Operation & Maintenance Plan for Naujaat Municipal Water Licence: Solid Waste Disposal Facilities 2023

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1.0 Site Description

Date this plan was prepared: June 5, 2023

1.1 Location of the Solid Waste Disposal Facility (SWDF)

Municipality:	Naujaat
Latitude:	66°32’57” N
Longitude:	86°14’41” W
Proximity to Town:	2.0 km North
Landfill Dimensions:	Undefinied
Metal Waste Area Dimensions:	Undefined

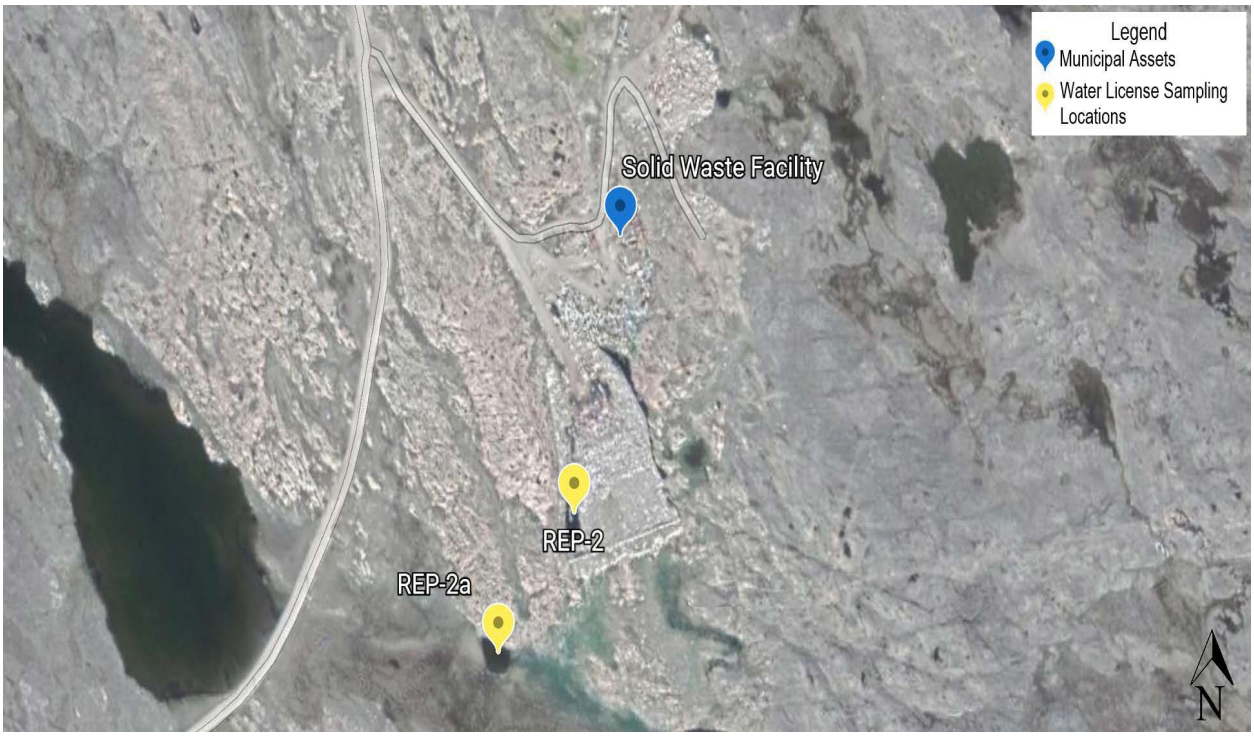

Figure 1 Naujaat Solid Waste Disposal Facility

1.2 SWDF Site Summary

Year of commissioning the SWDF: 2004

Overview:

The solid waste management facility includes:

- Landfill
- Bulky Metal Area
- Hazardous Waste Storage Area

The solid waste management facility is operated under Nunavut Water Board licence number 3BM-NAU2233, which expires on March 7, 2033. The current landfill is located about 2.0 km north of Naujaat. There is no documentation of the original design of the site and no as-built drawings exist. The existing site was constructed in 2004.

