for lithium-ion batteries.

### **Consider the application and operating conditions when selecting a battery**

- When selecting a battery, look at the application parameters while keeping in mind there may be deratings at the extremities of the operating ranges. Factors to look at are:
  - i) operating temperatures and storage temperature
  - ii) Voltage range and maximum current
  - iii) Cycle life
- When selecting a battery, consider the environmental conditions it will be used in such as
  - iv) humidity
  - v) exposure to water, salt or corrosive agents
  - vi) exposure to heat or flame
  - vii) possibility of falling, crushing or other physical impacts
  - viii) vibration
- When selecting a battery, consider the safety risks to users and equipment in the context of the application (egress time, access to first aid and fire suppression ...). In general, more energy dense batteries provide longer mission times at the expense of more intense reactions in case of failure.
- Consider looking at standards that align with your intended application to simplify the selection task.

### **Label loose cells, associated chargers and battery compartment of compatible devices**

- Avoid using different models of loose cells of the same or similar format. If multiple devices require loose cells, use a cell model that can satisfy the power requirements of all devices if possible.
- In the event multiple models of cells are required, labelling cell types, devices they are used with and chargers (if applicable) will reduce the chance of mistakes occurring. This also applies to non-rechargeable cells. For example, alkaline 1.5V AA, lithium 3V AA and lithium-ion (rechargeable) 3.7V 14500 have the same physical dimensions but are very different batteries.
- Cells of different model should never be used together in the same device.

### **Charge batteries prior to deployment**

- This ensures the batteries are fully topped up before use and confirms that the chargers are functional.
- On critical non-repeatable tasks, it may be desired to charge/discharge a new battery a few times to confirm it is in good working order.

### **Do not leave batteries to charge unattended**

- Ensure someone is in the vicinity of a charging battery to take action in the event a failure occurs.

### **Have a dedicated location for charging if possible**

- Having all charging occur in one location simplifies monitoring and limits the hazards to a defined area which may be better prepared.
- Clear the area of any flammable components.
- Ensure the area is protected from the elements and physical hazards.
- Ensure emergency response equipment is accessible.

### **Wait for batteries to acclimatize before charging**

- Charging a hot or cold battery is not recommended as it may damage the battery or present a hazard to users. Unless explicitly allowed in the operating instructions, wait until the battery reaches room temperature before charging.
- Keep in mind that this may take a significant amount of time for large batteries, especially if they are kept in an enclosure.

### **Discontinue use of malfunctioning equipment**

- If the battery or charger fails, seems hotter than usual or displays other unusual behaviour, disconnect both the battery and charger. Discontinue use until their functionality can be assessed.

### **Remove the battery if a device is damaged**

- In the event a device is damaged, it is recommended to remove the battery if it is safe to do so. This will protect the battery from potential short circuits and avoid exposing it to a fire that may arise from the damaged equipment.
- If there are signs of damage to a device from a swollen, vented or leaking battery, the device should be serviced before being used.

## 3.2 In the lab

Using or working with lithium ion batteries in the lab presents unique hazards in addition to those discussed in 3.1. Although the battery is in a controlled environment, it is possibly being used with limited protection electronics and in ways not intended by the original design.

### 3.2.1 Hazards and causes

#### Over current and Short circuit

- In the lab, the risk of short circuit is greatly increased as exposed cells or partially disassembled batteries are manipulated, possibly with the use of metallic tools and without their protection circuits.
- Furthermore, batteries are connected to experimental and prototype circuits or devices whose protection circuits, if any, is likely not tested with the same rigour as commercial products.
- When building a pack, cells selected at random are possibly mismatched in terms of age, actual capacity or internal resistance even if they are of the same model. If charged in parallel, this could cause lower resistance cells to receive a disproportionate amount of current, possibly exceeding the maximum.

#### Overcharge

- When externally charging a pack where protection circuits are absent or bypassed, a significant amount of responsibility lies with the user's knowledge of the pack and equipment. Cells may be overcharged if the configuration of the pack doesn't correspond to the charge voltage used or if the equipment doesn't behave as expected.

#### Over-discharge

- When discharging a pack where protection circuits are absent or bypassed, a significant amount of responsibility lies with the user's knowledge of the pack and equipment. Cells may be over discharged if the configuration of the pack doesn't correspond to the discharge voltage used.
- Care must be taken when the BMS is powered by the battery. If it is left active, it will discharge the battery over time and may do so to the point where it is over-discharged.

#### Over Temperature

- In the lab this may occur easily when attempting to solder wires to a battery terminal. It may also occur on prototype devices when the heat dissipation has not been appropriately considered. This includes dissipation from the battery to adjacent components as well as from nearby heat producing electronics to the battery.

### **Physical damage**

- In lab environments, the cells, modules or partly disassembled batteries may be more vulnerable to impact if they are manipulated while exposed and outside of their protective housings.

