

Solid Waste Facility

August 2020

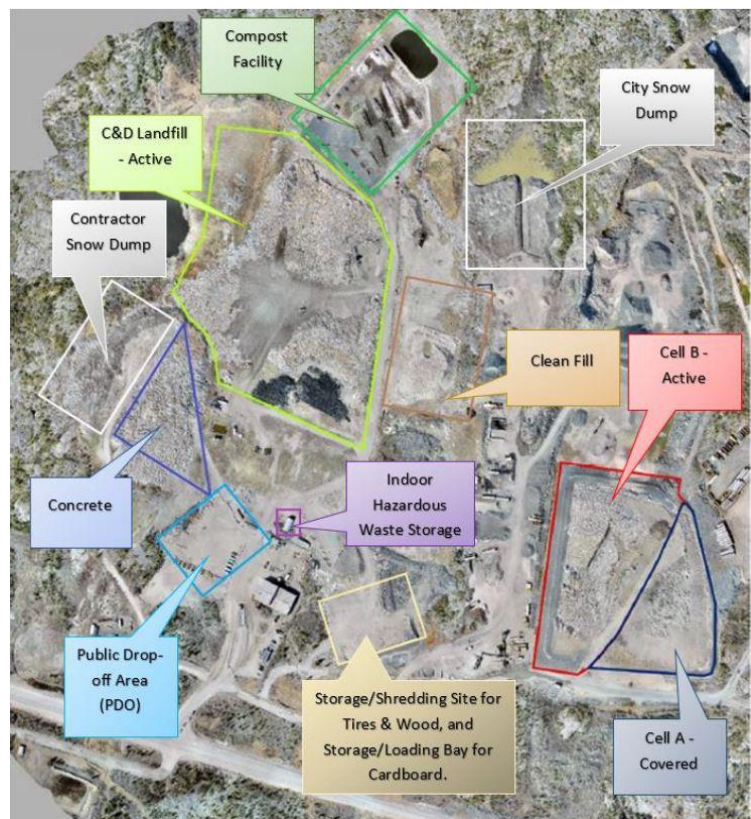
Under the *NWT Waters Act*, the City of Yellowknife requires a licence from the Mackenzie Valley Land and Water Board (MVLWB) to draw water from local water bodies and to deposit waste into the environment. The City is applying to renew its licence. This factsheet is part of a series designed to provide residents and stakeholders with information on the licence application in support of public engagement.

Background

The City's Solid Waste Facility is located at the corner of Highway 3 and the old Highway 4. The entire property is approximately 108 hectares (1,080,000 m²) and consists of the Baling Facility, Landfill, Designated Materials areas, and Compost Facility. There are also five recycling depots located throughout the City.

The facility accepts a variety of materials which include:

- Household materials
- White goods
- Construction and demolition debris
- Animal carcasses
- Tires
- E-waste
- Scrap steel
- Honey bags and pet waste
- A wide range of recyclable materials
- Residential Hazardous waste
- Yard waste
- Uncontaminated snow



These materials are separated and placed in designated areas around the site.

Changes since 2010

In an effort to simplify the drop-off of materials, a drop-off loop was created which includes storage areas for all materials and confines the public to one area of the site. As part of this loop, a designated salvaging area was created in 2010. Each area is clearly marked with signs to delineate the different disposal areas to assist with proper disposal of materials.

In 2020, the three-cell salvage area was replaced by a Public Drop-Off (PDO) area. The PDO is located in front of the Baling Facility with adequate distance for safe traffic flow. The new PDO'S purpose is to have a safe and supervised sorting area for the public while limiting public access to other work zones on site.

In 2009, the City launched a compost pilot project. Building on the success of the pilot project, the program was expanded in 2013 on an area of the old landfill cell that had been closed out. The facility now has the capacity to collect and process organic waste from both the residential and industrial, commercial, and institutional sectors. Construction of the facility was planned in phases and the final phase of construction was completed in 2017.

Other changes since 2010 include:

- Built two Second Generation Landfill Cells (2011 & 2016);
- Expanded Solid Waste Facility Boundary (2015);
- Created a dedicated area for processing of materials (tires, brush, pallets) (2020); and
- Baling facility previously used to process waste and recyclables, but is now only used for recyclables. A compactor is now used to compact waste in each of the active cells (2020).

What the water licence regulates

- Procedures to properly operate and maintain the facilities;
- How the City records the types and quantity of waste received;
- Procedures to monitor and limit impacts on the surrounding environment;
- What hazardous waste is accepted and how it is handled;
- Requirements for approval when planning to expand landfill cells or making modifications at the facility;
- Compost Facility operations;
- Procedures to limit and manage nuisances such as odours and animals;
- Inspections and maintenance requirements to ensure the site is organized, clean and functions as designed;
- Monitoring requirements and locations including leachate, surface water, groundwater and landfill gas;
- Reporting requirements; and
- Plans for closure and reclamation.

