ATTACHMENT 51

North 40 Landfill and Waste Transfer Station O&M Manual

Rev 1
April 24, 2026

DILLON CONSULTING

CITY OF IQALUIT

Operations and Maintenance Manual

Landfill and Waste Transfer Station

August 2022 | 19-9543 – Version 6.0

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1.0 Introduction

1.1 Background

The City of Iqaluit (City) is in the process of implementing its Solid Waste Management Strategy to service their near and long-term (75 years) municipal solid waste disposal requirements. Founded on a previously completed conceptual design and facility siting exercise, key elements of the project include a solid waste transfer station (WTS) within the immediate urban area of the City, where residential and commercial waste will be hauled to, processed, and compacted in bales, or in the case of waste wood and cardboard, shredded for use as a fuel source for an on-site biomass boiler. Tires, metal, and some construction and demolition (C&D) wastes will also be shredded and/or baled for landfilling or transported south for recycling. The resulting solid waste bales and possibly a smaller amount of unbaled C&D waste will be trucked to an engineered balefill landfill site (Landfill) located approximately six kilometres from the WTS.

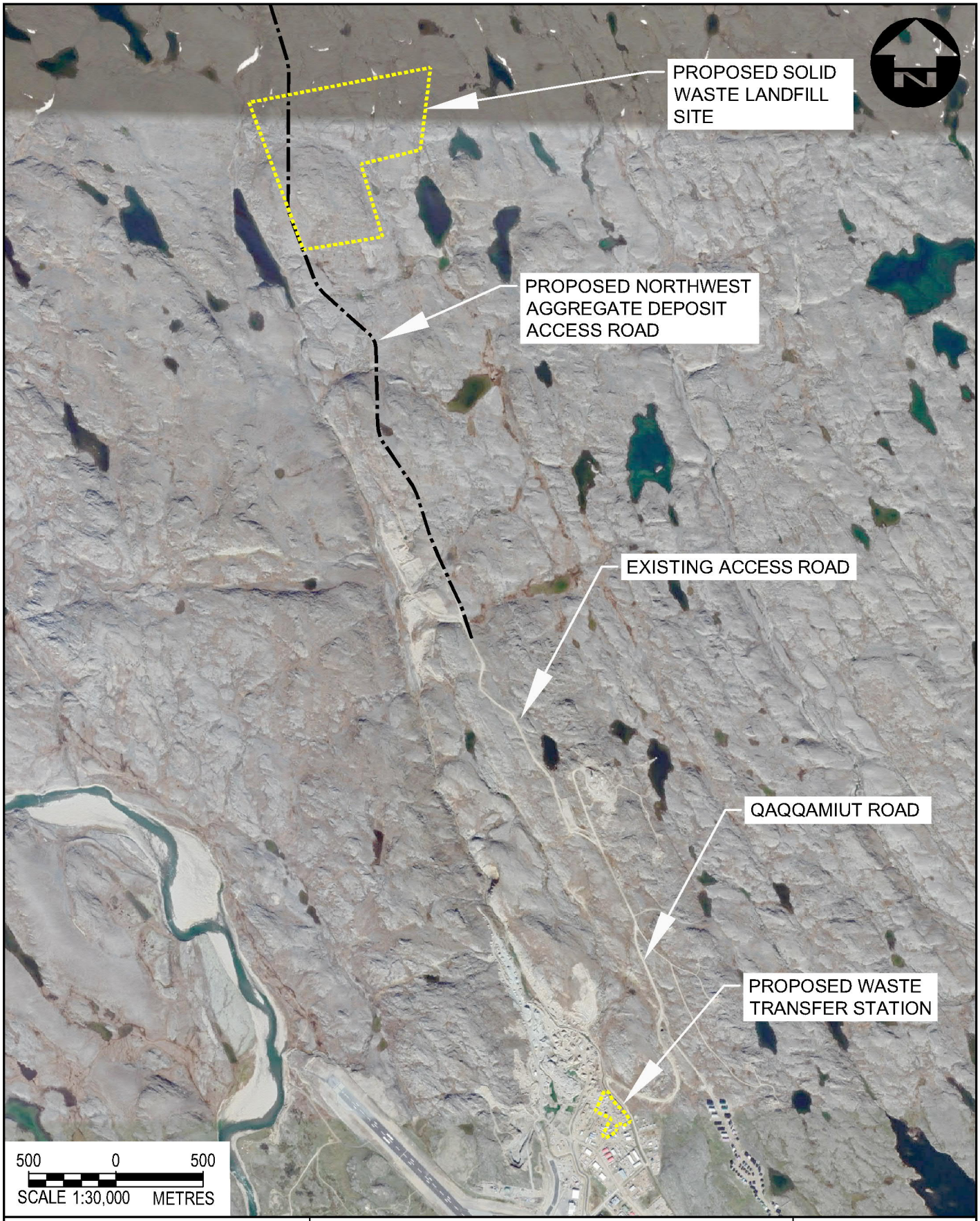
The overall site locations are presented in Figure 1-1, with the layouts for the WTS and the Landfill being provided on Figures 1-2 and 1-3, respectively.

Other planned features of the WTS include a public drop off area for household hazardous wastes (HHW) and a vehicle logger/compactor unit; in both instances allowing for the preparation of waste materials before shipping to approved management facilities in the south.

The access road that will be used to reach the new Landfill has been designed by EXP Services Inc., who will also be providing Construction Contract Administration services for the establishment of the road. It is anticipated that the construction of the road will be included in the new Landfill and WTS Contractor's scope of work.

To address their objectives, and following a competitive proposal process, the City engaged Dillon Consulting Limited (Dillon) to provide design and construction contract administration services to support the establishment of the WTS/baling facility and the engineered Landfill. The engineered Landfill will be designed for 75 years of operation but the construction/build portion of the project only the first stage of the Landfill (Stage 1 Operational Landfill) will be constructed (e.g., Cell 1 and ancillary components to meet requirements for an initial five years of operation).

Development of the proposed facilities is scheduled to commence in 2022, with facility commissioning occurring in 2024/25.



DILLON CONSULTING

DATE AUGUST 2022

PROJECT
IQALUIT LANDFILL & WASTE TRANSFER STATION
OPERATIONS & MAINTENANCE MANUAL

TITLE
SITE LOCATIONS

PROJECT NO.
19-9543

FIGURE NO.
1-1

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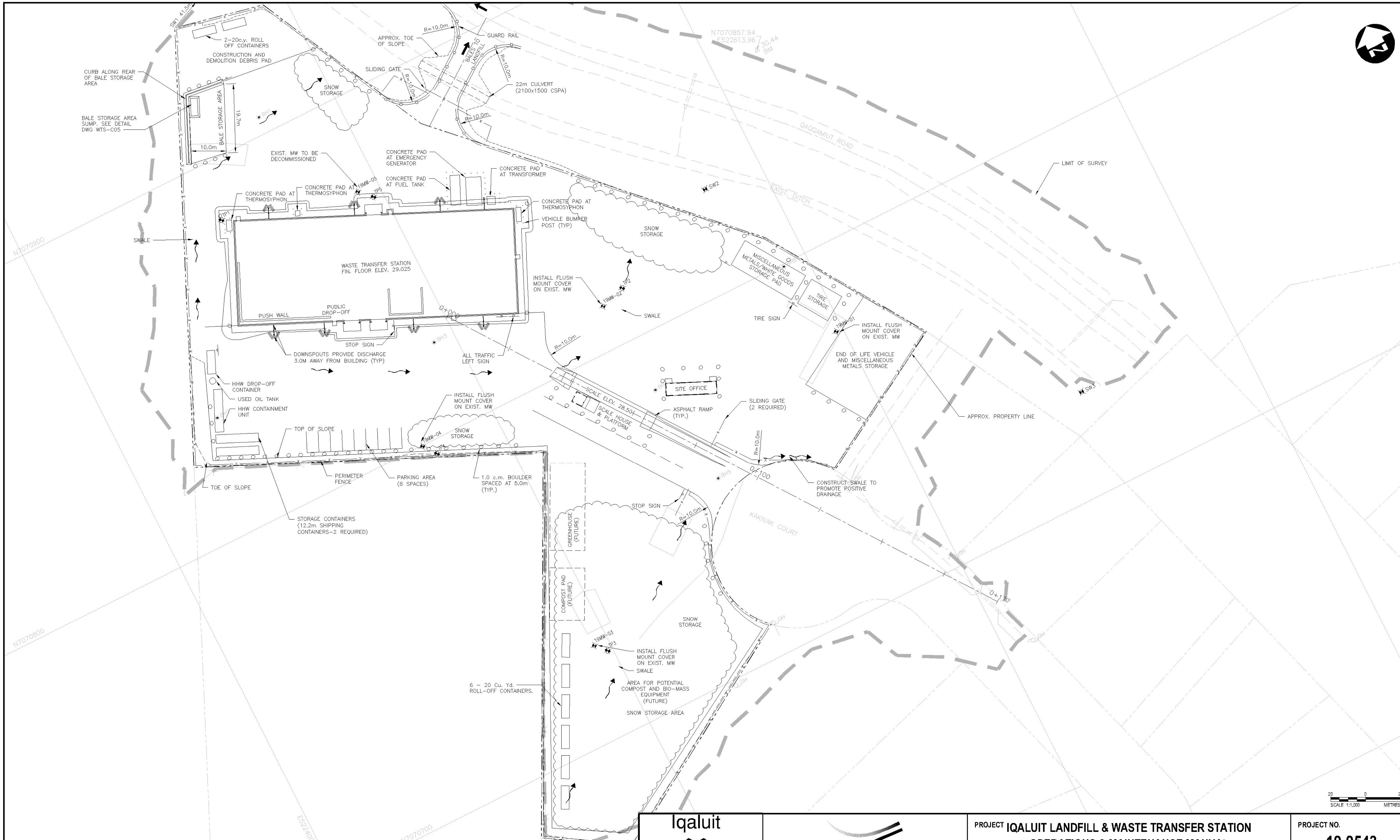
2-20c.y. ROLL OFF CONTAINERS
CONSTRUCTION AND DEMOLITION DEBRIS PAD
CURB ALONG REAR OF BALE STORAGE AREA
BALE STORAGE AREA SUMP. SEE DETAIL DWG WTS-C05
BALE STORAGE AREA
19.7m
10.0m
SNOW STORAGE
APPROX. TOE OF SLOPE
R=10.0m
GUARD RAIL
BALES TO LANDFILL
SLIDING GATE
22m CULVERT (2100x1500 CSPA)
N7070857.94
E522613.96
QAQQAMIUT ROAD
LIMIT OF SURVEY
EXIST. MW TO BE DECOMMISSIONED
CONCRETE PAD AT EMERGENCY GENERATOR
CONCRETE PAD AT FUEL TANK
CONCRETE PAD AT TRANSFORMER
CONCRETE PAD AT THERMOSYPHON
CONCRETE PAD AT THERMOSYPHON
CONCRETE PAD AT THERMOSYPHON
VEHICLE BUMPER POST (TYP)
EXIST. DITCH
SWALE
N7070900
WASTE TRANSFER STATION FIN. FLOOR ELEV. 29.025
PUSH WALL
PUBLIC DROP-OFF
INSTALL FLUSH MOUNT COVER ON EXIST. MW
SWALE
MISCELLANEOUS METALS/WHITE GOODS STORAGE PAD
TIRE STORAGE
TIRE SIGN
INSTALL FLUSH MOUNT COVER ON EXIST. MW
END OF LIFE VEHICLE AND MISCELLANEOUS METALS STORAGE
STOP SIGN
DOWNSPOUTS PROVIDE DISCHARGE 3.0M AWAY FROM BUILDING (TYP)
ALL TRAFFIC LEFT SIGN
R=10.0m
SITE OFFICE
SCALE ELEV. 28.50
SCALE HOUSE & PLATFORM
ASPHALT RAMP (TYP.)
SLIDING GATE (2 REQUIRED)
APPROX. PROPERTY LINE
HHW DROP-OFF CONTAINER
USED OIL TANK
HHW CONTAINMENT UNIT
INSTALL FLUSH MOUNT COVER ON EXIST. MW
SNOW STORAGE
TOP OF SLOPE
TOE OF SLOPE
PERIMETER FENCE
PARKING AREA (8 SPACES)
1.0 c.m. BOULDER SPACED AT 5.0m (TYP.)
CONSTRUCT SWALE TO PROMOTE POSITIVE DRAINAGE
STORAGE CONTAINERS (12.2m SHIPPING CONTAINERS-2 REQUIRED)
STOP SIGN
R=10.0m
KAKIVAK COURT
GREENHOUSE (FUTURE)
COMPOST PAD (FUTURE)
N7070800
SNOW STORAGE
INSTALL FLUSH MOUNT COVER ON EXIST. MW
SWALE
AREA FOR POTENTIAL COMPOST AND BIO-MASS EQUIPMENT (FUTURE)
SNOW STORAGE AREA
6 - 20 Cu. Yd. ROLL-OFF CONTAINERS.
E522400
N7070700
SCALE 1:1,000
METRES

Iqaluit

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PROJECT	IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL
PROJECT NO.	19-9543
TITLE	WTS SITE LAYOUT PLAN
FIGURE NO.	1-2
DATE	AUGUST 2022

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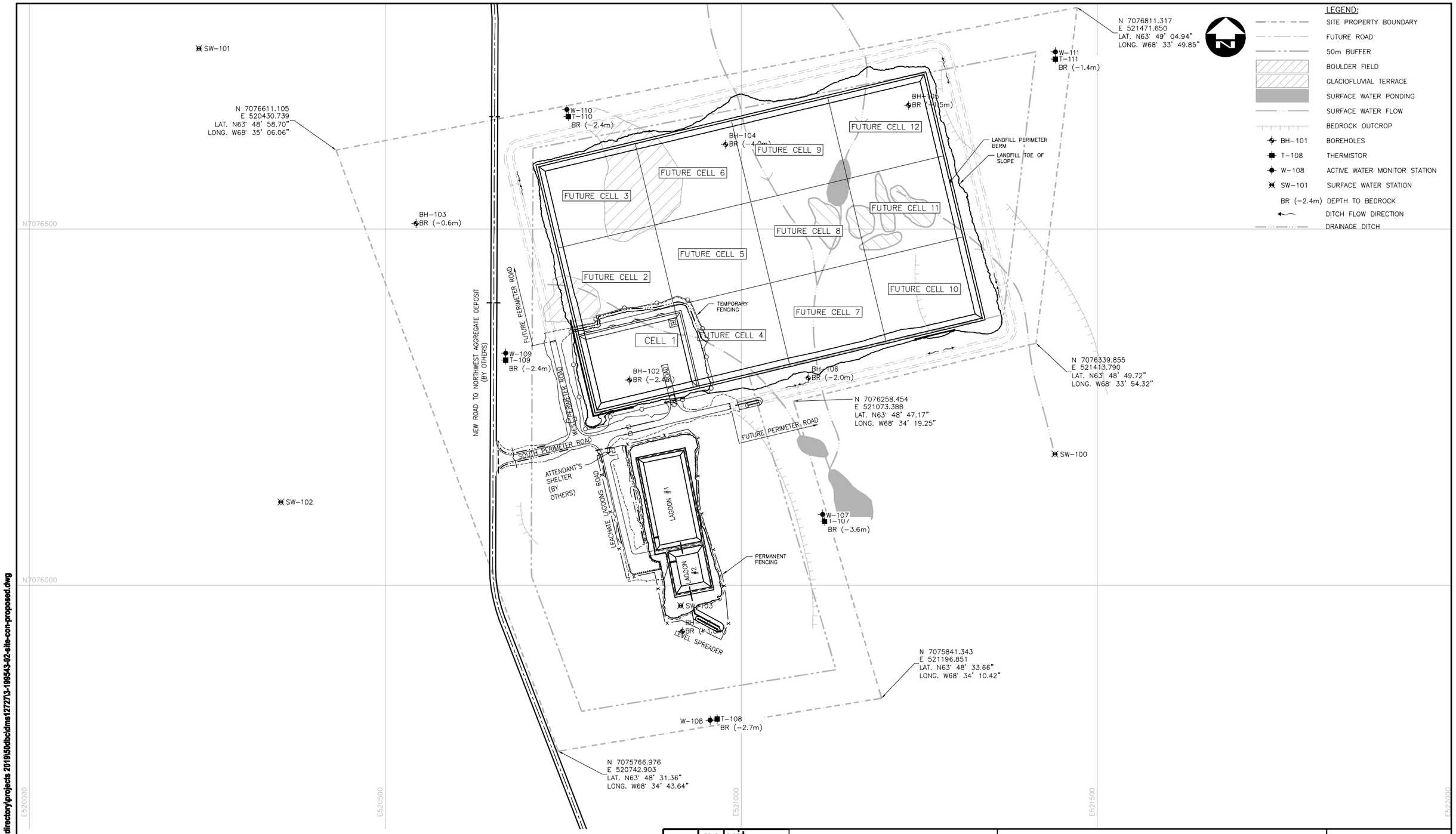

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Iqaluit

DILLON CONSULTING

DATE AUGUST 2022

PROJECT IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL

PROJECT NO. 19-9543

TITLE LANDFILL LAYOUT PLAN

FIGURE NO. 1-3

1.2 Content

The Operations and Maintenance Manual addresses the following topics:

- Days and hours of operation
- Security and access control
- Staff and equipment
- Waste quantities and types
- Waste control
- Daily bale/waste placement
- Adverse weather conditions
- Initial life construction
- Nuisance control protocols, including litter, dust, noise, odour, birds, vector, vermin and wildlife
- Complaint response protocol
- Traffic control
- Fire prevention and response
- Surface water management
- Leachate management
- Landfill gas (LFG) management
- Inspection and maintenance program
- Record keeping
- Reporting
- Operations monitoring program
- Sample site logs and forms

The development of the site will be consistent with applicable regulations and policies for environmental protection. The facility has been designed with a composite liner system, leachate management system, surface drainage control and an environmental monitoring network.