## **3.2.2 Recommendations**

### **Always ensure the work area is non-conductive and free of clutter**

- When manipulating cells or partly disassembled modules and packs, the risk of short circuit increases greatly. Keep in mind that the aluminum case of prismatic or cylindrical cells is often connected to one of the terminals.
- Do not scatter or stack cells. Cells on the work area should be placed in non-conductive carrying trays with individual compartments separating terminals to prevent short circuiting.
- Drape non-conductive isolation blankets over exposed connections of large open modules or packs, and present visible signage of high voltage hazard.

### **Use non-conductive or coated tools when possible**

- Using non-conductive tools (ceramic, plastic ...) greatly reduce the risk of short circuiting the battery.
- If metal tools must be used, reducing the exposed conductive surface of the tool (screwdrivers, cutters, pliers ...) with electric tape or other insulator reduces the risk of short circuit.

### **Always have the appropriate protection equipment**

- In all cases, protective eyewear should be worn along with a flame retardant and easy to remove lab coat. A face shield can provide added protection if required.
- Depending on the work conducted, it may be desirable to have a fume hood connected to the building's exhaust system. This would serve the dual purpose of protecting the user and containing a possible thermal event.

### **Remove jewelry and accessories**

- Accessories such as jewelry and watches may inadvertently cause a short circuit while the battery is being manipulated.

### **Avoid using a battery without the battery management system**

- Charging and discharging a battery for multiple cycles without a battery management system present may lead to overcharge in some cells as cell balancing will not take place and the charge or discharge will not be cut-off when the voltage of individual cells leaves the safe operating range. For example, a lithium-ion battery consisting of two cells at 4.5V and 2V will still show as partially charged (6.5V out of a maximum of 8.4V) even though one of the cells is dangerously overcharged.
- If charging or discharging a battery without a battery management system, the cycler must monitor individual cell voltages and stop the cycling if the voltage is out of the safe operating range.
- If a battery is used to power a custom circuit or prototype, ensure the discharge is stopped, either by the circuit or battery, when any cell reaches the minimum discharge voltage. Also ensure the current supplied by the battery is limited to values below the maximum rated current.
- If a battery is charged by a custom circuit or prototype, ensure the charge is stopped, either by the circuit or the battery, when any cell reaches the maximum charge voltage. Also ensure the current supplied to the battery does not exceed the maximum charge current.

### **Confirm the battery configuration and characteristics before charging and/or discharging**

- When charging or discharging a battery with laboratory equipment, confirm the charge voltage, discharge voltage and current will not exceed those stated in the datasheet.
- In the case the battery is a prototype or partially disassembled, confirm the cell configuration, cell minimum and maximum voltages and cell maximum current. Ensure they will not be exceeded during the process.

### **Use caution when cycling batteries**

- When designing a new schedule to cycle batteries, have a second qualified individual confirm the settings before use. It is important to have the correct values and safety limits if cycling is expected to be performed unattended.
- Monitor batteries for a time when performing automated cycling on a new battery type or using a new schedule to confirm the execution is proceeding as planned.

### **Discharge the battery before undertaking high risk tasks (assembling or disassembling a battery, testing a prototype circuit, ...)**

- Whether it is for disassembly of a pack, welding tabs to a cell, or simply connecting them to a prototype circuit, batteries at low states of charge (0%-30%) are significantly safer.
- In case of high voltage batteries, ensure all service disconnect devices are removed and isolate modules in safe working voltages (less than 50V) first whenever possible.

**Avoid using unprotected batteries in parallel if possible**

- Although this is done in commercial products, there is typically some investigation performed to ensure cells grouped in parallel are of similar age and capacity or that the maximum current of the pack accounts for some variability amongst cells.
- Never mix batteries of different manufacturer or model in the same pack.

**Do not cut more than one wire at a time**

- Cutting wires as a group may short circuit the battery as the cutting tool momentarily touches all wires simultaneously.

**Use proper welding methods to connect wire or tabs to cells**

- It is not recommended to apply a soldering iron to battery terminals. Use a spot welder designed for this purpose or other advanced technologies (ultrasonic, laser and others). The heat of a soldering iron against the terminal is transmitted directly into the battery and may cause a thermal reaction while attempting to work faster to minimize such heating will produce low quality solder joints.

**Add batteries to the system only when required**

- Principles from “just in time” manufacturing can be applied in the lab to reduce the amount of time spent in the vicinity of lithium ion batteries. If possible, use a power supply to power the system during development, assembly and testing. Only take the batteries from storage when they are ready to be used.
- For high voltage batteries, the series connections of the modules and reinstallation of the safety disconnects should be done last.

## 4 Storage

This section focuses on the storage of lithium-ion batteries, which consists of leaving them unattended and unused for extended periods of time. The hazards are first discussed (4.1), followed by how they can be mitigated (4.2).

### 4.1 Hazards and causes

Undamaged lithium-ion batteries at moderate states of charge are unlikely to self-initiate a thermal reaction but some measures must be taken to protect them from external factors to avoid increasing the severity of an unrelated event.