2.0 Staff

Role:	Senior Administrative Officer	**Name:**	Sandra Clark
Phone:	867-462-9952	**Email:**	saonaujaat@qiniq.com

Responsibilities: The SAO manages the municipal staff to ensure that:

- proper operation of the SWDF is carried out
- sampling and inspections are completed
- annual reporting to the Nunavut Water Board (NWB) is prepared by the Government of Nunavut Department of Community and Government Services (GN-CGS)

Role:	Foreman	**Name:**	Katelyn Kusugak
Phone:	867-462-9952	**Email:**	N/A

Responsibilities: The foreman is responsible for:

- daily operations and maintenance of the SWDF
- managing waste collection
- proper segregation of waste
- compacting and burning of waste
- completing inspections and other maintenance activities
- The leachate sampling program at the monitoring stations
- maintaining signage at the SWMF and monitoring stations

Role:	Solid Waste Truck Drivers	**Name:**	Various
Phone:	N/A	**Email:**	N/A

Responsibilities: The drivers collect solid waste within the municipality from storage containers and deliver it to the SWDF.

3.0 Health and Safety

All personnel working within the SWDF must follow the *Nunavut Safety Act* and be made aware of potential health hazards associated with working around solid waste. This is imperative so individuals make a conscious effort to perform all necessary safety procedures to protect themselves, their co-workers and family members at home. Safety precautions include:

- Ensure all equipment is kept as clean as possible
- Protective clothing such as coveralls, gloves, boots, and safety glasses are to be provided to personnel and always worn when working around waste
- Workers must always wear protective gloves
- Work clothing is not worn home
- Workers must wash their hands with soap and water on a regular basis, especially before delivering drinking water, eating, and before going home
- Workers must keep their vaccinations up to date

4.0 Security and Control

Access Control of to the facility:

- Perimeter fencing around the SWDF
- Signage
- 450 m restricted land use development setback surrounding the SWDF

5.0 Facility Operations

5.1 Municipal Waste Disposal

Municipal waste collection:	Trucked pick-up
Other waste:	Drop-off
Number of days per week waste is collected:	5
SWMF Type:	Natural attenuation

Type of waste received at the SWMF:

- MSW
- Bulky metal waste
- Hazardous

Overview of the SWDF:

Waste is accepted from within the community, including domestic waste, metals, wood, fuel, and batteries (to be contained and sent off site for proper disposal). Commercial and industrial waste that is not considered hazardous is also accepted.

The site does not have a liner, therefore only uses berms and natural attenuation of landfill leachate. Small amounts contaminate leach from the waste and enter the natural environment. In a natural attenuation landfill the discharge of contaminants is expected to occur at a rate that can be attenuated (broken down & diluted) by the natural environment. The design also relies on permafrost gradually migrating into the waste as it is covered over. Sample locations REP-2A and REP-2 monitor impacts from the solid waste site on the immediate surrounding environment.

If the material meets the industrial land use criteria for disposal in the landfill, it is landfilled. If not, it must be stored as hazardous waste. Currently there is no land farm, and contaminated soils that are not acceptable at the SWMF are contained and shipped south for disposal.

Operations:

1. The SWDF needs to be properly signed to inform operators and residents of the correct location to dispose of or store certain wastes. At a minimum, the SWDF

should have disposal/storage areas for:

a. Domestic non-burnable waste (for landfilling)
b. Hazardous waste
c. Bulky Metal waste
d. Domestic burnable waste

2. The waste truck driver collects municipal solid waste (MSW) from community buildings five times per week.

3. The compactor truck will be tipped into the SWMF. The driver should then complete an initial inspection of the waste pile to ensure it does not contain any hazardous wastes.

4. Any hazardous waste should be diverted to the appropriate disposal areas. The municipality must segregate and store all hazardous waste within the SWDF in a manner that prevents the deposit of deleterious substances into any water, until such a time that the materials have been removed for proper disposal at an approved facility.

5. Any materials requiring disposal in the bulk metal waste area should be transported there. Staff should inspect the area on a regular basis to check for new materials. Fluids (oil, antifreeze) should be drained from vehicles; batteries should be removed, packaged properly, and transferred to the hazardous waste storage area. Vehicles should then be tagged to indicate that they have been inspected and cleaned. Bulky metals can be grouped into materials such as appliances, bicycles, ATV's, snowmobiles, and miscellaneous materials.

6. Reusable/recyclable materials (e.g. wood) should be transported to the salvage area of the SWDF. Salvaging of materials will only be supported in the designated area due to public health and safety concerns.

7. Burning of combustible waste should only occur in the designated area. A description of burning operations is described in section 5.2.

8. At least twice per month, the CAT bulldozer should be used to push the collected MSW pile over the edge of the landfill tipping face and spread out the MSW. The waste should be worked upslope gradually, to a maximum 3:1 grade. The CAT loader should drive over the waste pile at least three to five times to ensure it is packed down and the 3:1 grade is achieved.

9. The waste mound should only be allowed to reach two metres high. Annually, or once the waste mound is approximately three metres wide, the waste mound should be covered with 0.3 m of granular material and packed down to form a covered waste cell.