It is noted that equipment-specific manufacturer's documentation, providing details on operational and maintenance requirements, is to be referred to along with the attached Operations and Maintenance Manual.

2.0 Facility Operations

2.1 Access Control

2.1.1 Hours of Operation

The City of Iqaluit Landfill and WTS is open Monday through Saturday, excluding holidays. The site is open to receive waste from 8:00 am to 4:00 pm Monday through Friday, and 8:00 am to 12:00 pm Saturday. Only the WTS will be accessible by the general public.

The site will be closed on the following holidays:

- New Years's Day
- Good Friday
- Easter Monday
- Victoria Day
- Canada Day
- Nunavut Day
- Civic Day (first Monday in August)
- Labour Day
- Thanksgiving
- Remembrance Day
- Christmas Day
- Boxing Day

Site equipment may operate beyond posted hours. The additional time may be necessary for processing of materials at the WTS preparation of the working area receiving waste and for other work defined by management personnel.

The operating hours are prominently posted on the entrance signs for both the Landfill and WTS, which also identifies the site name and the site telephone number.

2.1.2 Site Security

Due to the nature of the work undertaken at the Landfill and WTS, site security and safety is an important feature of the overall operation. Lockable gates are situated at various locations throughout both properties. As detailed on the Engineering Drawings, permanent 2.4 m chain link fencing is provided around the perimeter of the WTS property. At the Landfill, similar fencing will be established around the leachate holding ponds as well as Cell 1. As additional cells are constructed in the future, the fencing will be extended to contain active and previously developed portions of the Landfill. No trespassing signage will be affixed to the fencing at regular intervals. Fencing of both the leachate ponds and the Landfill will serve as an access deterrent to wildlife and the public.

Keys/electronic access cards will be provided to persons employed by the City and directly involved with the operation of the WTS and/or Landfill, at the discretion of the Director of Engineering and Public Works or Manager of Solid Waste (Manager). A record shall be kept at the Scale House relating to who has keys, including contact name and phone number. A general visitor log (Appendix A) shall also be maintained at the Scale House. When either site is unattended, the gates will be closed and locked.

3.0 Personnel

3.1 Staffing

The Landfill and WTS will require full and part-time staff. In general, the facility requires a Manager, Facility Supervisor, Baler/Biomass System Operator, Mobile Equipment Operators, Scale House Operator, Traffic Controller/Utility Worker and Part-Time Assistants. An organization chart defining staffing and reporting responsibilities at the Landfill and WTS is presented in Figure 3-1. All employees will be properly trained in accordance with the tasks that they will be expected to complete.

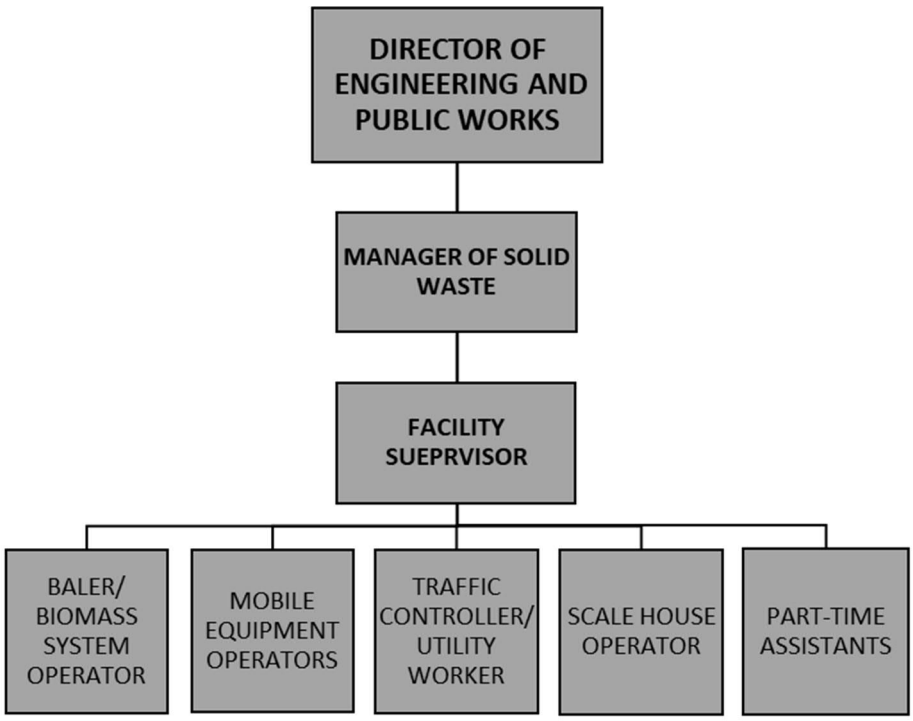


Figure 3-1: Facility Organization Chart

A general outline of the minimum duties and responsibilities of each position follows. It is not intended to be comprehensive or to limit the employee's opportunity to expand their capabilities beyond this scope. It is also not intended to limit the employer's right to assign other duties. Further, it is anticipated that the City of Iqaluit will refine/revise staff member roles and responsibilities consistent with existing employment agreements and identified operational needs.

Generally, consistent with their duties, facility staff will be situated at the WTS during the working day. The exception to this will be when baled or C&D wastes require delivery/placement at the Landfill or when scheduled maintenance or operational activities are necessary at the site.

3.1.1 Director of Engineering and Public Works

The Director of Engineering and Public Works assists the City's Chief Administrative Officer (CAO) and the Manager of Solid Waste in planning and coordinating operation at the Landfill and WTS, as they relate to:

- Developing operational budgets;
- Preparation of annual reports;
- Technical operation; and
- Environmental monitoring.

3.1.2 Manager of Solid Waste

The Manager of Solid Waste is responsible to the Director of Engineering and Public Works for the operation of the facility. The Manager oversees and coordinates day-to-day operations at the site.

Reporting Relationships

Reports to: Director of Engineering and Public Works
Supervises: Landfill and WTS Personnel

Maintains Liaison with:
CAO
Municipal Engineer
Citizen's Monitoring Committee (as applicable)
Purchasing Manager
Accounting Personnel
Payroll Clerk
Suppliers
Contractors

Duties and Responsibilities

The Manager shall:

1. Perform operations at the facility per the Operations and Maintenance Manual (latest approved version), applicable Engineering Drawings and the Water License issued by Nunavut Water Board (NWB), and in consultation with the CAO.
2. Ensure that only acceptable wastes, as indicated on the approved list for disposal, are permitted at the site, in consultation with the CAO and regulatory agencies.
3. Prepare regularly scheduled reports on progress and planning at the facility. To include the preparation of an annual Facility Operating Report summarizing facility performance and activity

information and incorporating an assessment of noted operational issues at the WTS and Landfill (with reference to Daily and Weekly Checklists – see Appendix A) complete with recommended mitigatory actions.

4. With the assistance of the CAO, prepare facility operating budgets and undertake staffing selections.
5. Communicate (as required) with NWB, including the forwarding of monitoring results.
6. Deal directly with the public, responding to disposal requests.
7. Coordinate site visits/tours.
8. Provide overall direction for daily site activities, including equipment and staff utilization.
9. Maintain the environmental monitoring program.
10. Coordinate the environmental sampling programs.
11. Ensure that site staff receives the required training.
12. Make recommendations to the CAO for major and minor repair work required for site equipment, as well as replacement of same.
13. Ensure that the site is maintained and operated cleanly and safely at all times, including regular collection of litter.
14. Ensure that solid waste bales and C&D debris materials are placed at the Landfill per the Operations and Maintenance Manual (latest approved version), and in consultation with the Municipal Engineer.
15. Coordinate the preparation of balefill areas for operation, including stockpiling cover material, and identifying the requirement for composite liner installation and the establishment of surface water control measures.
16. Ensure that there is no open burning of solid waste at the facility.
17. Perform other related duties, as may be assigned periodically by the CAO.

3.1.3 Facility Supervisor

Under the direction of the Manager, the Facility Supervisor is responsible for equipment and general site maintenance requirements at the facility.

Reporting Relationships

The Facility Supervisor reports directly to the Manager.

Duties and Responsibilities

The Facility Supervisor shall:

1. Perform operations at the facility per the Operations and Maintenance Manual (latest approved version), applicable Engineering Drawings and the Water License issued by NWB, and in consultation with the Manager.
2. Ensure that only acceptable wastes as indicated on the approved list for disposal are permitted at the site, in consultation with the Manager and regulatory agencies.
3. Be responsible for the maintenance of the facility machinery, including mobile equipment, the solid waste baler unit, biomass system, vehicle logger and related systems.

4. Make recommendations to the Manager for major and minor repair work required for facility equipment, as well as replacement of the same.
5. Ensure that the facility is maintained and operated in a clean and safe manner at all times, including regular collection of litter.
6. In coordination with the Manager, ensure that solid waste bales and C&D debris materials are placed at the Landfill, in accordance with the Operations and Maintenance Manual (latest approved version).
7. Be responsible for snow removal on the access roads within the site and other areas, as necessary.
8. Maintain the access roads to ensure there is reasonable access within the site and to the active Landfill at all times.
9. Be responsible for operating and maintaining the leachate handling equipment, and surface water control structures and facilities at the Landfill and WTS.
10. Undertake site security checks and report any problems to the Manager.
11. Inspect the public roads/areas surround the WTS, the Landfill access road, and the Landfill to recover any accumulation of garbage or other debris.
12. Recommend to the Manager the need for bird control, rodent, animal and odour control.
13. Ensure that there is no open burning of solid waste at the site.
14. Maintain records of site equipment usage and maintenance.
15. In coordination with the Manager, maintain the integrity of completed landfill cells and borrow areas.
16. Perform such other related duties, as may be assigned from time to time by the Manager.

3.1.4 Baler/Biomass System Operator

Under the direction of the Facility Supervisor, the Baler/Biomass System Operator is responsible for operating and maintaining the solid waste baler unit, biomass feedstock preparation/combustion system, vehicle logger and related systems.

Reporting Relationships

The Baler/Biomass System Operator reports directly to the Facility Supervisor.

Duties and Responsibilities

The Baler/Biomass System Operator shall:

1. Perform operations at the facility in accordance with the Operations and Maintenance Manual (latest approved version), applicable Engineering Drawings and the Water License issued by NWB, and in consultation with the Facility Supervisor.
2. Ensure that only acceptable wastes as indicated on the approved list for disposal are permitted at the site, in consultation with the Facility Supervisor.
3. Make recommendations to the Facility Supervisor for major and minor repair work required for the solid waste baler, biomass system, vehicle logger, and related systems.

4. Maintain an operational record for the solid waste baler, biomass system, vehicle logger and related systems.
5. Ensure that the tipping floor and baling floor is maintained and operated in a clean and safe manner at all times.
6. Periodically operate mobile equipment associated with site operations.
7. Perform such other related duties, as may be assigned from time to time by the Facility Supervisor and/or the Manager.

3.1.5 Mobile Equipment Operators

Under the direction of the Facility Supervisor, the Mobile Equipment Operators are responsible for operating and maintaining mobile equipment utilized for waste handling and disposal operations. At least two Mobile Equipment Operators will be on-site every day the facility is open to the public.

Reporting Relationships

Mobile Equipment Operators report directly to the Facility Supervisor.

Duties and Responsibilities

The Mobile Equipment Operators shall:

1. Perform operations at the facility in accordance with the Operations and Maintenance Manual (latest approved version), applicable Engineering Drawings and the Water License issued by NWB, and in consultation with the Facility Supervisor.
2. Ensure that only acceptable wastes as indicated on the approved list for disposal are permitted at the site, in consultation with the Facility Supervisor.
3. Be responsible for the operation and routine maintenance of the site machinery.
4. Make recommendations to the Facility Supervisor for major and minor repair work required for site equipment.
5. Ensure that the site is maintained and operated in a clean and safe manner at all times.
6. Ensure that solid waste bales and C&D debris materials are placed at the Landfill, in accordance with the instructions of the Facility Supervisor.
7. Carry out activities for the maintenance and repair of access roads, snow removal, preparation of balefill areas, excavation and stockpiling of cover material, and the installation and/or repair of leachate collection and surface water control structures, as directed by the Facility Supervisor.
8. Advise the Facility Supervisor of the need for pest control.
9. Remove freon from refrigerators (and similar equipment) and specified liquids from vehicles, following applicable regulations.
10. Operate the HHW drop off facility.
11. Ensure that there is no open burning of solid waste at the site.
12. Perform such other related duties, as may be assigned from time to time by the Facility Supervisor and/or the Manager.

3.1.6 Traffic Controller/Utility Worker

Under the direction of the Facility Supervisor, the Traffic Controller/Utility Worker is responsible for directing the movement of vehicles delivering waste materials to the tipping floor within the WTS.

Reporting Relationships

The Traffic Controller/Utility Worker reports directly to the Facility Supervisor.

Duties and Responsibilities

The Traffic Controller/Utility Worker shall:

1. Direct incoming vehicles to the location on the tipping floor where solid waste is to be deposited.
2. Ensure that adequate signage and traffic control devices are in place in coordination with the Manager.
3. Direct the movements of waste delivery vehicles and their personnel within the transfer station compound to prevent conflicts with facility equipment operations.
4. Ensure that only acceptable wastes as indicated on the approved list for disposal are permitted at the site, in consultation with the Manager.
5. Segregate banned and salvageable materials noted on the tipping floor to designated storage areas.
6. Periodically operate mobile equipment associated with site operations.
7. Ensure that the area around the building and the tipping floor is operated in a clean and safe manner at all times, including regular collection of litter.
8. Perform such other related duties, as may be assigned from time to time by the Facility Supervisor and/or the Manager.

3.1.7 Scale House Operator

Under the direction of the Facility Supervisor, the Scale House Operator performs all duties related to the operation of the facility's scale component.

Reporting Relationships

The Scale House Operator reports directly to the Facility Supervisor or a designated member of staff.

Duties and Responsibilities

The Scale House Operator shall:

1. Identify and register vehicles within the computerized site database.
2. Manage the customer billing system.
3. Collect tipping fees from customers on-site.
4. Inspect incoming waste per the Operations and Maintenance Manual (latest approved version).
5. Answer incoming telephone calls and requests for information, directing such requests as required.
6. Monitor use of the public drop-off door at the WTS.
7. Clean and maintain the scale.

8. Perform such other related duties as may be assigned from time to time by the Facility Supervisor and/or the Manager.

3.1.8 Part-Time Assistants

Under the direction of the Facility Supervisor, the Part-Time Assistants are responsible for tasks assigned to them by a designated member of staff. These positions would typically serve to address periodic site maintenance requirements.

Reporting Relationships

The Part-Time Assistant reports directly to the Facility Supervisor or a designated member of staff.

Duties and Responsibilities

The Part-Time Assistant shall:

1. Perform duties as assigned by the Manager, Balefill Supervisor or a designated member of staff.

3.2 Training

Every Landfill and WTS employee will be trained to perform his or her job in a safe and environmentally responsible manner, following applicable regulations and City policy. Employees will be kept current with changes in regulations and technology through ongoing, comprehensive training courses, in such areas as regulations and the technical aspects of landfill operation. Specific training topics may include surface water control, leachate and LFG management, spill prevention, special wastes control, environmental monitoring and safety. A municipal employee's health and safety committee serves as a forum to identify potential concerns and define appropriate actions.

Continuing on-the-job training will be provided for 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 and WTS. All employees will be given safety training covering all equipment and systems, with which they will be expected to operate daily. The dangers associated with the use of protective equipment, methane (CH_4) gas and leachate handling, and the handling and precautions associated with special wastes, will also be included in the safety training. Documentation of the employee's participation in the safety and environmental training will be maintained in the employee's personnel file.