#### Short circuit

- Short circuits may happen in storage across a single battery or a combination of multiple batteries and conductive surfaces if batteries are not physically constrained in the storage space and terminals are left unprotected. Movement of the cells can be caused by handling errors but also unpredictable events such as ventilation and equipment vibrations or earthquakes.

#### Over-discharge

- Although not an immediate danger, batteries left in storage too long may self-discharge below the point at which they can safely be re-charged. This is particularly the case with batteries with BMS or permanently attached to devices which constitute a current drain even when stored. These present a possible hazard if recharged at a later date.

#### Excessive temperature

- High temperature can cause venting of electrolyte from packs/cells, presenting an immediate chemical hazard and may eventually lead to thermal runaway and fire. This can be caused by a thermal runaway in an adjacent battery or by external causes such as a hot storage environment or an unrelated fire.

#### Electrical hazards

- Partially disassembled batteries or modules not designed to be handled individually may present exposed terminals which, depending on voltage, may present a hazard to the health and safety of personnel accessing the storage.

## 4.2 Recommendations

### **Discharge batteries to 30% state of charge before long-term storage**

- Aging of batteries is slower at lower states of charge. Storing them in this state will ensure batteries kept for later use maintain their energy capacity as much as possible.
- Reducing the state of charge of a battery greatly reduces the severity of internal or external short circuit and other failures related to the battery, thus ensuring safer storage. This does not render the cell inert however as it still contains flammable electrolyte and enough electrical energy to heat the surroundings.
- Batteries that are at or below 30% state of charge already meet the state of charge criteria for shipping.
- It is not advisable to discharge the battery too low as self-discharge or battery electronics may over discharge the battery during extended storage.
- Note that in some cases, the manufacturer may recommend a state of charge for storage. In such cases, follow the manufacturer's instructions.

### **Protect battery terminals**

- In the case of commercially available portable battery packs and modules such as power banks and laptop batteries, terminals are usually recessed and thus protected from accidental contact. This is not the case for individual cells and other form factors as well as for modules that have been taken out of their original enclosures. A case or holder providing protection against incidental contact with the terminals is recommended. Alternatively, tape can be used to cover the exposed terminals. This will mitigate the risk of short circuiting batteries in storage as well as reduce the electrical hazards to users.

### **Keep storage area clean**

- In order to prevent short circuits and minimise material that could contribute to a fire, keep the storage area free of other items.
- Do not overfill the storage area. Use an additional cabinet if more space is needed.

### **Implement an inventory management system**

- An inventory management system should be in place to identify the batteries. At a minimum, a battery's type (make and model) and manufacture date should be available. This allows potential users to lookup the specification sheets for more details and facilitates replacement of aged batteries when new ones come in. For convenience, additional information such as charger compatibility, battery configuration, charge voltage/current and other relevant information may be included as appropriate.
- A maintenance schedule should be in place for items stored over long periods to monitor their health and top-off charge as required.

- Batteries that are waiting for disposal, are damaged or are in any way unusable should be kept in a different location if possible and clearly marked as such to prevent their use.

### **Use an appropriate storage environment**

- Care must be taken to create an appropriate storage environment. It is recommended to store lithium ion batteries in a dedicated cabinet.
  - i) The cabinet should be resistant to high temperature. Although there are purpose build cabinets for lithium-ion batteries, flammable liquid cabinets are also a good choice.
  - ii) The cabinet's door should have a latching mechanism to ensure the door remains closed in case of a thermal event.
  - iii) Surfaces should be non-conductive to reduce short circuit risks.
  - iv) Avoid sharp edges to minimize risk of puncturing or tearing pouch cells.
  - v) If possible, the storage cabinet should be connected to your building's fume hood system as venting electrolyte represent a chemical hazard to surrounding personnel.
- Any oxidizers, combustible or flammable material should be kept away from the storage to reduce risk in the event of a fire.
- Cabinet should be kept away from areas that have forklifts or other heavy equipment that may collide with it.
- For EV batteries or large numbers of batteries, it is recommended to store them at least 50 feet from buildings or other flammable entities.
- The location of your storage cabinet should be included in your building's emergency response procedure and documentation.

### **Avoid storing batteries below ambient temperature**

- When batteries stored at low temperature are removed from storage, condensation may form on the batteries which may not be rated for exposure to moisture.

### **Avoid storing batteries in equipment for extended periods of time**

- Some equipment have parasitic loads and drain power even when off. This risks over-discharging the battery.
- Any adverse reaction with the battery also puts potentially expensive equipment at risk.

### **Avoid purchasing too many batteries**

- Having more batteries than required creates unnecessary hazards and increases the storage and maintenance burden.
- Batteries will age and deteriorate even if unused.

## 5 Transportation

This section focuses on the transportation of lithium-ion batteries and discusses the applicable standards and typical recommendations. The information provided here represents general advices and best practices however, the procedures and regulations of the company used for shipping take precedence. Engage with them early to allow for enough time to acquire any packaging materials required and execute their specific pre-shipping protocols.

