

Operation & Maintenance Plan for
Coral Harbour Municipal Water Licence:
Solid Waste Disposal Facilities
2021

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1.0 Site Description

Date this plan was prepared:

June 30, 2021

1.1 Location of the Solid Waste Disposal Facility (SWDF)

Municipality:	Coral Harbour
Latitude:	64° 09' 48" N
Longitude:	83° 11' 40" W
Proximity to Town:	2.5 km North
Landfill Dimensions:	160 m x 130 m
Metal Waste Area Dimensions:	Undefined

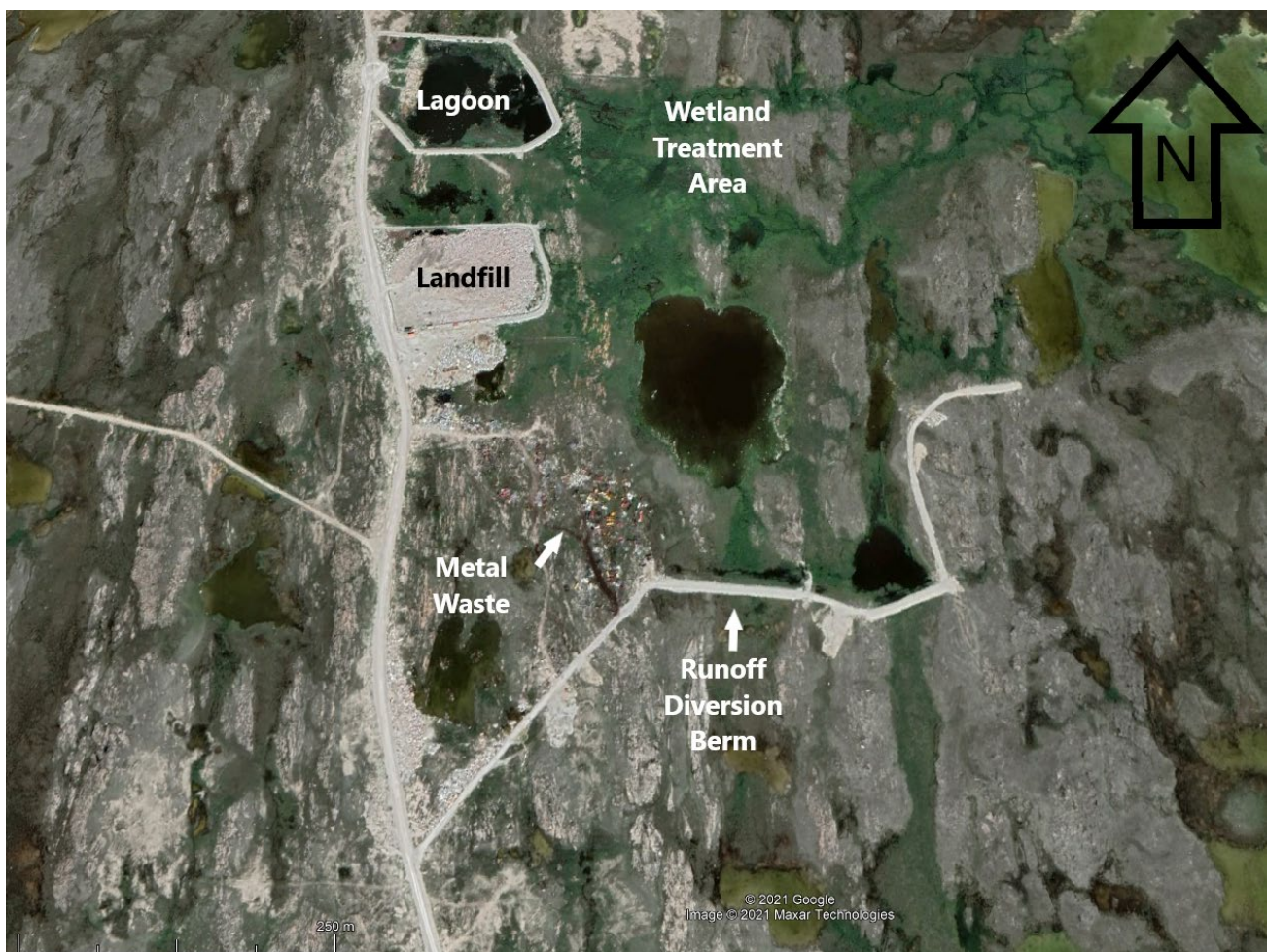


Figure 1 Coral Harbour Sewage and Solid Waste Disposal Facilities

1.2 SWDF History

Year of commissioning the SWDF:

Unknown (Prior to 1980)

Overview:

Coral Harbour's primary solid waste disposal facility consists of a fenced and bermed disposal area for municipal solid waste (MSW) and a separate bulk metal disposal area immediately south of the bermed area.

The municipality collects waste from community buildings five times per week with a compactor truck and transports the waste to the SWDF, located 2.5 km northeast of the community. The SWDF is situated adjacent to (south of) the sewage lagoon and wetland treatment area.

The SWDF is unlined, and a culvert is located within the east berm of the facility allowing water to drain to the tundra wetland. Open burning of MSW is practiced within the SWDF when approved in advance. The municipality must give 10-days' notice, to the Crown Indigenous Relations and Affairs Canada (CIRNAC) inspector, as dictated by the Nunavut Water Board (NWB) water licence.