A training program for more specific tasks, such as those of the baler, biomass system and mobile equipment operators, will be documented with written records of meetings and types of instruction. This instruction will include identification of special wastes and unacceptable wastes; emergency procedures in case of fire, spill or injury; confined space entry; respirator use and fit testing; and other issues that will periodically arise. All individuals must be trained in confined space entry and practice proper safety procedures, following applicable legislation and the requirements of the Nunavut Labour

Standards Office. Documentation will also be kept on file at the Manager's office and reviewed annually for any necessary updates.

A general outline of some of the training that employees will require is found in Table 3-1. It is not intended to be a comprehensive list or to limit additional staff training, should legislation change, or limit the employer's or employee's right to require additional training.

Table 3-1: Staff Training Recommendations

Program	Position						
	Manager of Solid Waste	Facility Supervisor	Baler/ Biomass System Operator	Mobile Equipment Operators	Traffic Control/Utility Worker	Scale House Operator	Part-Time Assistants
WHMIS	✓	✓	✓	✓	✓	✓	✓
Emergency First Aid	✓	✓	✓	✓	✓	✓	✓
Confined Space Entry	✓	✓	✓				

4.0 Site Structures

Primary structures associated with operations at the Landfill and WTS are illustrated in Figures 1-2 and 1-3. Infrastructure descriptions are subdivided as follows: 1) structures at/in proximity to the WTS are discussed in **Section 4.1**, and 2) structures associated with the Landfill are described in **Section 4.2**.

4.1 Waste Transfer Station

4.1.1 Facility Roads

The road network serving the WTS includes 1) Kakivak Court, acting as the main access route and connecting the site to Federal Road, 2) parking and maneuvering areas around the perimeter of the WTS, and 3) dedicated access to from the WTS compound to Qaqqamiut Road (as associated with the transport of baled waste to the Landfill). The perimeter of the WTS property is fenced with lockable access gates, situated at the Kakivak Court and Qaqqamiut Road entrances.

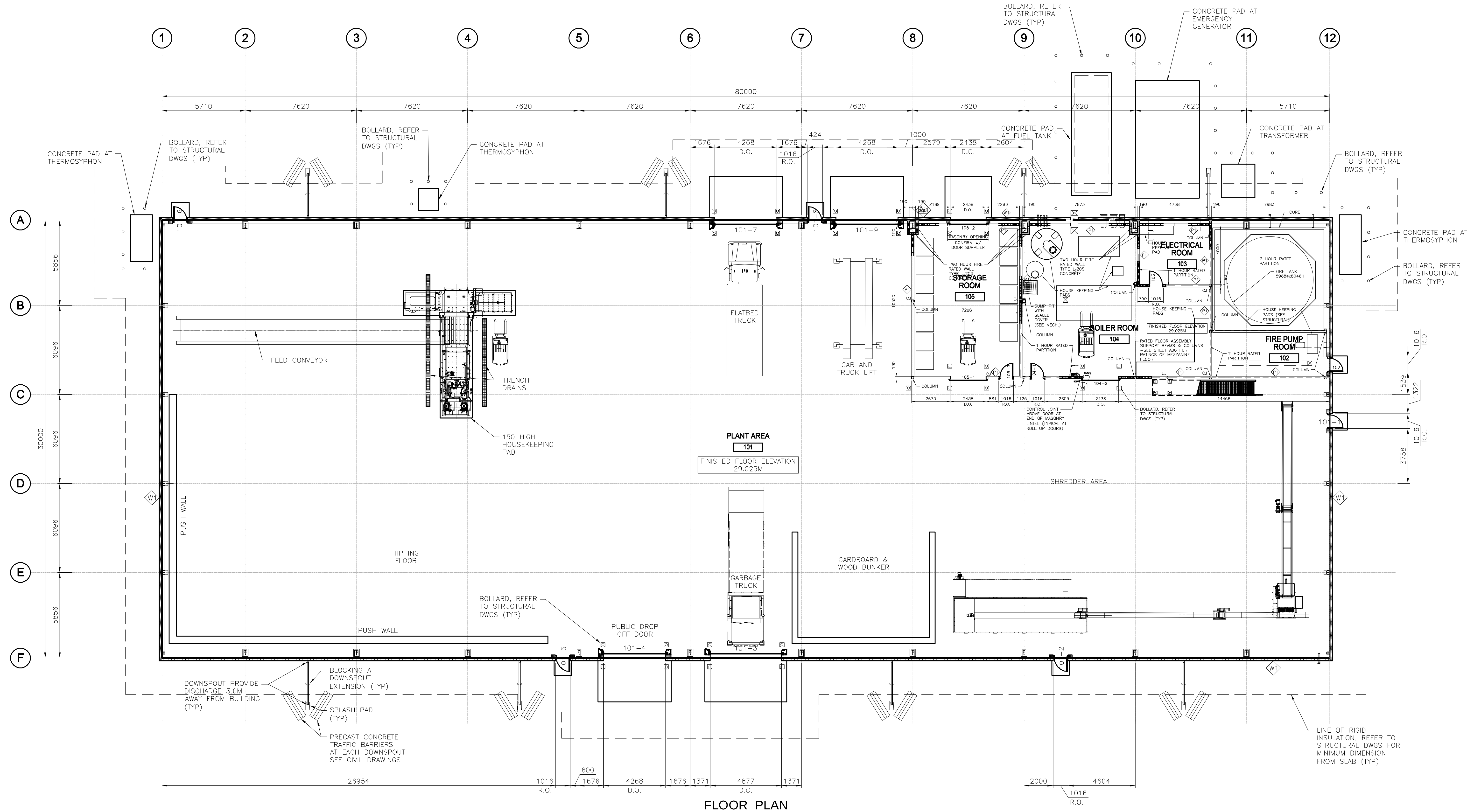
The facility roads/yard areas are private and their maintenance will be the responsibility of the City. Maintenance of the facility roads includes, but is not limited to, dust and mud tracking control, and snow removal/ice control.

4.1.2 Scale and Scale House

The Scale and Scale House are located southeast of the WTS Building. As described in **Section 8.2.1**, all vehicles entering the site are required to report to the Scale House. The Scale House, a premanufactured wood frame structure with electric heating, includes an elevated load inspection video camera and PC-based scale control/invoicing equipment. The Scale House entrance and exit ramps will have an asphalt surface.

4.1.3 WTS Building

The WTS Building is a pre-engineered, steel, slab on grade structure with a total floor area of approximately 2,400 m^2. With reference to Figure 4-1, the interior of the building is divided into five primary areas: 1) the **tipping floor** is used to allow haulage vehicles to discharge their loads within an enclosed area – it also includes a wall opening to allow for public drop off of refuse materials; 2) the baling/bale loading area is where the waste is compressed into wire-tied and plastic-wrapped bales and transferred to the flatbed transport truck; 3) select materials are processed and stored in the shredder area; 4) end of life vehicles are prepared for compaction at the **car and truck lift area**; and 5) a variety of control systems and equipment, including a biomass boiler, are located in the mechanical/electrical area.



SCALE 1:125 METRES

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DILLON CONSULTING

DATE AUGUST 2022

PROJECT IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL

PROJECT NO. 19-9543

TITLE WTS INTERIOR LAYOUT

FIGURE NO. 4-1

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Due to the nature of operations, the concrete walls extend upward from the slab in the tipping floor portion (southwest corner) of the building. The tipping floor's concrete walls are 2.4 m high, permitting storage of solid waste against the inside of the building and allowing for a smooth durable surface to work against. The concrete walls around the remainder of the interior perimeter are 1.2 m in height to provide impact protection to the building structure from mobile equipment.

Due to issues associated with clogging and an objective to minimize the number of slab penetrations, there are no floor drains within the interior of the WTS; interior slab slopes are typically towards exterior overhead doors. Liquid on the floor (primarily from incoming waste and hauling vehicles) is continuously monitored by facility staff, using the absorbent capacity of the waste, as required. Cleaning of the floor via sweepers and other means is conducted, as required.

A source of liquid generation at the WTS is the waste baler where liquids are squeezed out of the waste as the baler compacts the waste. The volume generated is variable and dependent on the moisture content of the waste and snow/ice that may be attached to the delivered waste Liquid from the baler would collect in the shallow trench around the baler and flow to a sump where it is pumped to a 4500 l tank for subsequent, testing if required, collection and transfer to the City's wastewater treatment plant (WWTP).

Mechanical and electrical features of the WTS building include the following:

- Interior heating requirements (using a hydronic system) are met using a biomass boiler that uses shredded as fuel. Back up requirements for select interior areas of the WTS will be provided by a No.2 fuel-fired hydronic heating unit. A 4,880 L double-wall aboveground tank situated outside the building provides fuel for the back-up unit.
- Interior heating requirements (using a hydronic system) are met using a biomass boiler that uses shredded as fuel. Back up requirements for select interior areas of the WTS will be provided by a No.2 fuel-fired hydronic heating unit. A 4,880 L double-wall aboveground tank situated outside the building provides fuel for the back-up unit.
- Exhaust fans serving the interior of the WTS to provide general ventilation and achieve interior air quality requirements.
- Select use of radiant heaters in defined locations to address equipment requirements and to prevent the freezing of waste.
- Provision of interior fire protection, using a sprinkler system with a dedicated on-site water tank inside a fire-protected room within the WTS.
- Water for interior building maintenance and equipment requirements addressed with an on-site storage tank. Staff washroom and shower facilities are located at the Site Office.

4.1.4 Site Office

A wood-framed, premanufactured building, situated adjacent to the Scale House, serves as the Site Office. The building incorporates staff facilities, including the Facility Supervisor's office, a lunchroom, a locker room and washroom/shower facilities. The building will be heated using an oil-fired, forced air furnace, and will be serviced with a water and wastewater tank.

4.1.5 Household Hazardous Wastes Depot and Storage

Steel intermodal ("seacan") containers, modified to address storage requirements for receiving HHW materials, as well as one pre-fabricated container specifically constructed as an HHW storage container with secondary containment (Loraday Model LEP/L73-4013 Storage Container or equivalent), are situated in the southwestern area of the WTS yard. One 12 m (40 ft.) container serves as a public drop off location, where a trained staff member records incoming quantities and directs the materials to an appropriate initial storage location. As required, materials from the Drop Off Container are directed to one of the 12 m storage containers or the purpose-built HHW building with secondary containment (Loraday Model LEP/L73-4013 Storage Container or equivalent). Arrangements are made by the City for subsequent shipping to approved-management facilities in the south, as quantities warrant.

4.1.5.1 Household Hazardous Wastes Acceptable Materials

It is recommended that following wastes not be accepted for landfilling or recycling and instead be considered Household Hazardous Waste (HHW). Please note that this list is not exhaustive and is subject to change per City of Iqaluit and/or Government of Nunavut guidelines:

- Alkaline batteries
- Button cell batteries
- Rechargeable batteries
- Lead-acid batteries
- Fluid paints, stains, varnishes and oil paint products
- Empty paint, stain, varnish and oil paint product cans
- Varnish remover
- Cleaning chemicals and disinfectants (i.e., toilet cleaner, oven cleaner, drain cleaner)
- Antifreeze/radiator fluids
- Bleach
- Brake fluid
- Pesticide/insecticides/rodenticides
- Herbicides/weed killer
- Chemical lawn fertilizers
- Insect repellants
- Gasoline
- Fuel oil
- Used oil products
- Solvents and thinners
- Pharmaceuticals and drugs (or return to pharmacy)
- Aerosols and empty aerosol cans
- BBQ propane tanks
- Camping fuel cylinders
- Oil tanks
- CFL and fluorescent light bulbs
- Fluorescent lighting ballasts manufactured before 1980
- Thermostats
- Household thermometers (mercury-containing)
- Residential fire extinguishers
- Any products labelled as corrosive, toxic, reactive, explosive, oxidizing, poisonous, infectious or flammable

- Any product or container labelled as follows:

Reactive | Poisonous and **Infectious** | Oxidizing | Flammable and **Combustible** | Corrosive | Compressed Gas

4.1.5.2 Household Hazardous Waste Non-Acceptable Materials

The following materials are not accepted as HHW:

- Electronics; and
- Sharps and other household medical waste.

4.1.6 Exterior Material Process and Storage Areas

The exterior yard area (gravel surface) includes equipment and locations for the processing and temporary segregated storage of select materials, including:

- Vehicle Baler/Logger unit (trailer-based);
- End of life vehicles awaiting decommissioning/crushing, crushed vehicles and salvageable metals;
- End of life vehicle and equipment tires;
- HHW intermodal containers;
- HHW 12.2 m L x 3.7 m D (40'L x 12'D), 4-compartment, built in accordance to FM 6049 Standards (Loraday Model LEP/L73-4013 Storage Container or equivalent);
- Baled waste (to address short-term instances when direct transport to the Landfill is not possible);
- A dedicated area for the potential future installation/operation of an in-vessel organics composting unit (including a curing area allowance);
- A dedicated area for the potential future development of a greenhouse; and
- Snow storage areas to support yard clearing efforts.

4.2 Landfill

4.2.1 Landfill Access Road

A two-lane, gravel-surfaced road connecting the existing Qaqqamiut Road to the Landfill site is being established by the City as a component of the Landfill and WTS project. The road will also provide access to the Northwest Aggregate Deposit, situated to the west of the landfill property.

With reference to Figure 1-3, two roads will extend off of the Northwest Aggregate Deposit road to access features of the Landfill:

- Main Landfill access and perimeter road; and
- Leachate management system access road.

Lockable security gates are situated at the entrance of each access road, complete with identification signage. As new landfill cells are established, the perimeter road will be extended, as necessary. All site roads are two-lane and gravel-surfaced.

4.2.2 Landfill

A 22 ha area on property approximately 5.5 km north of the WTS has been designated to serve as the disposal location for the City's baled municipal solid waste (MSW), select processed materials (e.g., tires, bulky items) and non-divertible C&D waste materials for 75 years. A primary design feature of the Landfill is the use of a membrane liner system with a dedicated leachate collection layer within the defined landfill footprint. The liner is scheduled to be installed in 12 (number to be refined during the operational life of the facility) sequential sections or "cells" throughout the operational life of the site. As part of the initial construction effort for the Landfill (scheduled for the, 2022 and 2023 construction seasons), the first landfill cell, with a total area of approximately 2.3 ha, is to be installed. Cell 1 has been designed to address the City's disposal requirements for approximately the first five years of operation.

Detailed discussion on the Landfill liner system is provided in **Section 7.0**. A description of waste placement procedures at the Landfill is presented within **Section 8.3**.

4.2.3 Cover Borrow Area

Cover material required to support Landfill operations, including bale/waste covering and final grading, is scheduled to be acquired from the Northwest Aggregate Deposit.

4.2.4 Attendant's Trailer

A premanufactured, wood frame trailer will serve as a shelter for site personnel while they are at the Landfill. The trailer will include a wood stove and a composting toilet. No equipment will be stored within the trailer due to the remoteness of the location and the associated potential for theft and/or vandalism.

4.2.5 Leachate Management System

The Landfill's leachate management system includes a leachate collection layer within the cell liner, collection sumps with extraction manhole, a portable pump complete with mechanical float control discharge hosing/discharge piping, two retention ponds (with the ability to convert into bioreactors). Acknowledging significant uncertainties regarding the quality and quantity of leachate that will be generated by the landfill (e.g., the unique situation of having plastic wrapped waste bales in an arctic setting), the initial leachate management system will consist of collection and storage infrastructure only. Over the initial years of operation, leachate quality and quantity can be analyzed, and improvements made to the treatment system as required.

Leachate generated from precipitation or snowmelt will migrate over the plastic wrapped bales and through voids between the bales, exiting at the base of the placed bales or to the side of the bales. It is anticipated that the bales placed when average temperatures are below 0^{o} C will freeze and that over time a core of frozen bales will occur, with exterior bales thawing seasonally as the temperature rises above zero. To facilitate the collection and movement of leachate a 4 m wide pathway, average height 1.3 m to the top of the synthetic materials anchor trench (refer to Section 4 on Sheet LF-C21) has been identified on the north and east sides of Cell 1 and is located between the placed bases and the Temporary Cell Separation Berm, please refer to Sheet LF-C11. This pathway terminates at the sump in the northeast corner of Cell 1 where the leachate pumping sump is located. Should the granular leachate collection layer freeze, this pathway can function as a trapezoidal ditch to collect and move leachate to the sump. As future cells are constructed and become operational similar 4 m wide pathways are identified on Sheet LF-C16 and should be maintained to provide for surficial flow to the sump.