The estimated volume of household solid waste generated is 6.15 m3/per capita/year, while the estimated generated volume of bulky and scrap metal is 3.16 m3/per capita/ year.

5.2 Open Burning

Operations:

1. Wastes for burning are identified and separated. Burning should only occur at the designated location at the SWDF and when winds are light and blowing away from the community. To prevent incomplete combustion and/or leachate from contaminated ash residual from impacting any surrounding waters, waste that cannot be burned includes:

    a. Non-wood building / construction materials (e.g. Styrofoam, roofing materials, electrical wire, insulation, plastics, asbestos, etc)
    b. Treated wood (e.g. telephone poles, pilings, cribbing, foundation wood)
    c. Asphalt & asphalt products
    d. Tires
    e. Hazardous wastes
    f. Waste paint
    g. Fuel & lubricant containers
    h. Aerosol cans & other compressed gas containers (e.g. propane tanks)

2. Staff shall burn municipal waste in accordance with the GN's Environmental Guideline for the Burning and Incineration of Solid Waste (2012). The Municipality will also apply for a permit to burn through the Fire Department. Controlling the open burn is extremely important to reduce the risk of uncontrolled fire and hazards to the public, employees, and the surrounding environment.

3. The weather forecast must be checked prior to any burning. If heavy rain is or will be present, burning should be postponed (burning during heavy rain events may result in poor or incomplete combustion and the potential to generate harmful contaminants). Confirmation of wind speed and direction prior to any burning. If loose debris can be carried by the wind, burning should be postponed.

4. The SWDF must be closed to the public during burn events

5. Burning only in the designated burn area and ensuring burning does not occur in landfill piles.

6. Presence of an attendant during initial stages of the burn and periodic inspection of the burn once it has been established.

7. Maintaining a minimum of 5 m buffer zone around the burning area and all ensuring attendants or personnel remain upwind of the burn area.

8. Confirmation the waste is no longer hot or burning prior to the addition of more waste or covering with granular material. This can be accomplished by moving around the ash and remaining materials to ensure the fire is out and material can cool.

After every burn, once the MSW is confirmed to be cold and not burning, the CAT bulldozer should push the ash and remaining material to the landfill tipping face.

5.3 Hazardous Waste Management

Hazardous wastes are those that are known to be dangerous due to their chemical, physical or biological properties, are no longer used for their original purpose, and are intended for recycling, treatment, disposal or storage. All hazardous wastes require special handling, storage and disposal methods to prevent human health and environmental exposure.

The Environmental Guideline for the General Management of Hazardous Waste (GN, 2010) provides information regarding the proper management of hazardous waste in Nunavut. The generator of any hazardous waste is ultimately responsible for ensuring it will be properly managed from is creation to its disposal. Generators typically use carriers to transport the hazardous waste to appropriate receivers for disposal.

Naujaat's SWDF is only licensed to accept MSW for disposal and shall only accept household hazardous wastes for storage. Industrial hazardous wastes shall not be accepted for storage or disposal. Industrial sources (generators) are responsible to manage their own hazardous wastes. The estimated volume of hazardous waste generated is 0.62 m3/per capita/year.

The following hazardous waste operations and maintenance procedures deal with household hazardous wastes (HHW) only. Typical HHW which may be found in Naujaat include:

- Pesticides and herbicides
- Paint
- Solvents (e.g. paint cleaners)
- Flammable liquids
- Corrosive cleaners
- Batteries (wet and dry cell)
- Used fuel and oil
- Corrosive Explosive Flammable Poison
- Certain items considered HHW cannot be stored at the MSW disposal facility however. These include:
    - Ammunition, flares and explosives (including fireworks) – contact the Naujaat RCMP for proper disposal
    - Prescriptions, medications and bio-hazardous wastes (includes syringes) – dispose of these at the Nursing Station and/or Health Care Centre
    - Reactive chemicals – contact the GN-DOE office for disposal options

Contaminated soil can be accepted in a designated area and is typically stored in 205 L steel drums or bags approved for contaminated soil storage and must be shipped out of the municipality. Private entities responsible for creating the contaminated soil must contact the SAO to discuss storage options and provide a plan to ship the contaminants out of the municipality. The decision to store contaminated soil from industrial sources rests with the municipality.