What does it mean?

LEACHATE

Leachate is any liquid material that drains from land or materials in a landfill that contains significantly elevated concentrations of undesirable materials.

GROUNDWATER

Groundwater is water that is beneath the surface and flows through soils and/or fractured bedrock.

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Solid Waste Facility Operations and Maintenance

Licence Document: **Solid Waste Facility Operations and Maintenance Manual**

Key points covered include:

- The responsibilities of staff and procedures required to properly operate and maintain the solid waste facility in a manner that limits the impact to the environment and nuisances. These include waste screening, application of intermediate and final covers, prevention of spills, leaks and run-off, leachate management and controls for litter, odour and wildlife.
- Inspection and maintenance requirements to maintain an organized and clean site that functions as designed. These include maintenance procedures for collection, storage, equipment, facility, waste disposal areas, fencing, roads, erosion and sediment control.
- Monitoring requirements, including the operation of the seven Surveillance Network Program (SNP) stations to sample and monitor runoff, seepage and leachate composition. Samples are tested for a comprehensive list of parameters which are outlined in the manual. Results are included in quarterly and annual landfill report.
- Requirement for keeping operational and maintenance records at site, from estimated waste volumes (monthly and annual), to inspection records, to information on maintenance and repairs of equipment and facilities.

Notable updates:

- Information on plans to use evaporation cannons to recirculate leachate into the active waste cells. This is to reduce the overall amount of leachate and to minimize the need to dispose of leachate at the Fiddler's Lake Treatment System.
- An updated list of materials accepted at the facility. The facility is accepting less hazardous waste materials than it has in the past as more are now being handled by private-sector companies.
- Added detail on interim and final covers.
- Updated information on SNP station locations and test parameters.

Future plans include:

- Construction of a new weigh-out scale and replacement of gatehouse;
- Further reduction in hazardous waste accepted (i.e. vehicles); and
- Construction of additional landfill cells.

The design for future expansion will be submitted to MVLWB for approval prior to construction. They will be designed with a liner system and leachate collection system to ensure the cells meet industry standards and minimize impact to the environment and off-site contamination.

Hazardous Waste

Licence Document: **Hazardous Waste Management Plan**

Key points covered include:

- Types of hazardous waste that are accepted and not accepted.
- Information for each type of hazardous waste that describes:
 - Who the waste can be generated by, and accepted from;
 - Applicable regulatory references;
 - Health and environmental risks;
 - Disposal location;
 - Methods of disposal;
 - Transportation requirements;
 - Prevention measures for leaks, drainage, etc.;
 - Expected quantities; and
 - Record keeping, mapping and reporting.
- The methods for managing, handling, and storing the material until the contractor collects it for processing/transportation to an approved facility.
- The tracking system for the date and amount of material received and shipped out.

Notable updates:

- Updated requirements related to the use, inspection, maintenance and labelling of storage containers.
- Updated facility requirements, including safety measures, record keeping and emergency response.
- Updated list of accepted materials. Notably, hydrocarbon contaminated soils are no longer accepted and that treatment facility has been decommissioned as this waste can now be treated by private-sector facilities.
- Updated information for each type of hazardous waste.

Compost Facility

Licence Document: **Compost Facility Operation and Maintenance Manual**

Key points covered include:

- Detailed site information on all components (i.e. base pad, retention pond, water holding tank, fence, storage shed, garbage dumpster, yard waste holding pen and area for source-separated organics are received and processed). Includes information on liner systems used to prevent contamination and migration of contaminants through soils and groundwater.

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- Information on procedures to properly operate and maintain the compost facility in a manner to produce a safe and usable final product, as well as limits the impact to the environment and nuisances. This includes: collection method, feedstock, management of the composting process, managing odour emissions, dust and bio-aerosol control, tracking and monitoring practices.
- Procedures for monitoring and management of leachate and run-off.
- Compost testing at an accredited lab prior to public distribution to confirm that it is safe and free of pathogens.
- Placement and orientation of windrows to optimize drainage and avoid cross-contamination.
- Monitoring, inspection and reporting requirements.
- Procedures to maintain an organized and clean site that functions as designed.

Notable updates:

- The City completely took over operations and monitoring of compost facility from Ecology North in 2020.
- An added Surveillance Monitoring Station.
- Added safety information regarding handling of leachate and hazardous materials.

Closure and Reclamation

Licence Document: **Interim Closure and Reclamation Plan (ICRP)**

The purpose of this document is to take an overall look at the facility and discuss the procedures necessary to prepare areas of the facility that have reach their designed capacity so that they can eventually be closed out while other parts of the facility remain operational.