### 5.1 Hazards and causes

#### Short circuit

- During transportation of batteries, the batteries themselves or other conductive objects are at risk of moving within the packaging, possibly causing short-circuits.

#### Physical damage

- Transport of batteries may expose them to shock and vibration that may not have been considered in their design. This could affect the structural integrity of the battery and adversely affect its safety.

### 5.2 Recommendations

#### Discharge packs and cells to 30% or lower

- Although there is no state of charge limits for small batteries (laptop, ...) as carry-on luggage on passenger flights and a state of charge limit of 50% for ground travel, it is recommended to use the lowest common denominator of 30% (air shipping) when practical for simplicity and increased safety.
- This greatly reduces the severity of internal or external short circuit and other failures related to the battery. This does not render the cell inert however as it still contains flammable electrolyte and enough electrical energy to heat the surroundings.
- It is not advisable to discharge the battery too low as self-discharge or battery electronics may over discharge the battery during shipping.

#### Use rigid outer packaging and individual inner packaging

- Inner packaging separates the batteries from one another. In the case of equipment containing batteries, ensure the inner packaging will prevent accidental activation of the device.

- The use of rigid outer packaging protects the batteries or cells from damage. Preferably, UN approved packaging should be used for new commercial batteries and are required for waste and experimental batteries. These are:
  - i) Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);
  - ii) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);
  - iii) Jerri cans (3A2, 3B2, 3H2).
- Ensure adequate clearance is present between the batteries and the outer packaging to account for possible mishandling.

#### **Ensure batteries will remain in place in the package**

- Use appropriately sized boxes in combination with filling material to ensure batteries will remain in place in the package in the event they are mishandled during transport. This will reduce the risks of potential short circuits and damage to the batteries.
- Care must be taken to avoid crushing the batteries in an effort to secure them. Padding or cushions should be added between the battery and any clamps or straps used.

#### **Use non-combustible material to separate the batteries**

- In case of experimental batteries, it is required to separate the individual batteries with enough non-combustible and non-conductive thermal insulation to protect against the potential heating of one of the batteries.

#### **Verify the state of the batteries received before use**

- Inspect the physical integrity of the batteries and packaging for signs of damage.
- Verify that the battery voltage is within the operating range.

## **5.3 Standards and regulations**

The shipping and importing of lithium-ion batteries in Canada is regulated under the Transport of Dangerous Goods (TDG) act. Lithium ion batteries have the following UN numbers and identifiers for dangerous goods:

UN3480: LITHIUM ION BATTERIES

UN3481: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT

-or-

LITHIUM ION BATTERIES PACKED WITH EQUIPMENT

At a minimum, a UN38.3 certification is required for the transportation of any lithium battery of the above classifications. Care should be taken that providers have this certification for their product. This makes the batteries easier to deploy at a later date and also gives some level of confidence regarding the robustness

of the battery. In some cases, an exemption can be obtained for experimental batteries and small batches however, this comes with additional restrictions and is limited to domestic land and sea transport.

Aside from the UN38.3 certification, batteries shipped must:

- Be accompanied by shipping documentation.
- Be properly contained.
- Have the appropriate dangerous goods markings (caution label, UN classification and cargo aircraft only label, See Figure 1).



Figure 1 : shipping labels

With regards to containment methods for land and sea transportation, Transport Canada’s dangerous goods regulations refers to Packing Instructions from the UN Recommendation. These are

- Packing Instructions P801 (Appendix A1)
- Packing Instructions P910 for prototype and small batch batteries (Appendix A2)
- Packing Instructions P909 or LP904 when transported for recycling or disposal
- Packing Instructions P908 or LP904 when the batteries are damaged

As a general rule, shipping lithium-ion batteries by air is subject to much stricter requirements and prohibited for prototype, defective and damaged batteries, as well as for batteries marked for disposal or recycling. There are further restrictions for passenger flights, where batteries are subject to size limits and can’t be in checked luggage. The International Air Transport Association (IATA) publishes *Dangerous Goods Regulations*, which contains standards for the transport of dangerous goods by air. This is based on the International Civil Aviation Organisation (ICAO)’s *Technical Instructions for the Safe Transport of Dangerous Goods by Air*. Transport Canada’s Dangerous goods policies align with the IATA regulations and Individual shipping company will have their own processes for compliance.

Shipping batteries by sea is usually the method of choice for products obtained outside of Canada and the United States as it is less restrictive and cheaper than aircraft. It is regulated by the International Maritime Organisation (IMO)’s International Maritime Dangerous Goods (IMDG) Code.

## 6 Disposal

This section focuses on the disposal of lithium-ion batteries and discusses the typical recommendations and example of procedures. The information provided here represents general advices and best practices however, the procedures of the recycling company accepting the batteries take precedence. Engage with them early to allow for enough time to acquire any packaging materials required and execute their specific packaging protocols.