The landfill operator will install the pump and generator each day during the warm season, and the pump will operate on/off based on the float. At the end of the day the operator will remove and store the generator and pump. The portable pump, located in the manhole, will be controlled by portable floats in the manhole, which is in the cell sump. The pump would turn on when there is 200 mm of head over the top of the sump and turn off when there is less than 500 mm of leachate in the sump. The leachate head in the landfill sumps will be measured by a staff gauge bolted to the interior of the manhole. If required, the gauge can be removed at the end of the pumping season to prevent damage. In case the staff gauge is missing, a tape measure can be used to approximate the depth of leachate. Hoses will not be used for leachate pumping; flanged and bolted solid wall HDPE piping should be installed at the start of the season and removed and stored at the end of the pumping season.

The volume of the ponds has been established based (conservatively) on the objective of providing two years of leachate effluent and precipitation storage capacity. By assessing generation rates and effluent characteristics during the initial operational period of the landfill, it is believed that an economic treatment system appropriate to the unique conditions of the City of Iqaluit site can be designed and subsequently installed as part of a future initiative. As the ponds are lined with HDPE, a HDPE staff gauge as presented in the design drawings would be welded to HDPE liner on the inside slope of the ponds.

Four sumps, located in Cell 1, Cell 4, Cell 7 and Cell 10, are proposed in the landfill. As the landfill develops the manhole, initially located in Cell 1, would be relocated to the sump in Cell 4, then Cell 7, then Cell 10. Depending on leachate volumes, waste generation, and the cell capping schedule it may be necessary to operate two or more sumps simultaneously . The Cell 1 sump would receive leachate from Cells 1, 2 and 3. When Cell 4 is constructed the temporary berm between Cell 1 and Cell 4, as illustrated on Drawing LF-C16, would be removed and leachate in Cells 1 to 3 would flow toward the Cell 4 sump. Additionally, the piping that transfers the leachate from Cell 1 to the lagoons would be modified to

accept the flow from the Cell 4 sump. The removal of the berm is necessary as the Cell 1 sump is located in the north of the cell and will be covered with waste as waste is placed in Cell 4.

Cell 4 would receive flow from Cells 4, 5, 6 and from Cells 1, 2 and 3. Cell 7 would accept flow from Cells 7, 8 and 9. Cell 10 handles Cells 10, 11 and 12. For the sump in Cell 10 false grading is required to eliminate the low point north of the sump so that leachate can be directed into the sump as illustrated on Drawing LF-C16.

Additional information on the leachate management system, including contingency measures, is presented in **Section 12**.

4.2.6 Monitoring Network

The development of the Landfill and WTS included the establishment of defined monitoring locations for surface water and active layer/groundwater. With regards to potential impacts of landfill infrastructure to permafrost, a thermistor array is situated in the base of the liner systems for both the landfill and the leachate treatment system ponds.

Details on the monitoring network and the overall monitoring program are presented in the latest version (under separate cover) of the Landfill and WTS Facility Monitoring Program (FMP).

5.0 Mobile Equipment

Mobile equipment selection has been based on the evaluation of the operational functions to be performed, including activities within the WTS, within the WTS yard and at the Landfill. Beyond waste handling related activities, other mobile equipment use requirements include access road maintenance, snow removal and dust control. Equipment used as part of site operations is owned by the City. The listing of recommended site equipment is as follows:

1. Wheel Loader:
   - 150 - 160 HP, diesel;
   - Provided with quick-detach forks, grapple bucket, plow blade, general-purpose bucket and landfill package; and
   - For waste handling in the WTS yard, bale/waste placement at the Landfill, snow removal and road/yard maintenance.
2. Compact Wheel Loader:
   - 110 – 120 HP, diesel;
   - Provided with quick-detach forks, grapple bucket, waste handling bucket (complete with rubber leading edge), plow blade, solid tires, transfer station package; and
   - Waste/bale handling within the WTS, snow removal and yard maintenance.
3. **Forklift:**
   - Electric;
   - 2500 kg lifting capacity; and
   - Bale handling within the WTS including loading of the Bale Truck.
4. Bale Truck:
   - 350 HP, diesel; and
   - Tandem straight truck, flatbed.
5. Portable Tire Shear:
   - 25-35 HP, gasoline;
   - Trailer-based unit; and
   - Minimum 3000 psi hydraulic rating
6. Vehicle Baler/Logger:
   - Diesel;
   - Trailer-based unit;
   - Logging force (per side) 170 tons; and
   - Baling force (per side) 270 tons.
7. Staff Truck:
   - 4 x 4 Crew Cab, Super Heavy Duty; and
   - Provided with snowplow attachment.

In addition, back up equipment will be available from local rentals and contractors, should anomalous situations dictate the need for additional equipment. Routine maintenance and cleaning will be performed (as necessary) to keep equipment in good operating order.

A maintenance program exists for all on-site equipment and is to be performed following the equipment manufacturer's guidelines. The City holds contracts with heavy equipment suppliers to provide all scheduled maintenance. Daily routine maintenance activities will be the responsibility of the mobile equipment operators. Routine activities will include (but not be limited to) the following:

Tires

- Check for debris embedded in the tire, repairing or replacing, as necessary; and
- Check tire wear condition.

Air Filters

- Check for dust clogging and replace, as necessary.

Radiators

- Check for dust and debris clogging and clean, as required; and
- Check for punctures and repair or replace, as necessary.

Undercarriage

- Check for damage and repair, as required.

Hydraulic Lines

- Check for wear points, cracks and fitting leaks, replacing, as necessary.

6.0 Stationary Equipment

The following list identifies stationary equipment associated with waste processing activities within the WTS:

1. Waste Baler:
   - Two ram configuration;
   - Peak throughput = 20 tonnes/hour;
   - Dual hydraulic pumps, 600 VAC 60 Hz electric TEFC motors;
   - Dedicated above floor conveyor;
   - Automatic wire tier; and
   - Complete with bale wrap system.
2. Waste Shredder and Biomass System:
   - Stationary, low speed, high torque unit;
   - 30 HP electric drive motor, 460 VAC 60 Hz;
   - Suitable for MSW including wood pallets, furniture, select C&D materials and old corrugated cardboard (OCC); and
   - Direction of processed material to either the Biomass Boiler (wood and OCC) or the Waste Baler for disposal at the Landfill.

Further information, including operational and maintenance requirements for the baler, shredder and other equipment/systems supporting WTS operation (e.g., biomass boiler/heating system, biomass conveyance system, ventilation system, fire suppression system, electrical/control systems) is provided in manufacturer documents.

Manufacturer's information should be reviewed in detail by facility personnel before use, maintenance or repair.

7.0 Liner Development and Sequencing

7.1 Landfill Liner System

The four primary components of the landfill liner system, from the top down, consist of a leachate **collection layer**, a geomembrane liner, cushion layer and a base layer. These components are described below. Refer to Figure 7-1 for a typical schematic of the composite liner system.

Leachate Collection Layer
The leachate collection layer consists of a granular layer (38 mm clear stone) with a total thickness of 600 mm. The granular collection layer collects and directs (by gravity) leachate to a designated collection sump.

Geomembrane Liner
A flexible geomembrane liner (80 mil textured HDPE) is situated under the leachate collection layer, as the primary barrier to leachate migration. The top and bottom of the flexible membrane liner are protected with non-woven geotextile.

Cushion Layer
The cushion layer, 200 mm of designated fill material, provides the top working surface of the landfill cell and offers protection (e.g., vehicle/equipment movements, waste puncture hazards) to the underlying Leachate Collection Layer.

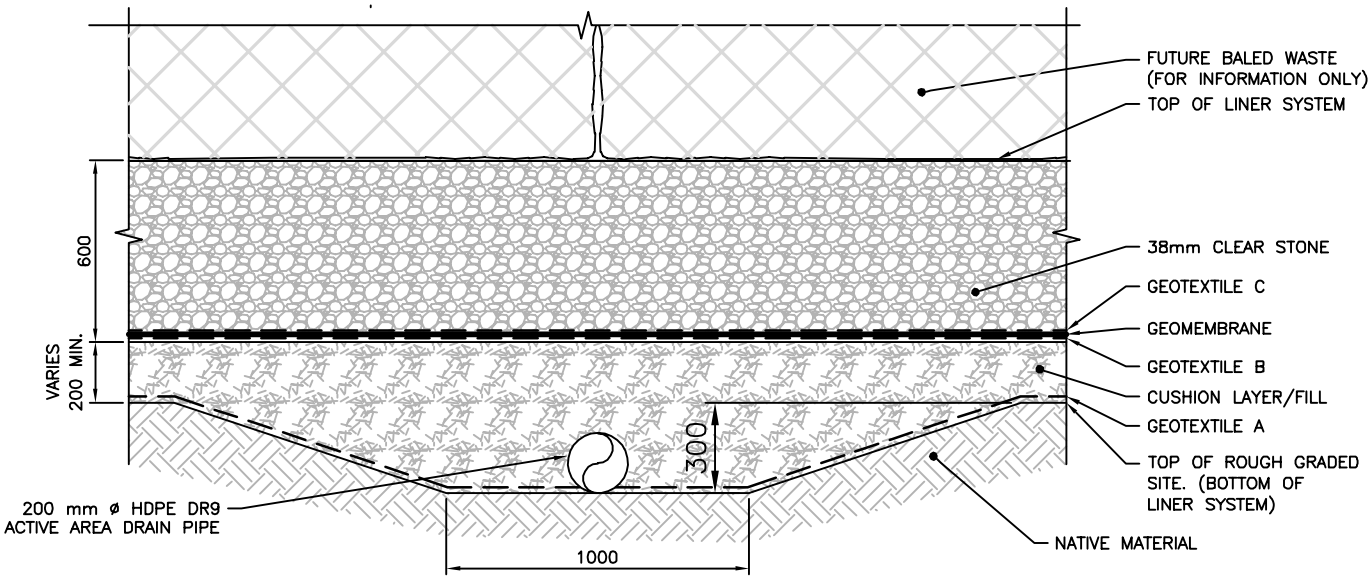
Base Layer
The entire liner system is constructed on an engineered base. The native material at the site will be graded, and a 200 mm thick granular grading pad will be placed over the native material. Additional compacted soils will be placed at the site, where required for grading. Where possible, a 1.5 m separation distance from the underside of the geomembrane and the seasonal high groundwater table.

To monitor potential impacts of the liner system to permafrost, a thermistor array is situated within the base layer.

Where required for soil separation, a geotextile will be placed below the base.

7.2 Liner Installation Sequence

The overall defined landfill footprint to accommodate 75 years of operation is approximately 22 ha in size. Within that footprint, a total of 12 disposal areas or cells (to be confirmed during site development) have been identified. The first designated cell in the overall sequence, Cells 1, is scheduled for installation during the 2022/2023constructions seasons.



LINER SYSTEM SCHEMATIC

NTS

DILLON CONSULTING	PROJECT: IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL	PROJECT NO.: 19-9543
DATE: AUGUST 2022	TITLE: LANDFILL LINER SCHEMATIC	FIGURE NO.: 7-1

FileName:c:\pw working directory\projects 2019\50dbc\dms12727\29-199543-02-site-con-liner.dwg

Timing the installation requirement for the next lined area in the sequence is critical. Installation can only be practically completed during the non-winter months and adequate time must be allotted for the development of design documents, tendering and delivery of construction materials. The calculation to determine this timing is linked to defined bale placement requirements. Specific aspects of bale placement are discussed in detail in **Section 8.3**.

Tracking of disposal area utilization is the responsibility of the Manager. The primary elements of the installation timing calculation are as follows:

1. Referring to the Engineering Drawings, determine the remaining space (volume) available for the placement of bales. This estimate must incorporate bale placement requirements including perimeter side slopes and the pre-defined lift installation sequence. For example:
   - Remaining Volume (Vr) = 6,240 m^3
2. Confirm the number of bales of waste per week currently requiring disposal. If significant changes to the current volume of incoming waste are anticipated (i.e., accepting material from a new service area), then this value should be adjusted accordingly. Based on an average bale volume of 1.5 m^3, calculate the weekly bale disposal volume requirement. For example:
   - Bale Volume Requirement (Vbr) = 120 m^3/week
3. Divide the estimate of remaining balefill volume (1) by the weekly bale disposal volume requirement (2) to determine the number of remaining weeks of disposal space. For example:
   - Vr/Vbr = 6,240 m^3/(120 m^3/week)
   - = 52 weeks

If it is determined that inadequate space is available to serve operations until late the following summer (i.e., August), then actions will need to be initiated towards the design and installation of the next lined disposal area in the sequence. For example, if the above sample calculation was completed in January 2026, the expectation would be that available balefilling space would be exhausted 52 weeks later in January 2027. Therefore, construction of the next disposal area would be necessary during the summer of 2026.

8.0 Waste Receiving, Placement and Sequencing

8.1 Types of Waste

8.1.1 Acceptable Wastes

Any waste disposal option 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 municipal disposal site, 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 Manager shall allow only those materials to be accepted (for processing and/or disposal) at the Landfill and WTS, except for unique circumstances reviewed in consultation with NWB, for which the facility has been designed to accommodate, namely, MSW. Referencing the Environment and Climate Change Canada (ECCC) document Solid Waste Management for Northern and Remote Communities, Planning and Technical Guidance Document, MSW is defined to include *"reusables, recyclables, compostables, and residual waste (i.e., garbage) from homes, businesses, schools, and other institutions."* Concerning the IWMF, this definition includes end-of-life vehicles, large appliances, salvageable metals, furniture, passenger vehicle tires, and C&D materials

The following materials may be received at the site; although, none of the items listed is considered **suitable for routine baling/disposal**. As a result, the Manager will specify in each case an appropriate disposal method and location. The Manager reserves the right to limit the amount of these materials received at any one time, or to define the material as non-acceptable waste and to specify management requirements.

1. Contaminated soils meeting the acceptance requirements of NWB Analytical test results for all candidate materials will be evaluated by the City and NWB. No material will be accepted for disposal until this evaluation has been completed. Subsequent management requirements for accepted soils will be defined on a case-by-case basis, in consultation with NWB.
2. Non-hazardous incinerator ash, fly ash and wood ash when properly quenched and cooled. Large **quantities of ash may require special pre**-treatment before being accepted at the site and may require special disposal methods.
3. Electrical transformer casings on the condition that all oils have been removed consistent with applicable regulations and that the units have been rendered free of potentially hazardous materials. Salvageable casings will subsequently be held at the site's dedicated metals storage area.
4. Biomedical waste originating from human and animal health care facilities, providing it has been autoclaved or incinerated and is packaged according to the Government of Nunavut Environmental Guideline for Biomedical and Pharmaceutical Waste (dated March 2014 or as amended).
5. Carcasses of animals weighing less than 25 kg.

All wastes not specifically fitting into the above categories, and not specified as unacceptable, will be referred to the Manager and NWB for recommendations as to their acceptability and appropriate disposal methods.

8.1.2 Non-Acceptable Wastes

Wastes, which present a danger to the public, staff, infrastructure or the environment at the WTS or Landfill, which require special disposal techniques, and which may interfere with the level of service to the public or are in contravention with regulatory stipulations, 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 Manager's 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 Manager 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 at the Landfill or the WTS are as follows:

1. Explosives or highly combustible materials of any nature.
2. Gas cylinders, unless the valve has been removed and the cylinder properly drained by a professional trained in handling gas cylinders.
3. Radioactive materials.
4. Chemicals and chemical wastes, including sludges from water and wastewater treatment plants and other generators.
5. Any hazardous materials, which may be classed as corrosive, reactive, toxic or flammable.
6. Carcasses of animals weighing more than 25 kg.
7. Liquid wastes, including herbicides, insecticides or other sprays, paints, oils, and solvents.
8. Septic tank waste and sewage treatment plant sludges, unless a facility is specifically designed for their disposal or they have been pre-treated following the requirements of the Nunavut Water Board and/or other relevant regulatory authority.
9. Fish/meat processing wastes.
10. Hot ashes.
11. Any liquids, or liquid waste, of a quantity greater than 5 L in any one load.
12. Dangerous goods as defined by the *Nunavut Consolidation of Transportation of Dangerous Goods Act* (e.g., poisonous substances, infectious substances, oxidizing substances).

13. Biomedical wastes that are not treated before disposal according to the Government of Nunavut Environmental Guideline for Biomedical and Pharmaceutical Waste (dated March 2014 or as amended).
14. Any other materials not listed as acceptable or conditionally acceptable with the approval of the Manager.

8.2 Waste Receiving and Processing

8.2.1 Waste Inspection and Control

All waste arriving at the WTS is subject to inspection for unacceptable materials (see **Section 8.1.2**). Inspections shall be conducted at the Scale House, on the tipping floor of the WTS, and at the specified material drop-off locations within the WTS yard. It is the responsibility of employees at the Landfill and WTS to be aware of acceptable wastes, and those that are unacceptable or hazardous to the staff and the general public.