The Solid Waste Management for Northern and Remote Communities Planning and Technical Guidance Document (ECCC, 2017) provides recommendations for secondary storage of hazardous and special wastes:

- Design for receiving and short-term storage should include a flat impermeable surface (e.g., HDPE liner) with secondary spill containment appropriate to the type of hazardous and special waste.
- For processing and longer-term storage, liquids should be stored with secondary spill containment, such as bermed liners adapted for northern conditions, or covered structures equipped with a double floor for drainage.
- Mercury switches should be stored in closed unbreakable containers in a secondary container to reduce the risk of releases. Keep separate from other waste, in a cool dry place, and mark with a clear warning sign.

- For filter disposal, eliminate as much waste oil as possible, puncture the top of the filter, set the filter in a tray and let it drain for 24 hours. Crush the filter to increase waste oil recovery. Once finished, place the filter in a storage area. Ideally, filters will be put in an area with secondary containment, which could include bulk bags for filter disposal or plastic bins.

Operations:

1. The SWDF needs to have an area set aside as a hazardous waste storage area. This area also needs to be properly signed as the “Hazardous Waste Storage Area” and should have appropriate storage options for expected waste. Proper signage helps operators, as well as the general public when residents arrive to dispose of their wastes. This area is intended for storage only, not disposal. It is expected that hazardous wastes will be stored for up to five years. This should be sufficient time to build up enough waste to make it economical for a back haul out of the community to a licensed waste receiver.

2. Since the SWDF is generally accessible to the public, residents can come and drop off HHW throughout the year. However, the general public should not have direct access to the Hazardous Waste Storage Area for health and safety reasons. A designated public drop-off area for HHW should be used. The public drop-off area should be tended to regularly by the Foreman.

3. Inspection of the hazardous waste storage area should occur weekly inspections by the Foreman.

6.0 Maintenance

Overview of Maintenance Activities:

1. GN-CGS is currently undertaking a project to identify the type of inspection, frequency of inspection, and the appropriate professional with the specific training to undertake the inspections for assets authorized under the municipal water license. These inspection reports and recommendations will be reviewed by a GN-CGS municipal engineer and submitted in the Annual Report submitted to the Nunavut Water Board (NWB).
2. Regular visual inspections by municipal staff of the:

- Berms

- Fence
- Signage
- Presence of water runoff in the SWDF

  Any issues identified by municipal staff must be reported to the regional municipal engineer. Follow-up actions will be undertaken by the municipality with support from the GN-CGS.

3. Geotechnical inspection of the berms by a qualified engineer as outlined in the municipal water licence.

7.0 Monitoring

Regulatory Inspection:

GN-CGS is currently undertaking a project to identify the type of inspection, frequency of inspection, and the appropriate professional with the specific training to undertake the inspections for assets authorized under the municipal water license. These inspection reports and recommendations will be reviewed by a GN-CGS municipal engineer and submitted in the Annual Report submitted to the Nunavut Water Board (NWB).

Table 1 Water Licence requirements related to O&M of the SWDF

Requirements	**Reported**
A summary of modifications and/or major maintenance work carried out on the SWDF	Proposal submitted to NWB 60 days prior
A list of spills and unauthorized discharges	Annual report submitted to NWB
A summary of any studies requested for the SWDF, and future planned studies planned	Annual report submitted to NWB
Monitoring Program Stations REP-2, REP-2A and REP-5 must be sampled monthly during periods of observed flow. Samples shall be analyzed for the parameters listed in the water licence.	Annual report submitted to NWB

Table 2 Monitoring Program Station description and locations

Station	Description	Latitude	Longitude
REP-2	Runoff from the Solid Waste Disposal Facility culvert	66° 32’ 50”	86° 14’ 14”
REP-2A	Runoff from the Solid Waste Disposal Facility boulder seepage	66° 32’ 48”	86° 14’ 47”
REP-5	Effluent discharge and run-off from the Contaminated Soil Storage Area (controlled discharge)	66° 31’ 47”	86° 13’ 37”

8.0 Surface Water Management

At some point, for a variety of reasons, impacted water may accumulate in the landfill, hazardous waste storage area, or the bulky metals area. The water may or may not be impacted by leachate, hazardous wastes, or contaminants from land farmed soil. In the event this occurs, the following procedures will be followed:

1. Collect samples from the water licence monitoring program at stations as outlined in the Environmental Monitoring Program and QA/QC Plan. It is recognized that it may take some time for results to be received from the accredited laboratory.

2. Analyze samples for parameters of concern and compare the results to the relevant Canadian Water Quality Guidelines.

3. Water should be inspected for odours, stain, or signs of visible impact (sheens, floating scum).

4. Consult with the GN-CGS municipal engineer and CIRNAC on discharge options.

9.0 Modifications and Upgrades

Modifications or upgrades needed for the SWDF: No

Planned modifications or upgrades: None