### 6.1 Non-abused batteries with known history or visibly intact

This section applies only to batteries that show no sign of malfunction and where it is known that the battery was not physically damaged and its operation conditions did not exceed the rated values.

#### 6.1.1 Hazards and causes

##### Short circuit

- Disposal presents a significant risk of short circuits as mixed types of batteries, some of which have conductive surfaces, are placed in the same container. A short circuit in the recycling container may cause a thermal runaway or heat adjacent batteries.

##### physical damage

- In some cases, especially when disassembling batteries in the lab, cells or batteries in the disposal bin may be vulnerable to tear, puncture or other physical damage. This may cause an internal short circuit or electrolyte to leak.

#### 6.1.2 Recommendations

##### Contact the recycling company before starting the collection of batteries for disposal

- Starting the collection of batteries with knowledge of the disposal requirements will reduce the risk of time consuming repackaging.
- Keep in mind that the recommendations contained in this document may not align with the recycling company's process. Always follow their process to avoid having batteries refused.
- It may be advantageous to consider various recycling companies. Since requirements vary from one company to the next, some may align better with your needs.

##### Seal batteries showing signs of leak, damage or corrosion in a plastic bag

- To avoid potential chemical hazards, it is recommended to seal a battery that shows signs of leaks, damage or corrosion.

### **Arrange for disposal collection at regular intervals**

- Regular collection times prevents batteries marked for disposal from accumulating, thus reducing potential hazards.
- It also limits the amount of time possibly damaged batteries remain in your facility.

### **Use small plastic containers to collect batteries for disposal**

- Keep containers size small. This prevents waste batteries from accumulating for long periods of time.
- Although steel container can withstand higher temperature and are more likely to contain a potential fire, they present a short circuit risk and are vulnerable to corrosion. It is recommended to use plastic containers. If only steel containers are available, line them with plastic bags.

### **Use vermiculite in larger pails**

- It is recommended to add vermiculite to larger pails (e.g. greater than 4 L) of lithium batteries. Use about 3cm on the bottom and add some as the pail is filled. Top off the container with a layer of vermiculite to occupy the empty space.

### **Fully discharge batteries**

- To reduce the risk of thermal runaway, batteries should be fully discharged. This can be done down to the minimum allowable voltage for a battery with protection circuits or to 2.5V or lower for single cells.
- For batteries with complete discharge devices, follow the instructions provided by the manufacturer.
- After discharge, ensure the battery is back to room temperature before adding to the disposal container.

### **Handle with care**

- Ensure disposal is done with care as, even if the battery in hand is robust, the disposal container may contain pouch cells, which are more vulnerable to puncture and tear, or damaged batteries.

### **Tape battery terminals and other exposed steel**

- Use tape (electrical tape preferred) to cover the terminals of the battery. Alternatively, batteries can be bagged individually.
- Ensure that other surfaces through which current could flow (sense wires, bus bars, exposed tabs) are also covered.

## 6.2 Damaged, abused or batteries with unknown history

Damaged batteries present a heightened risk when handled and stored as well as additional hazards. Extra caution should be used when manipulating and storing such batteries.

### 6.2.1 Additional hazards

It is important to note that these hazards are due to the damaged state of the battery and that the hazards of healthy batteries presented in 6.1.1 still apply.

#### Stranded Energy

- Damaged packs or cells may not allow controlled discharge due to protection electronics or passive single action devices (fuses ...). In such cases, the battery energy that is no longer accessible is called stranded energy. Depending on the state of charge, this may greatly increase the dangers of transporting and disposing of the battery.

#### Chemical hazards

- Damaged batteries may leak electrolyte, which is a contact hazard in liquid form and respiratory hazard in vapour form.

#### Fire hazard

- Electrolyte is highly flammable.
- Damaged batteries may have delayed reactions including thermal runaway, sometimes days or weeks after an incident.

### 6.2.2 Recommendations

The recommendations below are for damaged batteries and supplement or supersede, as applicable, the recommendations presented in 6.1.2 for healthy batteries.

#### Dispose of damaged batteries as hazardous waste

- Damaged batteries should not be sent through the used battery recycling or disposal program. Dispose of such batteries a hazardous waste.

#### Wear appropriate protection equipment

- Always wear gloves, eye protection, fire resistant lab coat and safety shoes when handling damaged batteries. Use additional protection (face shield, respirator ...) as required.

#### Discharge the battery if safe and possible

- If it is safe to do so and if the battery protection circuit allows it, discharge the battery in a safe fireproof environment. This will minimize the danger of future safety events.
- Discharge should be done slow (C/20 rate) to avoid generating heat.

## 7 Hazardous Situations and Emergency procedures

This section focuses on emergency situations involving lithium-ion batteries. First, the numerous hazards that may be present in emergency situations are discussed. Then, the various types of hazardous situations and emergencies will be described and, in each cases, recommendations of how to deal with them are presented.