The **fi**rst opportunity for waste inspection and control at the WTS occurs at the Scale House, where the following procedures shall be employed:

- All incoming vehicles are required to report to the Scale House. Small, private residential haulers (i.e., cars or ½ ton pickup trucks) are directed to the small vehicle drop-off area located on the south wall of the tipping floor (Door #2). Larger residential-source loads (i.e., ¾ ton pickup trucks, trailers) and all commercial waste haulers are weighed, charged based on the standard per tonne tip fee, and directed to the tipping floor for disposal (Door #1). Further details on incoming traffic flow are provided in Section 8.2.2.
- At the Scale House, all incoming loads are recorded using a computer-based tracking and billing system. Information collected includes waste type, origin and weight. Scale information is collected for materials destined for the WTS tipping floor, WTS material segregation areas and the Landfill.
- Incoming waste is subject to visual checking at the Scale House at the direction of the Facility Supervisor. A high-mounted video camera is provided at the Scale House for spot checks.
- The Scale House Operator shall advise the Facility Supervisor of any observed unacceptable waste.

The second opportunity for waste inspection control exists on the WTS tipping floor and at the specified material drop-off locations:

- Equipment operators and other staff will remain vigilant for unacceptable or potentially hazardous wastes during unloading, conveyor loading, and baling.
- All site operations personnel shall receive training to assist in recognizing unusual, unacceptable and hazardous wastes.
- When a staff member encounters suspect waste on the tipping floor, baling shall cease until the material is segregated and appropriate action (as identified in the Section 8.2.2) is taken. Similar action is to be taken if suspect waste is identified at one of the specified material drop-off locations

within the WTS yard. The procedures outlined in the facility's Emergency Response Plan (ERP) (see Appendix B) may apply if the waste is suspected to be hazardous.

In addition to these methods, thorough random checks may be performed on the tipping floor at the discretion of the Facility Supervisor:

- The Scale House Operator will inform the hauler that a random check is to be performed. If the hauler refuses, the vehicle will not be permitted entry to the site and will be selected for a check on its next visit. The Scale House Operator will record, as much information as possible, about haulers who refuse a random check.
- The selected hauler will be directed to an area on the tipping floor that is separate from all other incoming waste. Before dumping, the driver of the inspected vehicle will confirm the absence of unacceptable materials. An inspector (the Facility Supervisor or a designate) will examine the load for hazardous or unacceptable wastes.

8.2.2 WTS Site Traffic Flow

As noted in **Section 8.2.1**, all vehicles delivering waste materials to the WTS site will be required to report to the Scale House prior to proceeding to designated drop off locations at the facility. As depicted on Figure 8-1 and listed below, vehicles will be directed by the Scale House Operator to proceed to the appropriate drop off location(s) depending on the materials being delivered:

MSW

- Commercial Collection Vehicles (e.g., Waste Compactor):
  - Directed to WTS Drop Off Door #1;
  - Back on to the WTS tipping floor to discharge load as directed by the Traffic Controller/Utility Worker or designated staff member;
- Residential Generators (e.g., Car, Pick Up Truck, Utility Trailer):
  - Directed to WTS Drop Off Door #2; and
  - Unload materials by hand onto WTS tipping floor.

Miscellaneous Metals and Tires

- All Vehicles:
  - Directed to the designated drop off areas in the eastern corner of the WTS property.

Construction and Demolition (C&D) Debris*

- All Vehicles:
  - Directed to the drop off area (including designated 40 cy roll off bins) in the northern corner of the WTS property; and
  - Definition of defined storage areas for select segregated materials (e.g., clean wood) at the discretion of the Manager of Solid Waste.

*: The acceptance of large quantities of mixed C&D materials (e.g., associated with a building demolition) will require written notification to the City of Iqaluit a minimum of two weeks in advance of delivery. Notification, at a minimum, should include contractor name, material source, material types and approximate quantities and requested delivery date(s). Following weighing at the WTS, these materials will require direct haul by the generator to the Landfill for placement/disposal within the active balefill area.

Household Hazardous Wastes (HHW)

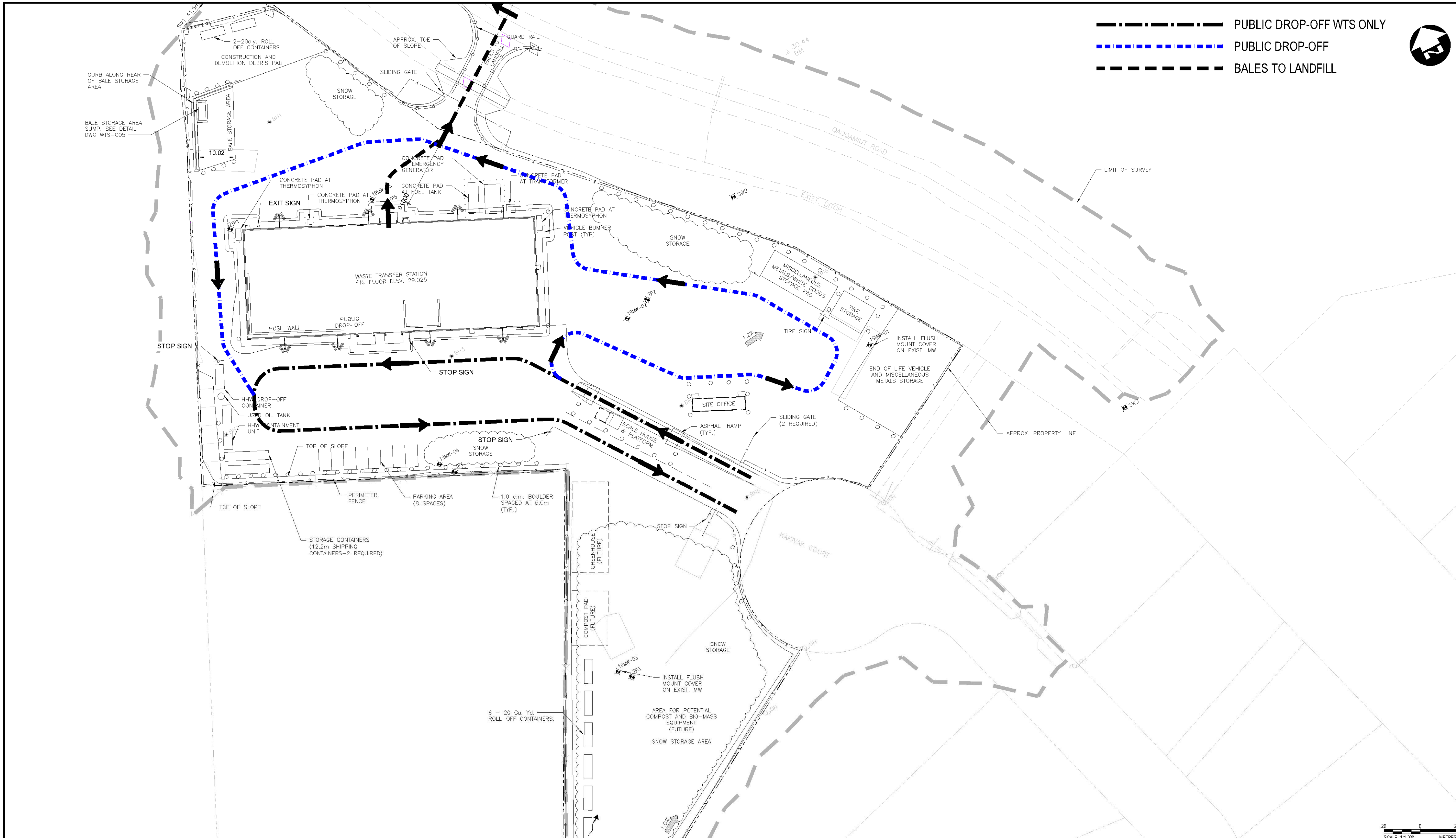
- Residential Generators Only:
  - Directed to the HHW Depot area in the western corner of the WTS property; and
  - A properly-trained WTS staff member should be at the HHW Depot to accept/record delivered materials as required.

It is recommended that commercial haulers/collectors have a tare weight for their vehicle(s) recorded at the Scale House thus requiring weighing upon arrival at the site only. Other delivery vehicles will be required to be weighed both upon arrival and departure to allow for recording and billing as appropriate. It is acknowledged that weighing upon exit will necessitate additional traffic control requirements at the Scale House area.

8.2.3 Handling Unacceptable Waste

Unacceptable wastes may be classified as non-hazardous, potentially hazardous or unacceptable, and, depending on the time of discovery, may or may not be associated with a known hauler. The following outlines appropriate procedures for handling unacceptable waste:

- Non-hazardous, unacceptable waste delivered by a known hauler will be reloaded by the hauler, if necessary, and removed from the site.
- Non-hazardous, unacceptable waste delivered by an unknown hauler may be removed from the site, processed to render it acceptable, or accepted as a special circumstance at the discretion of the Manager.
- Suspected hazardous (and therefore unacceptable) waste delivered by a known hauler will be reloaded by the hauler, if necessary, and removed from the site. The responsible site staff will complete a Waste Inspection/Attempted Delivery of Hazardous Waste Form, included in Appendix A, and inform NWB of the attempted delivery.
- If reloading or further transporting of the suspected hazardous waste is considered unsafe, NWB will be contacted for direction. Costs associated with the attempted delivery will be borne by the hauler and they shall be notified that they will be financially responsible for removal of the waste.
- Suspected hazardous waste delivered by an unknown hauler (i.e., discovered at the site) will be transferred, as directed by the Manager to a portion of the tipping floor designed for storage of suspected hazardous waste. The waste will be tested by a qualified firm at the discretion of NWB and the final disposal options determined based on the results.


PUBLIC DROP-OFF WTS ONLY
PUBLIC DROP-OFF
BALES TO LANDFILL
2-20c.y. ROLL OFF CONTAINERS
CONSTRUCTION AND DEMOLITION DEBRIS PAD
CURB ALONG REAR OF BALE STORAGE AREA
BALE STORAGE AREA SUMP. SEE DETAIL DWG WTS-C05
BALE STORAGE AREA
10.02
SNOW STORAGE
APPROX. TOE OF SLOPE
SLIDING GATE
GUARD RAIL
QAQQAMIUT ROAD
EXIST. DITCH
LIMIT OF SURVEY
CONCRETE PAD EMERGENCY GENERATOR
CONCRETE PAD AT FUEL TANK
CONCRETE PAD AT TRANSFORMER
CONCRETE PAD AT THERMOSYPHON
EXIT SIGN
CONCRETE PAD AT THERMOSYPHON
VEHICLE BUMPER POST (TYP)
WASTE TRANSFER STATION FIN. FLOOR ELEV. 29.025
PUSH WALL
PUBLIC DROP-OFF
MISCELLANEOUS METALS/WHITE GOODS STORAGE PAD
TIRE STORAGE
TIRE SIGN
INSTALL FLUSH MOUNT COVER ON EXIST. MW
END OF LIFE VEHICLE AND MISCELLANEOUS METALS STORAGE
STOP SIGN
STOP SIGN
SITE OFFICE
HHW DROP-OFF CONTAINER
USED OIL TANK
HHW CONTAINMENT UNIT
SCALE HOUSE & PLATFORM
ASPHALT RAMP (TYP.)
SLIDING GATE (2 REQUIRED)
APPROX. PROPERTY LINE
STOP SIGN
TOP OF SLOPE
SNOW STORAGE
TOE OF SLOPE
PERIMETER FENCE
PARKING AREA (8 SPACES)
1.0 c.m. BOULDER SPACED AT 5.0m (TYP.)
STORAGE CONTAINERS (12.2m SHIPPING CONTAINERS-2 REQUIRED)
STOP SIGN
KAKIVAK COURT
GREENHOUSE (FUTURE)
COMPOST PAD (FUTURE)
SNOW STORAGE
INSTALL FLUSH MOUNT COVER ON EXIST. MW
AREA FOR POTENTIAL COMPOST AND BIO-MASS EQUIPMENT (FUTURE)
SNOW STORAGE AREA
6 - 20 Cu. Yd. ROLL-OFF CONTAINERS.
SCALE 1:1,000
METRES

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Iqaluit ᐃᖃᓗᐃᑦ	DILLON CONSULTING	PROJECT IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL	PROJECT NO. 19-9543
	DATE AUGUST 2022	TITLE TRAFFIC PLAN	FIGURE NO. 8-1

Depending on the nature and condition of the suspected waste, safe transfer to the holding area, may not be possible. NWB is to be contacted for direction. The costs will be borne by the City.

Further procedures for handling unacceptable and/or suspected hazardous wastes are provided in the ERP for the Landfill and WTS (see Appendix B).

Once a waste is suspected to be hazardous, the onus is on the hauler to demonstrate otherwise or remove the waste, at their expense. Repeat deliverers of unacceptable or hazardous wastes may be banned from the site at the discretion of, and for a period determined by the Manager and/or the City.

8.2.4 Waste Baling

Following the completion of inspection procedures, material on the tipping floor is pushed using a front end loader to the conveyor infeed. The rate of material transfer from the conveyor to the baler hopper is regulated by the Baler Operator. Similarly, the Baler Operator controls the hydraulic rams, wire tying device and bale wrapper associated with the baler.

Following ejection from the baler, the bales are transferred (utilizing a forklift) to a flatbed truck for transport to the balefill.

8.3 Waste Placement and Covering

8.3.1 Waste Placement

Utilizing the Landfill's access road, bales of municipal solid waste will be delivered by site personnel from the WTS to the active disposal area. With the possible exception of loads of unique or difficult wastes, waste delivery vehicles and/or the general public will not have access to the Landfill area.

The Landfill is constructed from a series of individual lifts. Bales are removed from the flatbed truck via a fork-equipped front end loader. A lift is constructed by stacking bales three to four high; the height limit being set by the reach limit of the front end loader. The total height of a four bale lift is approximately 3 m. During bale stacking, the bales are placed with their widest dimension perpendicular to the direction of balefilling. Processed (shredded) or modest-sized C&D materials can be placed in bale voids on perimeter side slopes with granular fill subsequently being placed to develop a base for the final landfill cap.

To address the potential requirement (due to the temporary unavailability of the WTS baler) to accept unbaled MSW at the Landfill, it is recommended that the material be placed in a constructed void space (e.g., not placing bales in a designated area to establish a shallow "disposal pit") within the active bale placement area – as depicted in Figure 8-2. A thin layer of aggregate cover (e.g., 100 mm) can then be placed over the material to prevent the potential for blowing litter. Depending on the size of the void, City construction equipment (e.g., excavator, tracked dozer) would be used to compact the waste.

Should the waste abrade/breach the plastic wrap of the bales within the void space, it will be inconsequential as the bales will be below grade and covered by waste and aggregate cover. A similar containment approach can be used for C&D debris that presents a blowing litter potential. As an alternative, should the baler be inoperable for an extended period, the site could be temporarily operated as a traditional landfill, with waste being placed over a larger horizontal area (e.g., 300 m^2 with individual lifts of 400 to 600 mm) and then compacted with a bulldozer or (if available) the North 40 landfill compactor. To address concerns of blowing litter, a 100 mm cover layer of aggregate would need to be placed over the final waste lift at the end of each day.

To allow for a minimum four (horizontal) to one (vertical) side slopes for the fill area, the bales must be staggered during placement, utilizing the arrangements shown in Figure 8-2. The required side slope is attained, while still providing efficient usage of the available disposal volume. The staggered arrangement should be maintained until the final design elevation is reached.

The horizontal top cover should be placed to provide between 2% and 4% grade. A minimum side slope of 1% should also be established on the horizontal surface towards the passive vertical faces to direct runoff away from the working face.

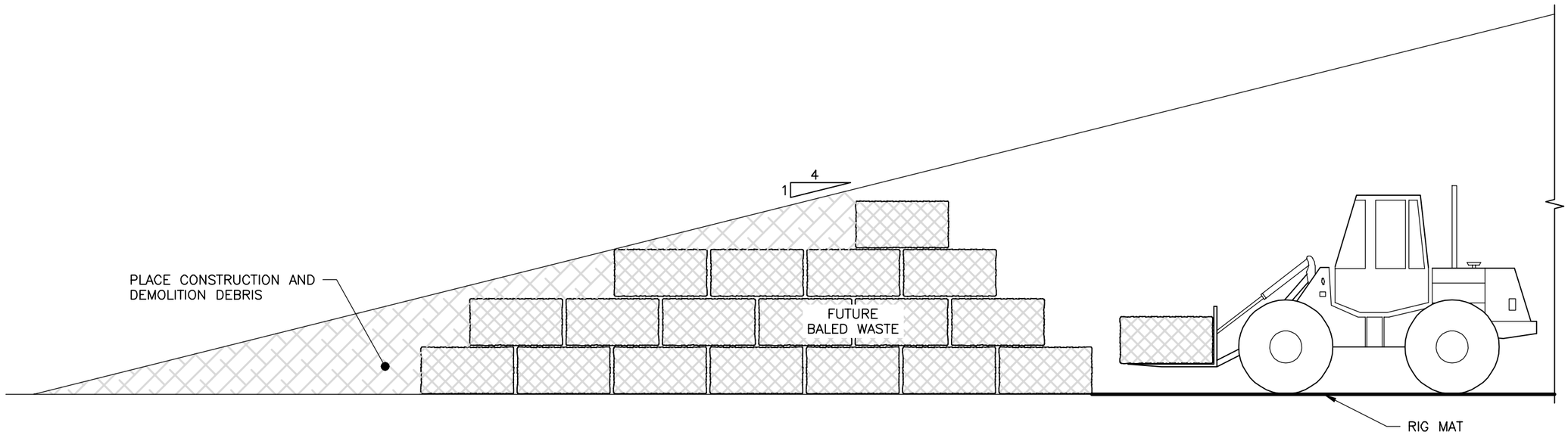
Elements relating to the progression of solid waste balefilling at the facility are illustrated on the Engineering Drawings. The Landfill area development follows a sequence of composite liner installation within a specified disposal area, the orderly placement (or stacking) of cells of baled solid waste within the disposal area, installation of composite liner in the next required disposal area, and the repeat of the process until final grades are reached and the area is capped.