2.0 Staff

Role: Senior Administrative Officer
Phone: (867) 925-8870

Name: Leonie Pameolik
Email: munch@qiniq.com

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

- proper operation of the SWMF is carried out
- sampling and inspections are completed
- annual reporting to the NWB is submitted with the support of the Government of Nunavut Department of Community and Government Services (GN-CGS)

Role: Foreman
Phone: (867) 925-8323

Name: Darryl Nakoolak
Email: foremanch@qiniq.com

Responsibilities: The foreman is responsible for:

- daily operations and maintenance of the SWMF
- 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:	Collection 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 SWM
- 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
- Industrial, construction and institutional

Overview of the SWDF:

The earliest reports on the current SWMF are from 1981 and it is likely that this location has been used for solid waste disposal for many years prior to that. The area is fenced however the municipality does not have a dedicated operator to control who disposes of waste, where, when, what or how much is disposed daily. The foreman manages the site to ensure proper waste segregation as it is imperative to the long-term operation of the facility and to ensure potential human health and environmental hazards are minimized. This includes diverting un-compactable wastes (e.g. bulky metal wastes) out of the landfill, properly managing hazardous wastes, and overseeing waste re-use and recycling.

The Coral Harbour SWDF is not an engineered landfill and relies on natural attenuation of contaminants that may enter the surrounding environment. In this type of landfill, the rate that

contaminants enter the environment is expected to occur at a rate such that contaminants can easily be broken down and the surrounding environment is not overwhelmed. Natural attenuation landfills also rely on permafrost aggrading into the covered waste cells of the landfill and eventually freezing them. However, as contaminants can freely enter the environment in this type of landfill, proper waste segregation is important to ensure harmful contaminants are kept out of the landfill.

Initial waste segregation should begin at the municipality's residences and other buildings, ensuring residents and business are familiar with acceptable wastes for the SWDF. Household hazardous or bulky wastes need to be kept out of the landfill and transported to the appropriate disposal storage locations.

The waste truck driver should monitor the waste they collect from community buildings every day, collecting only that which is acceptable for disposal at the SWDF. The municipality does provide a 'grace' day once per year to collect residents' household hazardous and/or bulk metal waste. The municipality will also provide help to residents who have larger items to dispose of and have no means of transporting them to the correct disposal area. The waste truck driver should be familiar with operational procedures for the SWDF.

Waste Generation:

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Household Solid Waste	Household waste, small metal waste, tires, electronics, paper, wood, etc.	6.15 m ³ /capita/year	Compact and cover with granular material	Collection from household bins and drop-off at solid waste site
Hazardous Waste	Batteries, paint, antifreeze	0.62 m ³ /capita/year	Segregate from household solid waste	Store in sea cans, batteries in lined battery boxes
Bulky Items/Scrap Metal	Auto body parts, snowmobiles, atvs, appliances	3.16 m ³ /capita/year	Segregate from household solid waste	Compact and cover with granular material
Contaminated Soil	Hydrocarbon contaminated soil	Based on spill events	Store in container until backhaul	Backhaul

Monthly and annual quantities can be calculated from the above generation rates.

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 MSW from community buildings five times per week. The modified compactor truck has estimated weight capacity of 2300 kg and is used to collect and transport municipal waste to the SWDF.
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.

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:
 - Non-wood building / construction materials (e.g. Styrofoam, roofing materials, electrical wire, insulation, plastics, asbestos, etc)
 - Treated wood (e.g. telephone poles, pilings, cribbing, foundation wood)
 - Asphalt & asphalt products
 - Tires
 - Hazardous wastes
 - Waste paint
 - Fuel & lubricant containers
 - Aerosol cans & other compressed gas containers (e.g. propane tanks)
2. The municipality shall provide a minimum of ten days' notice to the CIRNAC inspector of the intent to open burn municipal waste in accordance with the GN's Environmental Guideline for the Burning and Incineration of Solid Waste (2012). The notice should include the details of the types and quantity of waste to be burned, proposed dates, and protocols to be followed. 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.
9. 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 its creation to its disposal. Generators typically use carriers to transport the hazardous waste to appropriate receivers for disposal.

Coral Harbour'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 following hazardous waste operations and maintenance procedures deal with household hazardous wastes (HHW) only. Typical HHW which may be found in Coral Harbour 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 Coral Harbour 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.

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. Annual inspections will be undertaken by Crown Indigenous Relations and Affairs Canada (CIRNAC) accompanied by a licensee and/or a licensee representative from GN-CGS. The inspection report 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: The annual CIRNAC inspection will take place accompanied by the licensee and/or with a licensee representative from GN-CGS. The inspection report will be reviewed by a GN-CGS municipal engineer and submitted with the annual report.

Table 1 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 Station COR-6 and COR-7 must be sampled once per month in June, July and August, during periods of observed flow. Samples shall be analyzed for the parameters listed in the water licence as well as TPH (Total Petroleum Hydrocarbons), PAH (Polycyclic Aromatic Hydrocarbons) and BTEX (Benzene, Toluene, Ethylbenzene, Xylene).	Annual report submitted to NWB

Table 2 Monitoring Program Station description and locations

Station	Description	Latitude	Longitude
COR-6	Run-off from the Solid Waste Disposal Facility	64° 09' 43" N	83° 11' 38" W
COR-7	Run-off below Waste metals area	64° 09' 38" N	83° 11' 33" W

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 COR-6 and COR-7 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:

None identified

Planned modifications or upgrades:

None

10.0 Previous Reports

- Water, Sewage and Solid Waste Operations & Maintenance Manual, Coral Harbour, NU, Nunami Jacques Whitford Limited, 2010
- Coral Harbour Sewage Lagoon and Solid Waste Site Improvements, Ferguson Simek Clark, 2002