### 7.1 Hazards

#### Burn

- Whether a cell narrowly averts a safety event, vents or goes in thermal runaway, the resulting remains will be hot (100°C – 500°C) and may cause burns.
- In the event of thermal runaway, cells may burst and hot or molten material may be ejected from the battery.

#### Chemical

- Electrolyte contains strong VOC and can cause severe irritations to the respiratory tract, skin and eyes. Avoid exposure to electrolyte in liquid or vapour form.
- In the event of thermal runaway or fire, toxic and corrosive gasses may be generated. These are battery dependant and may include:
  - Hydrogen Fluoride
  - Carbon Monoxide
  - Carbon Dioxide
  - Lithium Hydroxide
  - Thionyl chloride
  - Bromine
  - chlorine dioxide
  - hydrochloric acid
  - sulfur dioxide
  - sulfuryl chloride
  - Other fluoro-compounds
- As a result of firefighting efforts, the following can be generated:
  - Hydrofluoric acid
  - Strongly acidic waste water

- Hydrogen from the reaction with water
- Strongly alkaline waste water

### **Explosion risk**

- The gases resulting from a vent or thermal runaway are flammable and may present an explosion risk as they accumulate in an enclosed space and mix with air.

### **Fire**

- During a thermal event, the battery can reach high temperature with or without flames, which may ignite adjacent combustible material, including other batteries.
- During a thermal event, the cell may burst and eject flaming, molten or hot material thus presenting a fire hazard for surrounding combustible materials.

### **Compressed Content**

- During a venting or thermal event, the cell may burst, sending fragments at high velocity into the surroundings.

## **7.2 General recommendations and first aid**

### **Have proper fire suppression and first aid equipment on hand**

- In case of lithium-ion battery fire, use a fire extinguishing agent that allows the reaction to consume itself while preventing it from spreading, such as water or CO<sub>2</sub>; a Class D extinguisher is also acceptable.
- If other combustibles catch fire as result of the battery fire, use the appropriate extinguishing agent to douse these secondary fires; it is important to address each type of fire with the appropriate extinguishing agent.
- First aid kit should include oxygen, eye wash bottle and supplies to treat burns and electrocution related injuries as applicable.

### **Have lab emergency facilities in line with tests performed. This may include:**

- Emergency shower and eye rinse station. Note that these must follow ANSI standards and provide temperature regulated potable water.
- Fire suppression system (emergency shower head or other) above the experiment.
- A metal pail with lid partially filled with sand to quickly isolate a battery when there is reason to believe it may heat up or react. Lid should cover loosely to prevent pressure buildup.
- Proximity of fire hose and fire extinguisher.

### **Review the Safety Data Sheet or product information sheet**

- Prior to working with a battery, review the safety data sheet or product information sheet so that you are familiar with the steps to take in the event of a release and the hazards posed by this particular battery.

### **Ensure users are aware of risks and procedures**

- Users handling lithium-ion batteries should be aware of the potential hazards presented by the battery and the established procedures to follow.
- Users should be aware of the location of first aid and fire suppression equipment.

### **In case of eye contact with electrolyte, gases, or combustion by-products**

- Immediately flush eyes with a direct stream of water for at least 15 minutes with eyelids held open, to ensure complete irrigation of all eye and lid tissue. Get immediate medical attention.

### **In case of skin contact with electrolyte, gases, or combustion by-products**

- Flush with cool water or get under a shower.
- Removed contaminated garments.
- Seek medical attention if necessary.

### **In case of inhalation of electrolyte, gases, or combustion by products**

- Move to fresh air.
- Get immediate medical attention.

## **7.3 Damaged Batteries**

Batteries that have been damaged through handling (dropping, puncturing, scoring, ...) or shipping as well as battery packs that show signs of damage are at a heightened risk of failure. Internal short circuit caused by damage to the cell are not necessarily immediate and may develop over days or weeks.

### **Discharge and dispose of damaged batteries**

- Batteries that show signs of physical damage should be discharged and disposed of immediately. If that is not possible, the batteries in question should be placed in separate/secure storage where their temperature is monitored and regular visual inspections are done to inspect for changes in health.
- Perform discharge in a vented fireproof enclosure to minimize the risk to surroundings.

## 7.4 Hot Battery

This consist of a battery who's temperature has increased for no identifiable reason or that has reached temperatures outside of its operating range. The battery presents an imminent risk of venting, bursting or going into thermal runaway.

### **Evacuate all personnel from the area**

- As soon as it has been determined that a hot battery situation exists, completely evacuate all personnel from the area. The area should be secured such that no unnecessary personnel enter.
- The area should remain evacuated until the battery has cooled to room temperature.

### **Disconnect the battery from device or short circuit**

- If it is safe to do so before evacuating the area, quickly determine if an external short-circuit is present and remove it as quickly as possible. If this was the cause of the heating, the battery will likely cool back down without further issues.
- When evaluating risk, keep in mind that some cell chemistries may enter a thermal runaway reaction above a certain temperature; thus, a cell may continue to heat up and there may be a cascade to other cells.