The ICRP is considered a working document that will be reviewed and revised on an annual basis, if necessary. It provides general description of the closure plan. More specific details will be provided closer to closure.

The main objective of the water licence is to mitigate harmful contaminants from leaving the area and entering downstream water bodies. The long-term closure goal is to minimize impacts on the surrounding environment due to operation of the facility, to return the site to a natural condition, to limit human exposure to waste, and to reduce the generation of leachate.

Key points covered include:

- The methods to meet closure goals are to: have a well-designed and managed site; have regular environmental monitoring of the facility and surrounding area; have regular inspections of the cap to confirm its integrity; and, take remedial actions when necessary.



- Progressive capping will be used. The final cover system will be determined closer to closure to take advantage of the latest technology advances. The purpose of the final cover is to cover waste and provide aesthetics, to limit leachate generation and contamination, to limit wind and water erosion, and to control the release of landfill gas. Covers typically consist of a clay barrier or geomembrane liner and are normally graded to promote drainage away from the landfill cells and prevent ponding while maintaining slope stability and safety.
- Currently, the facility surface water flows south and east and eventually enters Jackfish Lake, Great Slave Lake, or Fault Lake. The intended capping of the site should not significantly impact the overall drainage, but further evaluation of site drainage will be completed as cap designs are finalized.
- Environmental monitoring will be conducted during operation, at closure, and for 25 to 30 years after closure. This will include monitoring of leachate, surface water, groundwater and landfill gas.
- There are nine landfill gas monitoring wells at the moment. Gas monitoring with alarms will be implemented at the baling facility and additional monitoring methods will be investigated.
- An Environmental Site Assessment will be completed at the time of final closure of the Solid Waste Facility to identify if there is contamination at the site, as well as the nature and extent of the contamination. Soils sampling and analysis will be conducted. Remedial measures will be dependent on the nature and extent of contamination.
- There is limited guidance for landfill closures in the NWT. Legislation from BC, Alberta and Ontario were used.
- The plan contains an implementation schedule as an appendix.

Groundwater monitoring

Licence Document: **Solid Waste Facility Interim Groundwater Monitoring Plan**

This document describes the hydrological setting and potential sources of contamination and details the City's groundwater monitoring program, including:

- Sampling frequency and procedures
- Environmental water quality analysis requirements
- Quality Assurance and Quality Control protocols

Key points covered include:

- The City has 9 active groundwater monitoring wells. Three new wells were installed in 2018 to assess potential contamination off-site.
- Potential sources for contamination include: main active landfill area, hazardous waste storage area, off-site roads

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- Water sampling is done in the summer and fall. Sampling parameters were updated based on Alberta regulations and will be implemented in 2022.
- There are no site-specific or territorial groundwater quality guidelines at this time. The City is currently gathering 3 years of groundwater data to determine site specific guidelines, using the Alberta Guidelines and Codes of Practice as reference materials.
- Quality Assurance and Quality Control is achieved through training, the use of an accredited laboratory, consistent data management and quality field sampling and handling procedures.

Notable updates:

- Groundwater Monitoring Plan reviewed by third party consultant.
- Interim Groundwater Monitoring Plan developed.
- Drilled and constructed three monitoring wells downgradient from the site to assess potential offsite contamination.
- Planning for quality trend analysis to determine criteria.
- Internal monitoring and sampling procedure developed.

General and Inorganic Parameters
pH, total dissolved solids (TDS), alkalinity, specific conductivity, hardness (CaCO ₃), bicarbonate, carbonate ¹
Nutrients
Ammonia, nitrate-N, nitrite-N, total kjeldhal nitrogen (TKN)
Major Ions
Chloride, calcium, magnesium, sodium, potassium, sulphate
Dissolved Metals
Arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, molybdenum, mercury, nickel, phosphorous, silicon, silver, strontium, thallium, tin, vanadium, uranium, zinc
Other Organics
Dissolved organic carbon (DOC)
Volatile Organic Carbons²
Benzene, toluene, ethylbenzene, and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs) F1 and F2, methylene chloride, vinyl chloride, trichloroethylene (TCE), tetrachloroethylene (PCE)

Have questions or comments?

The City will be posting more information on each of the components of the water licence renewal at www.yellowknife.ca/WaterLicenceRenewal and will be soliciting feedback from interested residents and stakeholders via email, letter and our online engagement tool [PlaceSpeak](#).

Additional details on engagement opportunities will be provided in the weekly Capital Update and via Twitter and Facebook.

Questions related to the renewal process can be directed to Madison Warren, Municipal Engineer at waterlicence@yellowknife.ca.