The staged, sequential development of the individual cells within the balefill area serves as the primary organizing factor in the facility's operation. The sequence established as part of the facility design is based on four main operational requirements:

1. To install the liner sequentially as defined cells.
2. To allow mobile site equipment access to all levels of the fill area.
3. To limit the height of vertical bale faces.
4. To achieve final design height (to allow for the installation of the landfill cap), as soon as possible.

Additional information relating to site development is included on the Engineering Drawings.

As the balefill reaches the final grades proposed on the Engineering Drawings, settlement can be expected. The completed areas should be inspected regularly, and any cracks in daily/intermediate cover or areas of ponding water should be regraded to maximize surface runoff. If necessary, additional cover material should be added to ensure positive surface drainage.



TYPICAL LIFT DETAIL (FOR INFORMATION ONLY)

1:75

DILLON CONSULTING	PROJECT: IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL	PROJECT NO.: 19-9543
DATE: AUGUST 2022	TITLE: STAGGERED BALE PLACEMENT	FIGURE NO.: 8-2

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CH_4 gas is a by-product of solid waste anaerobic degradation. **Section 11.0** describes LFG vent installation and the Engineering Drawings present the proposed location of the vents.

8.3.2 Waste Covering

Acknowledging the baled and wrapped condition of the waste materials, the relatively limited amount of annual precipitation and a lack of available low permeability soil cover, the placement of locally-sourced aggregate cover over the waste bales is required only as a precursor to final capping. In select instances, at the discretion of the Manager, the placement of aggregate cover over a non-typical waste material (e.g., presenting a blowing litter, animal/vector attraction and/or litter generation risk) may be deemed appropriate.

8.3.3 Cover Borrow Areas

As noted in Section 4.2.3, cover material required to support the Landfill's operations, including bale/waste covering and final grading, is scheduled to be acquired from the Northwest Aggregate Deposit.

8.3.4 Inclement Weather

Wet weather operation may require the use of stockpiled crushed rock and (potentially) demolition rubble to maintain road access to the Landfill working face. This function should be undertaken to ensure reasonable access at all times, as required.

During the winter season, snow clearing of the Qaqqamiut Road, Northwest Aggregate Deposit access road and the two landfill components (Landfill and Leachate Management System) will be required. Similarly, ongoing snow removal the WTS access routes, as well as the general yard area, will be necessary. It is acknowledged that extreme snowfall/blizzard events could result in temporary discontinuation of operations at the WTS and/or Landfill.

8.4 Surveying and Horizontal/Vertical Control

The landfill cell and footprint limits will be clearly defined in the field. To aid in the construction of the Landfill, permanent benchmarks have been established for horizontal and vertical control. The locations of these benchmarks are defined as a component of the Engineering Drawings.

As construction of the Landfill progresses, the Manager will utilize grades stakes to ensure that the construction is in accordance with the approved plans. The frequency of the staking is controlled by the size of the site and the volume of waste received. Due to settlement, stakes set on previously filled areas should not be used as temporary benchmarks for future staking. If the stakes are required for a long period, they will be checked and reset frequently.

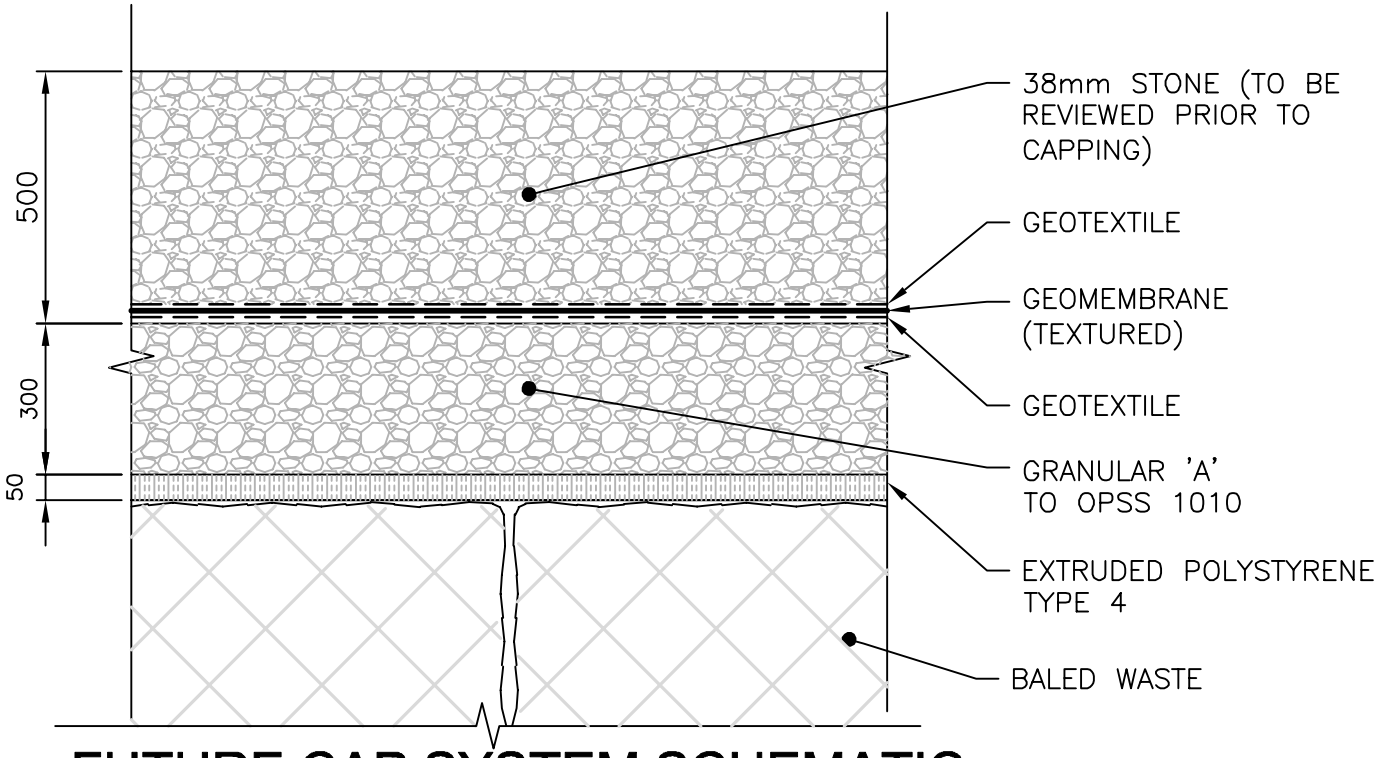
During the application of the final cover, elevation control will be established daily. The required thickness of the final cover will be monitored using settlement plates placed at the top of the waste with painted gradations indicating the required layer thicknesses.

It is the Manager's responsibility to see that all necessary construction staking is accomplished and to apprise the equipment operators of their presence. The Manager will employ or engage the services of a qualified individual(s) to perform the day-to-day operational surveying needs of the site.

8.5 Landfill Cap

Upon achieving final design grades, future infiltration of precipitation into the waste mass (and thus the leachate collection system) will be mitigated through the installation of a landfill cap. The cap, as illustrated in Figure 8-4, consists of a surface drainage layer (450 mm of 75 mm clear stone) geomembrane barrier (60 mil textured LLDPE). Nonwoven geotextile is positioned above and below the geomembrane to provide protection during construction and closure activities.

As described in **Section 11**, vents will be installed at select locations in the final cap to allow for the release of LFG.



FUTURE CAP SYSTEM SCHEMATIC

N.T.S.

DILLON CONSULTING	PROJECT: IQALUIT LANDFILL & WASTE TRANSFER STATION OPERATIONS & MAINTENANCE MANUAL	PROJECT NO.: 19-9543
DATE: AUGUST 2022	TITLE: LANDFILL CAP SCHEMATIC	FIGURE NO.: 8-3

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9.0 Nuisance Control

9.1 Litter Control

Litter can be a significant problem at municipal solid waste disposal sites. At the facility, three factors will serve to reduce the problem significantly:

1. All incoming waste (except for periodic bulky materials) will be handled within the WTS.
2. Waste arriving at the working face will be in high-density, wire-tied and plastic-wrapped bales, with deposition occurring in an orderly "stacking" manner.
3. Use specialized placement procedures and use of aggregate cover at the Landfill in instances where delivered waste presents a littering potential (see **Section 8.3.1**).

Acknowledging that a notable reduction in litter generation is expected at the City's site (over that associated with a standard landfill), a litter control program will still be maintained at this location. Litter control is best accomplished by a combination of proper disposal operations, litter retaining fences and a litter picking program. A clean, litter-free appearance will be maintained at the site at all times, not only for public relations but also for the efficient operation of the Landfill. Poor litter control would attract unwanted wildlife and contribute to surface drainage problems by blocking ditches and culverts.

In summary, litter control measures to be implemented at the Landfill and WTS include:

- Semi-permanent litter collection fencing shall be positioned around the active area to catch blowing litter (see Engineering Drawings);
- A vigorous litter collection and patrol program shall be directed by the Manager;
- Litter on fencing, on-site roadways, in ditches, in the WTS yard, and adjacent properties shall be monitored and collected on a minimum weekly basis;
- The arriving waste must be covered according to applicable City bylaws. Vehicles arriving uncovered shall be turned away; and
- Use of specialized placement procedures at the Landfill for wastes that present a blowing litter potential.

With respect to the plastic bale wrap, it is recommended that its durability be monitored by facility staff on an ongoing basis to identify requirements for operational modifications, including applying additional layers of wrap and/or the selection of a different wrap product. This evaluation should be conducted in collaboration with the bale wrapping unit manufacturer.

9.2 Odour Control

Odours will be controlled at the facility by the implementation of the following daily measures:

- Timely removal of waste from the WTS tipping floor (e.g., baled and delivered to the Landfill);
- Short-term storage of waste bales at the designated location within the WTS yard only in exceptional circumstances (e.g., extreme weather events or landfill access issues);

- Gas venting and collection systems (if necessary) shall be established and maintained in good working order (see Section 11.2);
- Leachate springs at the Landfill shall be promptly repaired; and
- Complaints regarding odour shall be recorded (see Appendix A) and acted upon. Complaints shall also be correlated to relevant weather information.

Odour control will also be achieved by routine site inspections to identify and eliminate localized surface water ponding and/or surface water drainage problems. Should odours become a problem, an on-site evaluation will be performed and appropriate remedial actions taken based on the results of the evaluation.

9.3 Dust Control

Due to transport and placement activities at the site, as well as the number of gravel surface roadways, dust control will be an important operational consideration. Dust control measures to be implemented at the Landfill and WTS include the following:

- The site shall be monitored daily during dry weather;
- Vehicle speeds shall be limited on-site to 10 kph within the WTS compound and at the Landfill, particularly during dry periods. Adequate signage shall be posted and limits enforced;
- On-site roads shall be maintained to minimize dust emissions;
- Asphalt surfaces (e.g., scale ramps) shall be routinely swept; and
- Calcium chloride shall be applied to roads, as necessary. The rate of application shall be recorded, using the daily checklists (see Appendix A).

9.4 Vector and Bird Control

Solid waste disposal facilities can attract rodents and birds due to the availability of food and the potential for breeding habitats in the waste. Limiting the availability of food and void space, resulting from the compacted nature of the baled waste, will discourage their habitation.

9.4.1 Vector and Animal Control

Control measures include the following:

- Litter collection shall be conducted daily to mitigate the attraction of vectors and animals;
- If a baiting program is required for rodents, it shall comply with regulatory requirements regarding the use of pesticides; and
- If burrowing animals utilize the leachate holding ponds as habitat, contact Nunavut Department of Natural Resources to determine the safest manner of removing the animals.

Acknowledging the potential risks, all staff assigned to duties at the Landfill shall be properly trained in bear safety.

9.4.2 Bird Control

Control measures include the following:

- Minimize potential roosting areas within the WTS (e.g., using netting and/or landing surface spikes);
- Litter collection shall be conducted daily; and
- If the problem is persistent, a more intensive program shall be initiated, which may involve the use of noise-generating devices.

9.5 Noise Control

All equipment powered by internal combustion engines have mufflers installed and will be maintained following manufacturer's recommendations.

Regular hours of operation at the WTS shall be restricted to a posted schedule acknowledging the use of back up alarms/indicators on mobile equipment.

9.6 Open Burning

Open burning of any material will not be permitted at the Landfill or WTS.

9.7 Indiscriminate Dumping

Waste is to be disposed of at designated areas at the facility (i.e., WTS tipping floor, material storage areas or Landfill) only. When indiscriminately dumped materials are discovered, they are to be immediately relocated to the appropriate designated area.

10.0 Surface Water Management

10.1 General Description

Surface water at the Landfill is conveyed primarily via overland and sheet flow, ultimately concentrating into channel flow to the east of Sylvia Grinnell Territorial Park, at which point it flows southerly toward the Iqaluit Airport, ultimately discharging to the Koojesse Inlet at Frobisher Bay. Runoff from the WTS site follows the City's drainage network in a southerly direction and into Koojesse Inlet.

Surface water for the Landfill and WTS is classified into two categories:

Stormwater from Developed (Disturbed) Areas

- Includes any surface water from the WTS compound, active and non-active portions of the constructed Landfill, outside slopes of berms, access roads and capped areas. This water is collected in ditches and directed prescribed discharge points, as indicated on the Engineering Drawings.

Stormwater from Non-Developed (Undisturbed) Areas

- Surface water from undeveloped areas or right-of-way areas. This water is discharged directly off-site.

It is noted that precipitation coming in contact with waste materials (e.g., baled waste and C&D materials) will be captured within the Landfill's leachate collection system and will enter the site's surface water ditching.

10.2 Control Ditching

Surface water control is provided through permanent WTS compound/Landfill perimeter ditching, as well as interim/temporary ditching. All permanent ditching is designed to accommodate the peak 100 year return period stormwater flow condition. Permanent culverts are designed to accommodate peak 10 year return period stormwater flows. The interim ditching and culverts are capable of handling the peak five year return period stormwater flows generated on the site.

Noting the anticipated lack of fine grained, erodible soils at the Landfill or WTS, sedimentation control has not been identified as an issue of concern for the design of surface water management features. General operational procedures to limit the potential for negative impacts associated with erosion and sedimentation are incorporated in the Construction and Operations, Closure and Post-Closure Environmental Protection Plans for the Landfill and WTS project.

Primary operational requirements relating to the surface water control ditching include the following:

- Stable aggregate cover shall be maintained in the ditches and on other site surfaces;
- Positive flow shall be maintained away from all buildings;
- Ditches shall be maintained to prevent side slopes from sloughing;
- Ditches shall be kept free of debris, as required; and
- Culvert headwalls shall be maintained.

11.0 Landfill Gas Management

11.1 General Description

CH_4 and carbon dioxide (CO_2) are the primary constituents of LFG and are produced by microorganisms within the balefill, under anaerobic conditions. Carbohydrates from paper, cardboard and similar materials are decomposed initially to sugars, mainly to acetic acid, and finally to CH_4 and CO_2. Other components of LFG include non-methane organic compounds (NMOC) and inorganic compounds. NMOC originate from the disposal of aerosols, paints, oils, solvents and similar products in the Landfill. Inorganic compounds, such as hydrogen sulphide, originate from the decomposition of reactive waste products.

LFG generation, including rate and composition, proceeds through four characteristic phases throughout the lifetime of a landfill. The first phase is aerobic (e.g., with oxygen available) and the primary gas produced is CO_2. The second phase is characterized by O_2 depletion, resulting in an anaerobic environment where large amounts of CO_2 and some hydrogen are produced. In the third anaerobic phase, CH_4 production begins, with an accompanying reduction in the amount of CO_2 produced. Nitrogen (N_2) content is initially high in the balefill gas in the aerobic first phase and declines sharply as the Landfill proceeds through the anaerobic second and third phases. In the fourth phase, gas production of CH_4, CO_2 and N_2 becomes fairly steady. LFG is typically described as comprised of 50% CH_4 and 50% CO_2; although, the percentage of each may vary considerably.