### **Dispose of the battery once cooled**

- After the hot battery has cooled to normal temperature, the battery should be removed from the work area using appropriate personal protective equipment. The cell or battery should be carefully prepared, discharged, or destroyed in a controlled manner prior to disposal by someone trained to do so.

## 7.5 Electrolyte leak

This section pertains to the case where a battery is leaking electrolyte. This can happen while the battery remains at room temperature or in a hot cell situation, depending on how much damage was caused to the battery. Note that lithium-ion batteries do not contain much free electrolyte as it is mostly absorbed in the cell material. Very little electrolyte would be present during a leak and it would most likely be detectable by smell.

### **Evacuate all personnel from the area**

- Electrolyte is flammable as well as an irritant for the respiratory tract, skin and eyes. It should not be handled by or around unprotected individuals.

### **Wear appropriate PPE**

- These include eye protection, safety shoes, protective clothing, respirator and insulated gloves.

### **Dispose of battery and cleaning material**

- The battery should be placed in a plastic bag and disposed of as a hazardous waste.
- The cleaning material used to collect the electrolyte should be disposed of the same ways as normal organic solvents.

## **7.6 Cell Venting**

This section relates to the case where a cell in a battery is venting due to excessive internal pressure. At this point, the battery is hot. Venting is the last safety measure before thermal runaway occurs. If the vent fails, the cell may burst. If the venting action is insufficient in counteracting the temperature rise, the cell may go into thermal runaway.

### **Evacuate all personnel from the area**

- The vent gases released are corrosive, toxic and flammable, thus presenting serious hazards to personnel without proper protection equipment.
- Depending on the situation, the cell may still go into thermal runaway, presenting further risk to occupants.
- Keep in mind that in buildings where typical laboratory ventilation is absent, this may affect many sections/floors.

### **Call the fire department and activate building emergency procedures as applicable**

- A battery pack containing a venting cell presents a serious health and safety issue that can potentially escalate in severity.
- In the event the reaction is unplanned and outside of lab containment, it likely presents a risk beyond what is acceptable in typical work environments.

### **Wear appropriate PPE and work in groups**

- In the event trained personnel re-enter the room, they should :
  - wear appropriate protective equipment
  - Never operate alone

Be aware of the hazards and risks as well as the current situation.

### **Apply fire suppression as needed**

- Cooling the battery quickly enough may avoid a thermal runaway and propagation to other cells but this is often impeded by the battery casing.
- One of the main purposes of fire suppression in such case is to prevent secondary fires.
- Vent gasses are highly flammable and may ignite, creating a jet of flames.

- A cell venting is usually at temperatures over 120°C and may continue heating, presenting a risk of ignition for the surroundings.

#### **Ventilate the area**

- Air circulation will be required to dissipate the smell and gasses.

#### **Collect waste**

- The vented battery and cleanup materials should be disposed of as hazardous waste.

## **7.7 Thermal runaway**

Thermal runaway is the most severe of cell failures. It refers to the rapid self-heating of a cell due to the exothermic chemical reaction of the highly oxidizing positive electrode and the highly reducing negative electrode. At this point, the reaction is irreversible and the cell will be consumed. This will likely propagate to the rest of typical portable battery packs.

#### **Evacuate all personnel from the area**

- The vent gases released are corrosive, toxic and flammable, thus presenting serious hazards to personnel without proper protection equipment.
- Flames and extreme temperatures present a serious fire hazard.
- Bursting cells may eject debris and molten metals at high velocity.

#### **Call the fire department and activate building emergency procedures as applicable**

- A battery pack containing a cell in thermal runaway presents an imminent and critical threat to the health and safety of personnel and facility.
- In the event the reaction is unplanned and outside of lab containment, it presents a risk beyond what is acceptable in most work environments.

#### **Apply fire suppression**

- Vent gasses are highly flammable and may ignite, creating a jet of flames.
- A cell in thermal runaway can reach temperatures over 900°C, presenting a risk of ignition for the surroundings.
- One of the main purposes of fire suppression in such case is to prevent secondary fires.
- Cooling the battery quickly enough may avoid propagation to other cells but this is often impeded by the battery casing.

## 8 Conclusions

Lithium-ion batteries provide a convenient, effective and safe way to store energy for a wide range of applications. Their use has increased significantly over the past years and is expected to continue growing in the near future.

As with other energy sources such as fuels and combustible gases, an understanding of the risks posed by lithium-ion batteries and the situations in which they arise is essential for their safe use, transportation storage and disposal. Furthermore, familiarity with the risks and emergency procedure as well as the implementation of preventative measures help mitigate the impact of adverse events when they occur.

## Appendix A : Packaging methods

Appendix A reproduces parts of UN packaging methods for the sole purpose of giving guidance regarding what to expect when shipping lithium batteries. Not only are these regulations are subject to change but individual carriers may have their own policies and regulations.