The phase duration and time of gas generation varies with site conditions (e.g., waste composition, cover materials, design, anaerobic state), and may also vary with climatic conditions such as precipitation rates and temperatures. Because CH_4 is combustible, it poses a greater risk to safety than CO_2. If vented in an uncontrolled manner, CH_4 can accumulate in enclosed spaces on, or close to, the disposal site. CH_4 gas is odourless, and because its density, is less dense than air. It rises until its movement is restricted by some impermeable medium. For example, in winter, the frozen surface of the ground may block the vertical escape of CH_4, forcing it to move laterally. Also, CH_4 is insoluble in water; therefore, it will not move below the groundwater table. This presents the risk of fire or explosion. Concentrations of CH_4 between 5 and 15% in air are explosive. With proper venting; however, CH_4 gas should not pose an unacceptable hazard. Research has shown that the rate of decomposition in landfills, as measured by CH_4 gas production, reaches a peak within the first two years and then slowly tapers off; although, continuing in many cases, for periods up to 25 years or more. Therefore, CH_4 venting must be accommodated during and after balefill completion.

It is expected that the low average annual temperature, relatively limited amount of annual precipitation and the baled and wrapped configuration of the waste will tend to reduce the intensity of LFG generation at the City's site. Further, migration of permafrost into the waste mass overtime at the Landfill may serve to deter waste degradation altogether. However, it is acknowledged that ongoing

effects associated with climate change (e.g., warmer and wetter weather in the north) could result in increased LFG generation rates in the future.

11.2 Landfill Gas Vents

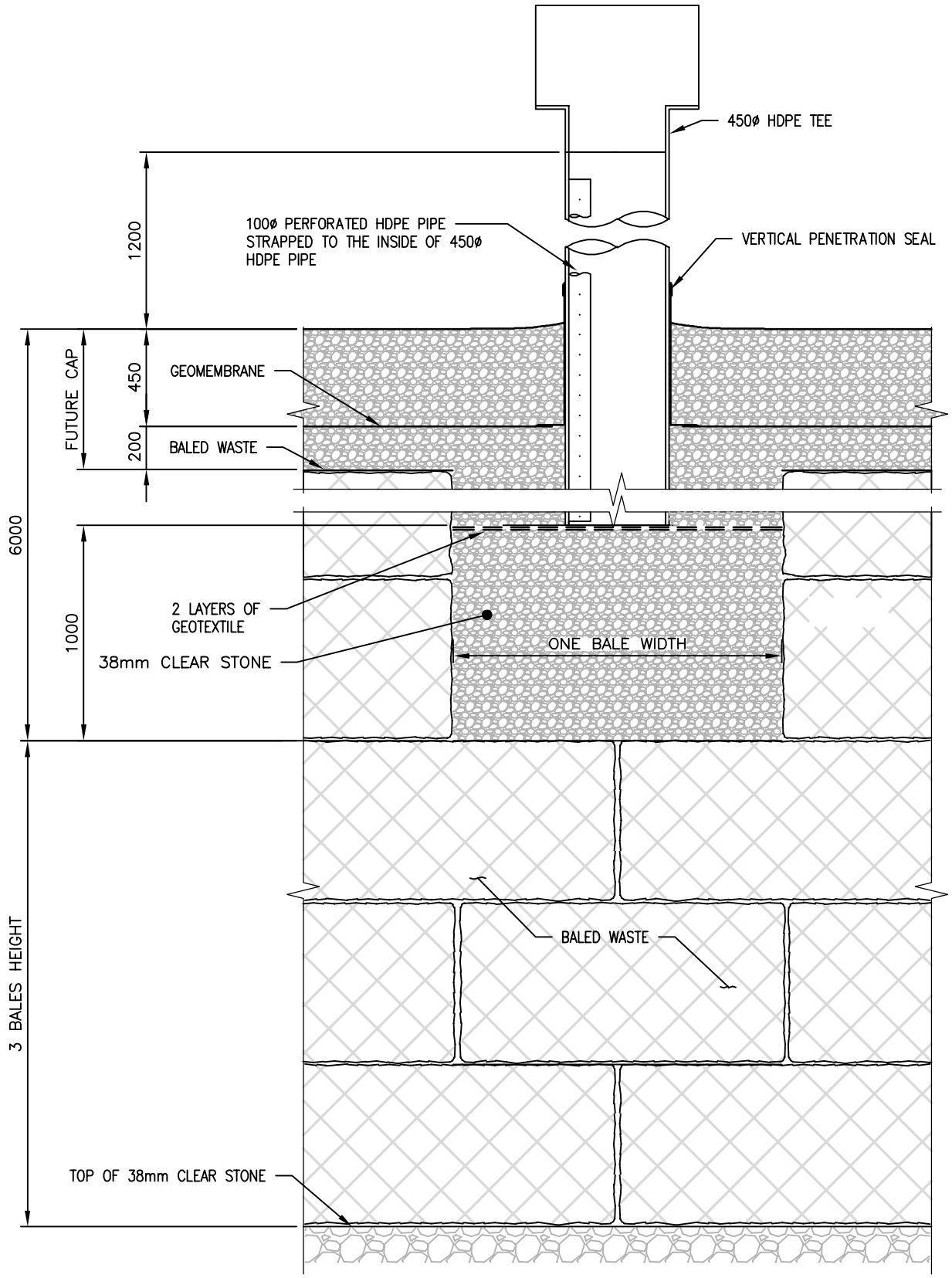
LFG vents will be installed, as specified throughout the fill area, to allow for the controlled discharge of this gas. Suggested locations for these vents are shown on the Engineering Drawings. The vents should be extended in height as the site is developed. Recommended construction details for a typical gas vent are provided in Figure 11-1.

If explosive concentrations of CH_4 are detected during the monitoring program, the ventilation capability of the vent itself, as well as the overall spacing of vents, should be investigated. It may become necessary to consider a positive type ventilation system (such as gas extraction) if the problem is not easily remedied.

CO_2 gas is not considered to present a high risk to safety with regards to above ground operations. However, since it is heavier than air, CO_2 will collect in the bottom of manholes, poorly vented trenches, and other below-ground areas. Therefore, site personnel should take appropriate precautions, such as the use of a respirator or forced ventilation, before entering these areas.

Primary operational requirements relating to LFG control include the following:

- LFG vents shall be installed in the Landfill area, according to spacing identified on the Engineering Drawings.
- CH4 gas detection levels shall be monitored at each vent semi-annually and recorded within a database.
- The area immediately surrounding vents shall be checked periodically for surface water ponding. Regrading shall be conducted, as necessary.
- The structural integrity of the exposed portion of vents shall be monitored periodically to ensure they are maintained.
- The gas vents shall be inspected to ensure that the vent caps are properly fitted and maintained.
- The height of the vents shall be checked to ensure that vents extend a minimum of 1200 mm above grade at all times.
- If measured gas concentrations are within the explosive range, venting capacity shall be evaluated for those vents with explosive readings; alternatively, additional passive vents should be installed.
- If the measured gas concentrations are within the explosive range and the condition is not remedied by modifying the passive vent system, the use of a positive venting system shall be evaluated.



DILLON CONSULTING

DATE AUGUST 2022

PROJECT
IQALUIT LANDFILL & WASTE TRANSFER STATION
OPERATIONS & MAINTENANCE MANUAL

PROJECT NO. 19-9543

TITLE
TYPICAL LANDFILL GAS VENT

FIGURE NO. 11-1

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12.0 Leachate Management

As discussed in **Section 4.0**, leachate is created as a result of operations at the Landfill and WTS. Dedicated collection and storage systems serve each location. Management requirements for both locations are discussed in the following sections. Sampling and analysis requirements associated with leachate management are presented in **Section 13.**

12.1 Waste Transfer Station

Leachate within the WTS is generated during the waste baling process, as liquid is squeezed out of the waste mass. This liquid is collected via a shallow trench in the slab around the perimeter of the baling unit, with the effluent subsequently being pumped to the 4500L sewage holding tank. The holding tank is XLPE polyethylene double wall construction. The secondary (outer) tank has 120% of the capacity of the inner tank and serves as containment in the event of a leak or spillage. The tank is equipped with an interstitial leak detector. As required, this liquid is collected and transported to the City's WWTP for treatment.

A characterization of the WTS leachate shall be conducted to ensure compatibility with the facility's treatment process and infrastructure as defined in *Table 2: Summary of Design Flows and Loads (*Iqaluit WWTP Upgrade Redesign Development Report, prepared by Stantec, November 2017). A record of details related to the transport of leachate to the WWTP or, if required based on the characterization, to the Landfill's Leachate Lagoons (e.g., date, and quantity and/or quality) shall be maintained at the WTS.

12.2 Landfill

The Landfill's leachate collection and management system, as described in **Section 4.2**, will initially incorporate several components, including the leachate collection layer, collection sumps/manholes and retention and potential future bioreactor pond. For the first few years of landfill operations, leachate will be stored within the constructed pond system, allowing for the analysis of quality and quantity data towards defining a treatment system (potentially incorporating mechanical components) appropriate to the unique effluent characteristics of the Iqaluit site.

WARNING!

LEACHATE IS POTENTIALLY HAZARDOUS.

Take appropriate safety precautions when handling or working near leachate or when entering confined spaces, such as the use of protective clothing, breathing apparatus and ventilation.

For the initial system, primary operational requirements relating to leachate management at the Landfill include the following:

- As leachate is generated and pumped to the new holding lagoons, Dillon recommends that weekly sampling be undertaken for the first three months, switching to monthly sampling afterward, should sampling results stabilize:
  - If the quality varies significantly, more frequent sampling should be undertaken to properly identify the raw leachate quality.
  - The parameters that should be examined (at a minimum) are:
    - cBOD
    - BOD
    - COD
    - TSS
    - Particle size distribution
    - TKN
    - TP
    - pH (field)
    - Temperature (field)
    - Total chlorine
    - Total phenols
    - Unionized ammonia
    - Total ammonia
    - Oil & grease,
    - Total dissolved metals
    - Total metals
    - Total coliforms
    - Fecal coliforms
- A summary of the landfill leachate management system activities shall be included in each annual report. This summary shall include, at a minimum:
  - Landfill leachate generation rates;
  - Leachate characteristics;
  - Holding pond capacity; and
  - Any updates to the leachate management system and/or leachate management activities.
- During the summer months (e.g., mid-June to mid-September), the leachate collection manhole will serve as a location for the extraction of effluent using a portable pump, floats, and hosing/piping. During the period of operation, facility staff will be required to monitor effluent depths in the manhole on a daily basis, operating the pump as necessary.
- The pump hosing will direct leachate to piping which will direct flows to the lined ponds. The two ponds have been designed to provide approximately two years of storage, eliminating the need for discharge during the facility's initial operational period based on anticipated rainfall amounts. The pump will be powered by a small portable generator. Staff will bring the portable pump, hosing and generator to the site each morning and energize the system. Before leaving the site at the end of the day, the equipment will be disconnected and returned to the WTS for storage.

- The manhole pump system will be operated during the period of the year when leachate is being generated and flows into the manhole. Daily assessment of leachate generation status (e.g., observations within the manhole) shall commence in the late spring, confirming when active pumping efforts should be initiated.
- A complete inspection of the leachate collection system elements (manhole, pump, hosing, holding ponds) shall be conducted on an annual basis.
- Should it be determined that storage volumes within the ponds are nearing design capacity as measured by water levels in the ponds and corresponding capacity chart, the City, in consultation with the NWB, will access contingency actions including transporting quantities of leachate effluent via pumper truck from the site to either the West 40 landfill (e.g., controlled discharge through the existing waste mass) or the City's WWTP. As a secondary contingency (to be implemented only with the approval of NWB), a valved discharge manhole at the second storage pond will allow for the controlled release of effluent to a gravel bed diffuser. It is acknowledged that it is anticipated that implementation of the secondary contingency measure will necessitate additional environmental effects (e.g., surface water) monitoring requirements at the Landfill site.
- In the event of significant volumes of poor quality leachate that cannot be stored in the holding ponds, three options are available:
    1. Haul and dispose of at the West 40 site;
    2. Haul and dispose of at the City's WWTP (acknowledging the potential impacts to the WWTP process if the strength is significantly above the plant's rated capacity. If this is the case, it may need to be diluted and discharged over an extended period of time;
    3. Discharge to the level spreader under the approval and monitoring of the NWB.
- When treatment equipment is required to be taken offline for short duration maintenance, there is sufficient storage capacity in the holding ponds to accommodate. However, this leachate will need to be re-pumped through the mechanical system once it is back online.

13.0 Site Monitoring

As described in **Section 4.2.6**, environmental effects monitoring requirements at the Landfill and WTS are defined in the latest version (under separate cover) of the Landfill and WTS Facility Monitoring Program (FMP).

14.0 Thermal Effects Mitigation

The operational thermal effects mitigation plan shall be based on the results of the waste/soil temperature measurements conducted during bale placement. The measured waste/soil temperatures and predicted trigger temperatures (heat fluxes) will serve as basic data to determine if heating of the waste material occurs as a result of decomposing of the waste material under anaerobic conditions. The detailed mitigation plan is to include the following required steps:

Step 1: A program to monitor methane emission over the active cell(s).

Step 2: A series of geothermal analyses will be carried out and values of the heat flux will be determined for various depths and parts of the active cell(s) impoundment(s).

Step 3: The volume of water at the given temperature will be determined by geothermal analyses to decrease the waste material temperature which will be sufficient to eliminate heat release of decomposing waste material.

Step 4: The number, location, and depth of boreholes with perforated piping, to deliver required volumes of water for various depths and parts of the active cell(s), will be determined based on information collected in Step 3.

Step 5: Complete earth work to provide access for the drill rig to locations of the bore holes (where required) and drill necessary bore holes.

Step 6: A water line will be placed to each hole and water volume determined by the geothermal analyses (Step 3) will be pumped into the holes.

Step 7: To determine cooling trends which should follow the elimination of heat release due to waste decomposing, thermistor cables for bale/soil temperature measurements will be installed in the boreholes and advanced through entire depth of the bales.

Step 8: To speed up the cooling trend, placement of insulation (in summer time) or snow removal (in winter time) may be required over the active cell surface.

Step 9: The details of the steps will be documented in a mitigation plan, which will include access roads for the drill rig and water trucks, casing design, layout of boreholes, thermistor cable requirements, insulation placement, and snow removal, to be developed by a consultant engaged by the City of Iqaluit.

15.0 Facility Records

Maintaining facility records is important for operational decisions related to both daily activities and long-term facility management. Copies of all records shall be kept at the WTS Office and up-to-date for inspection subsequent reporting purposes. The following records should be maintained as a minimum. It is noted that the daily and weekly checklists discussed in this section (and presented in Appendix A) provide an efficient and concise means to maintain an operational record:

1. **Incoming Material Quantities** – All materials entering the WTS are weighed before subsequent handling. A computerized database serves to consolidate all collected information by source and material type allowing for subsequent reporting. Weigh scale information can be used for determining waste compaction values, soil to waste ratios, trends in waste generation and general quantification of the waste stream.
2. Site Visitor Log – All visitors accessing the Landfill or WTS are to be registered in the site visitor log (see Appendix A). The logbook will be held at the Scale House.
3. Correspondence – A filing system shall be maintained to keep any correspondence associated with site operation.
4. Financial – Complete records of budget forecasts and actual expenditures must be maintained for the operation. This information is to be summarized in an annual report, as well as forecasts for the upcoming year.
5. **Site Operations Log** – The site log will consist of the daily and weekly checklists (see Appendix A), as well as periodic print-offs (i.e., monthly) of Scale House records. Other operations forms, including weather logs, waste inspection forms, complaint forms, can also be incorporated into the site log. It is recommended that the log itself take the form of a binder, allowing for the easy addition of documentation. The landfilling log will be held and maintained by the Manager.
6. Weather – Records relating to temperature, wind conditions and precipitation shall be recorded daily, using a standardized form (see Appendix A).
7. Liner – When landfill cell liner installation is required, a topographic survey of the base area shall be performed before liner construction. The area to receive the liner shall be graded according to the dimensions and elevations shown on the Engineering Drawings. Installation of the liner system shall be undertaken by personnel/firms experienced in the application of the specified materials. Installed sections of liner shall be tested for quality control, as indicated in the specification. Record engineering drawings of the area shall be prepared each time the liner is installed. Inspection records documenting quality control during liner installation shall be maintained by the City. A section of liner capable of accommodating one year of landfilling shall be installed at a minimum. The determination of timing requirements associated with the installation of the liner system is discussed in **Section 7.2**. A sketch of the location of landfilling, with respect to the liner, shall be developed on an annual basis.
8. **Compaction Control** – To monitor site operations on a yearly basis, overall compaction of the balefill shall be examined. A topographic survey of the active soil borrow area and the active Landfill area shall be conducted annually to determine the volume occupied. Survey drawings generated, as part

of this undertaking, shall provide an annual record of site development. Using the weigh scale records, as well as the overall degree of compaction of the balefill, shall be determined.