### Appendix A1 : P801

P801	PACKING INSTRUCTION	P801
<p>The following packaging are authorized, provided that the provisions of <b>4.1.1.1</b>, <b>4.1.1.2</b>, <b>4.1.1.6</b>, and <b>4.1.3</b> are met:</p> <ol style="list-style-type: none"> <li>1. Rigid outer packaging, wooden slatted crates or pallets. Additionally, the following conditions shall be met:               <ol style="list-style-type: none"> <li>a. Batteries stacks shall be in tiers separated by a layer of electrically non-conductive material;</li> <li>b. Battery terminals shall not support the weight of other superimposed elements;</li> <li>c. Batteries shall be packaged or secured to prevent inadvertent movement;</li> <li>d. Batteries shall not leak under normal conditions of transport or appropriate measures shall be taken to prevent the release of electrolyte from the package (e.g. individually packaging batteries or other equally effective methods); and</li> <li>e. Batteries shall be protected against short circuits.</li> </ol> </li>   <li>2. Stainless steel or plastics bins may also be used to transport used batteries. Additionally, the following conditions shall be met:               <ol style="list-style-type: none"> <li>a. The bins shall be resistant to the electrolyte that was contained in the batteries;</li> <li>b. The bins shall not be filled to a height greater than the height of their sides;</li> <li>c. The outside of the bins shall be free of residues of electrolyte contained in the batteries;</li> <li>d. Under normal conditions of transport, no electrolyte shall leak from the bins;</li> <li>e. Measures shall be taken to ensure that filled bins cannot lose their content; and</li> <li>f. Measures shall be taken to prevent short circuits (e.g. batteries are discharged, individual protection of the battery terminals, etc.).</li> </ol> </li> </ol>		

## Appendix A2 : P910

P910	PACKING INSTRUCTION	P910
<p>This instruction applies to UN Nos. 3090, 3091, 3480 and 3481 production runs consisting of not more than 100 cells and batteries, or to pre-production prototypes of cells and batteries when these prototypes are transported for testing [in accordance with Special provision 310].</p>		
<p>The following packaging are authorized provided that the general provisions of <b>4.1.1</b> and <b>4.1.3</b> are met:</p>		
<p>1. For cells and batteries, including when packed with equipment:</p> <ul style="list-style-type: none"> <li>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);</li> <li>Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);</li> <li>Jerri cans (3A2, 3B2, 3H2).</li> </ul>		
<p>Packaging shall conform to the packing group II performance level and shall meet the following requirements:</p>		
<ul style="list-style-type: none"> <li>a. Batteries and cells, including equipment, of different sizes, shapes or masses shall be packaged in an outer packaging of a tested design type listed above provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;</li> <li>b. Each cell or battery shall be individually packed in an inner packaging and placed inside an outer packaging;</li> <li>c. Each inner packaging shall be completely surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat;</li> <li>d. Appropriate measures shall be taken to minimize the effects of vibration and shocks and prevent movement of the cells or batteries within the package that may lead to damage and a dangerous condition during transport. Cushioning material that is non-combustible and non-conductive may be used to meet this requirement;</li> <li>e. Non-combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured;</li> <li>f. A cell or battery with a net mass of more than 30 kg shall be limited to one cell or battery per outer packaging.</li> </ul>		
<p>2. For cells and batteries contained in equipment:</p> <ul style="list-style-type: none"> <li>Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);</li> <li>Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);</li> <li>Jerri cans (3A2, 3B2, 3H2).</li> </ul>		

packaging shall conform to the packing group II performance level and shall meet the following requirements:

- a. Equipment of different sizes, shapes and masses shall be packaged in an outer packaging of a tested design type listed above provided the total gross mass of the package does not exceed the mass for which the design type has been tested;
  - b. The equipment shall be constructed or packaged in such a manner as to prevent accidental operation during transport;
  - c. Appropriate measures shall be taken to minimize the effects of vibration and shocks and prevent movement of the equipment within the package that may lead to damage and a dangerous condition during transport. When cushioning material is used to meet this requirement it shall be non-combustible and non-conductive; and
  - d. Non-combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured.
3. The equipment or the batteries may be transported unpackaged under conditions specified by the competent authority. Additional conditions that may be considered in the approval process include, but are not limited to:
- a. The equipment or the battery shall be strong enough to withstand the shocks and loadings normally encountered during transport, including transshipment between cargo transport units and between cargo transport units and warehouses as well as any removal from a pallet for subsequent manual or mechanical handling; and
  - b. The equipment or the battery shall be fixed in cradles or crates or other handling devices in such a way that it will not become loose during normal conditions of transport.

#### Additional requirements

- The cells and batteries shall be protected against short circuit;
- Protection against short circuits includes, but is not limited to,
  - individual protection of the battery terminals,
  - inner packaging to prevent contact between cells and batteries,
  - batteries with recessed terminals designed to protect against short circuits, or
  - the use of a non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.



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