9. Landfill Cap – When an area reaches final design elevation, a topographic survey shall be conducted to establish final grade. Similar to the disposal area liner, the landfill cap installation shall be undertaken by experienced, qualified personnel with quality control testing being completed, as noted in the specification. All landfill cap installations shall include the completion of record engineering drawings. Other features that shall be noted on the record drawings including leachate collection system elements and surface water runoff ditches. The requirement to install or cap an area shall be forecasted at least 12 months in advance of design and construction for the cap.
10. Leachate Control – Documentation shall include leachate quality test results, sketches showing the progress of installation of the Landfill leachate collection network, leachate pumping and volumes. A record of dates, volumes and any testing data for baler leachate transported from the WTS to the City's WWTF (or other approved facility) shall also be maintained.
11. LFG Control – Documentation associated with the development of the gas vents (if deemed necessary) within the Landfill area, including locations of the gas vents/gas recovery infrastructure and data on periodic gas sampling, shall be maintained.
12. **Surface and Active Layer Water Monitoring** – A database of all surface and active layer (groundwater) monitoring results, including water quality and monitoring point integrity information, shall be maintained.
13. Bird/Pest Control – If control measures are undertaken, all activities are to be recorded on the daily and weekly checklists.
14. Reports – As directed by the Director of Engineering and Public Works, written facility reports shall be prepared by the Manager. Annual material disposal/diversion reports, based on site weigh scale records and in accordance with the requirements of NWB, shall also be prepared.

16.0 Summary Schedule of Facility Activities

Section 15 summarizes facility operational (Table 15-1), maintenance (Table 15-2), monitoring (Table 15-3) and reporting (Table 15-4) activities in point form. This section offers a summary of the requirements on a daily, weekly, monthly, quarterly, annual and "as needed" basis for the WTS and Landfill. It is intended for use as a quick reference only and does not encompass detailed information. Supporting sections of this Operations Manual as well as manufacturer's manuals for specific pieces of mobile and stationary equipment should be referred to for further details.

Table 16-1: Schedule of Operations

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
(LF/WTS) Provide initial ERP training to new facility employees.	(LF/WTS) Manager of Solid Waste to conduct a review of the ERP, identifying revisions as necessary.	(WTS) Conduct a building control systems function assessment.	(WTS) Conduct an assessment of the building fire suppression system and facility portable fire extinguishers.	(WTS) Inspect stationary waste processing equipment, including biomass system, baler and conveyors, conducting repairs/ maintenance as required.	(WTS) Maintain traffic access to and around the building compound at all times.
(LF/WTS) Train all site staff in safety precautions for handling and identifying hazardous materials.	(LF/WTS) Review status of staff training requirements, including OH&S, defining subsequent action as necessary.	(LF) Prepare a three-month landfill development work plan noting deviations from the previous quarter's predicted requirements.	(LF/WTS) Assess status of first aid kits situated within buildings and mobile equipment, replenishing as necessary.	(WTS) Inspect HHW storage unit containment sumps. Empty and clean as required.	(WTS) Ensure all incoming waste loads are properly covered and secured.
(LF/WTS) Assess requirement for litter collection.	(LF/WTS) Conduct an ERP simulation exercise.			(LF/WTS) Inspect sediment control features. Repair or replace as required.	(LF/WTS) Ensure acceptability of incoming waste per O&M Manual definitions.
(LF/WTS) Undertake pest and wildlife control measures as required.	(LF/WTS) Assess status of portable fire extinguishers situated within buildings and mobile equipment, recharging as necessary.			(LF/WTS) Inspect drainage features and structures. Conduct repairs/maintenance as required.	(WTS) Divert salvageable/ recyclable materials away from tipping floor to designated storage areas when possible.
(WTS) Based on daily noted volume, co-ordinate pumping of leachate holding tanks (baler area) as required.	(LF) Assess requirement for leachate management system modifications.				(LF) Maintain road access to the landfill working face at all times.
(LF) Install temporary stormwater	(WTS) Assess requirements to ship salvaged/segregated materials by sealift to				(LF/WTS) Ensure the site buildings and gates are locked when

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
ditching, culverts and access roads.	identified management locations.				unattended.
(LF) Maintain a stockpile of 100 m^3 of granular material for wet weather operation. (LF/WTS) Apply dust suppressants on access roads and yard areas.	(LF) Assess requirement to develop the next cell in the landfill sequence, acknowledging time required for design, tendering and construction. (LF/WTS) Review Facility Operations and Maintenance Manual, updating as necessary.		.		(LF) Follow the sequential cell development plan as depicted in the design drawings. (WTS) Access size of snow storage piles within WTS yard, allowing adequate space for additional snowfall events.
(LF) Install liner system following disposal area development plan.					(LF) Minimize areal extent of disturbance within undeveloped portions of the landfill footprint.
(LF) Remove inter-liner stormwater control piping barriers as required.					
(LF) Install final landfill cap as required.					

Table 16-2: Schedule of Maintenance

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
(LF/WTS) Maintain all stationary and mobile equipment following manufacturer's requirements.	(LF) Commission the leachate lift station in the summer to allow for pumping of effluent to the holding ponds.	(WTS) Inspect Site Office water and wastewater system, repairing as necessary.	(LF/WTS) Take inventory of first aid kits for completeness. Replenish as needed	(LF/WTS) Confirm quantity of bale wire and wrap in storage, replenishing as necessary.	(LF/WTS) Inspect site mobile equipment, assessing the need for maintenance or repair.
(LF/WTS) Maintain snow removal, placement of gravel, pothole repair, culvert cleaning, litter control and ditch upgrade of entrance and internal roads.	(LF) Decommission the leachate lift station in the fall before the onset of winter conditions.	(LF/WTS) Check for surface water ponding around buildings, regrading as necessary.	(LF/WTS) Take inventory of safety equipment and PPE. Replenish as needed.	(WTS) Inspect WTS compound ditching assessing need for maintenance or repair.	(WTS) Monitor weather forecasts for significant rain or snowfall events, making appropriate preparations, including fuel for the backup heating and emergency generator and adequate snow storage capacity.
(WTS) Have Site Office wastewater tank pumped with effluent being	(LF) Check for surface water ponding around monitoring wells,		(WTS) Take inventory of operational supplies including lubricants,	(LF) Inspect leachate holding ponds, repairing as necessary.	(LF) Ensure positive surface water drainage (no ponding) within the

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
transported to an approved management location.	regrading as required.		filters and other consumables, replenishing as necessary.		active landfill area.
(WTS) Have the baler leachate collection tank pumped with the effluent being transported to an approved management location.	(LF/WTS) Engage qualified persons to inspect building structures and equipment.		(LF) Inspect Attendant's Trailer, repairing as necessary.		(WTS) Clean (sweep/water wash) interior and exterior areas within the WTS compound.
	(LF/WTS) Ensure site building roof structures are weather tight.		(LF) Inspect areas that have achieved final grade for settlement, repairing as necessary.		(WTS) Record fuel level in heating system storage tanks, replenishing as required.
	(LF/WTS) Lubricate and inspect doors of buildings ensuring that they are weather tight.				(LF/WTS) Check for litter within/adjacent to the WTS compound and the Landfill access road and clean up as required.
	(LF) Examine all monitoring wells for structural integrity.				(LF/WTS) Evaluate the requirement for the establishment or removal of sediment control procedures/ structures.
	(LF) Inspect leachate management system, repairing as necessary.				(WTS) Record volume of water and wastewater in Site Office holding tanks, taking follow up action as required.

Table 16-3: Schedule of Monitoring

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
(LF) Visual monitoring as specified in the Facility Monitoring Program.	(LF) Record static water level depth of all monitoring wells.		(LF) Take samples and analyze at groundwater stations as specified in the Facility Monitoring Program.		(LF) Record liquid levels in leachate holding ponds, confirming ability to accommodate forecasted rainfall events.
(LF/WTS) Wildlife monitoring as specified in the Facility Monitoring Program.	(LF) Undertake a topographic survey of the landfill area, assessing fill compaction		(LF) Take samples and analyze at surface water stations as specified in the Facility Monitoring Program.		

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
	(LF) Compare actual to final design grades.				

Table 16-4: Schedule of Reporting

As Necessary	Annually	Quarterly	Monthly	Weekly	Daily
(LF/WTS) Complaint forms.	(LF/WTS) Facility Operating Report.		(LF/WTS) Summary of Daily Reports.	(LF/WTS) Facility weekly operations checklist.	(LF/WTS) Facility daily operations checklist.
(LF/WTS) Emergency Response Report.	(LF/WTS) Facility Monitoring Plan Report.		(LF/WTS) Summary of Waste Quantities.		(LF/WTS) Record of waste quantities.
(LF/WTS) Form for attempted delivery of hazardous waste.	(LF/WTS) Contingency Plan for Emergency Response.		(LF/WTS) Summary of Hazardous Waste.		
(LF/WTS) Damage waiver for immobilized vehicles.	(LF/WTS) NWB Waste Diversion Report.				
	(LF/WTS) Wildlife Monitoring Reports.				

17.0 Emergency Response Plan

An ERP applicable to operations at the Landfill and WTS is attached as Appendix B.

Appendix A

Forms

City of Iqaluit - Iqaluit Waste Management Facility
Landfill and Waste Transfer Station

Complaint Response Form[1]

Complainant: _____ **Date Received:** _____

Repeat Complainant[2] (Y/N): _____

Address: _____ **Time Received:** _____

_____ **Received By:** _____

Phone No.: _____ **Form Completed By:** _____

Date of Complaint: _____

Time of Complaint and Noted Weather Conditions: _____

_____

Delivery of Complaint: ☐Phone Call ☐Letter ☐Personal Visit ☐Email/text

Nature of Complaint: _____

_____

_____

_____

_____

_____

_____

Suggested Response: _____

_____

_____

_____

Actions Taken: _____

_____

_____

_____

_____

_____

Complaint Received By (Sign & Date): _____

Written Acknowledgement By (Sign & Date): _____

Notes:

1) A blank complaint response form is to be provided to a complainant upon request. The form can then be completed by the complainant and distributed as desired.

City of Iqaluit - Iqaluit Waste Management Facility
Landfill and Waste Transfer Station
VISITORS LOG

Date	Visitor's Name	Company Name	Reason for Visit	Time In	Time Out

City of Iqaluit - Iqaluit Waste Management Facility
Landfill and Waste Transfer Station

WASTE INSPECTION/ATTEMPTED DELIVERY OF UNACCEPTABLE WASTE FORM

PART A – INSPECTION

Date/Time of Delivery: _____

Date/Time of Inspection: _____

Hauling Firm/Vehicle Owner: _____

Driver's Name: _____

Contact Phone Number: _____

Vehicle License Plate: _____

Size of Load (i.e., tonnes, cubic metres): _____

Source of Waste (as stated by Driver): _____

_____

Type of Waste (as stated by Driver): _____

_____

Inspection Location: _____

Inspection Observations: _____

_____

Suspected Unacceptable Wastes? (Yes/No; **If Yes, complete Part B**) _____

PART B – SUSPECTED UNACCEPTABLE WASTE

Suspected Type of Unacceptable Waste: (as stated by Inspector): _____

Action Taken: _____

_____

Comments: _____

_____

	Inspector	**Driver**
Signature:	_____	_____
Date:	_____	_____

Inspector: Write "refused" in space for driver's signature if driver refuses to sign form.

City of Iqaluit - Iqaluit Waste Management Facility
Landfill and Waste Transfer Station

FACILITY WEEKLY OPERATIONS CHECKLIST
to be completed with reference to the Daily Facility Checklists

Checklist for Week Ending: _____ Completed by: _____

Date Completed: _____

Item	Acceptable Condition? (Y/N)	Comments/Action
1. Mobile Equipment		
2. Litter Control		
3. Pest Control		
4. Dust Control		
5. Site Entrances		
6. Site Roads		
7. Scale/Scale House		
8. Office Building		
9. WTS Tipping Floor		
10. WTS Stationary Equipment		
11. WTS General Interior/Exterior		
12. WTS Yard and Ditching		
13. WTS Yard and Ditching		
14. Active Landfill Disposal Cell		
15. Landfill Staff Shelter		
16. Fire Safety Equipment		
17. Health and Safety Procedures		
18. Waste Placement (incl. cell location)		
19. Landfill Perimeter Berms		
20. Leachate Management System		
21. Landfill Surface Water Ditches		
22. Surface/Active Layer Monitoring		
23. Odour Control		
24. Completed Area		
25. Weekly Landfilled Tonnage		
26. Weekly Diverted Tonnage		
27. Unacceptable Loads		
28. Personnel		
29. Complaints		
Other Issues/General Comments:		

Notes:
1. Acceptable Condition – Item/Issue is within guidelines established by the Operations Manual and/or Operating Authorization and/or good practice.

City of Iqaluit - Iqaluit Waste Management Facility
Landfill and Waste Transfer Station

FACILITY DAILY OPERATIONS CHECKLIST
***to be completed daily with Daily Weather Log**

Date: _____

(A) Morning (Beginning of Working Day) Completed by: _____

	Item	Acceptable Condition? (Y/N)	Comments/Action
1.	Mobile Equipment		
2.	Stationary Equipment		
3.	Landfilling Cell		
4.	Site Entrances		
5.	Site Roads		
5.	WTS Buildings		
6.	WTS Yard Area		
7.	WTS Heating Fuel		
8.	Leachate Management System		

Other Issues/General Comments:

Notes:

1. Acceptable Condition – Item/Issues within guidelines established by the Operations Manual and/or Operating Authorization and/or good practice.

(B) Afternoon (End of Working Day) Completed by: _____

	Item	Information
1.	Working Cell Location (note sequence number)	
2.	Total Baled/Landfilled Tonnage	
3.	Major Haulers (names)	
4.	Number of Private Loads	
5.	Number of Commercial Loads	
6.	Total Diverted Tonnage	

Other Issues/General Comments:

City of Iqaluit - Iqaluit Waste Management Facility
Landfill and Waste Transfer Station
DAILY WEATHER LOG

Log Completed on: _____ _____ _____ Time: _____
Day Month Year

Log Completed by: _____

Weather Record for: _____ Next Day Forecast

Temperature: High___C Low___C Temperature: High___C Low___C

Wind Velocity: _____km/h Wind Velocity: _____km/h

Precipitation	Accumulation	Cloud Cover	Precipitation	Predicted Accumulation
☐ Rain	_mm	☐ Sunny	☐ Rain	_mm
☐ Freezing Rain	_mm	☐ Partly Sunny	☐ Freezing Rain	_mm
☐ Snow	_mm	☐ Partly Cloudy	☐ Snow	_mm
☐ Other	_units	☐ Cloudy	☐ Other	_units

Action Required Due to Weather Conditions		
	Personnel Required	**Comments**
☐ Snow Removal		
☐ Road Sanding/Salting		
☐ Dust Control		
☐ Litter Control		
☐ Slope Stabilization		
☐ Ditching		
☐ Equipment Servicing Description _____		
Other (Specify) _____		

Appendix B

Emergency Response Plan

DILLON CONSULTING

CITY OF IQALUIT

Emergency Response Plan (Revised Final)

Landfill and Waste Transfer Station

August 2022 – 19-9543

Table of Contents

Figures

TELEPHONE LISTING

To be posted at the Site Office, Scale House, Waste Transfer Station and Landfill Attendant Trailer
Revision Date: August 2022

EMERGENCY:

General Emergency (RCMP) 867 979 1111

GENERAL:

Fire/Ambulance: 867 979 4422
Police: RCMP (general inquiry and assistance) 867 979 0123

Government Agencies:
Nunavut Department of Environment:
Environmental Emergencies 867 920 8130
Nunavut Department of Community and Government Services:
Emergency Management 867 975 5320
Nunavut Department of Health:
Environmental Health Officer 867 975 4800
After Hours Emergency 867 975 5772
Nunavut Water Board (NWB) 867 360 6338

Administration:
Director of Engineering and Public Works (Matt Hamp) ..... office: 867 975 8509
..... cell: 897 222 2965
Manager of Solid Waste (TBA) ..... 867 979 XXXX
Facility Supervisor (TBA) ..... 867 979 XXXX
Public Works Operations Superintendent ..... office: 867 979 5631
..... cell: 867 222 2956

1.0 Introduction

The purpose of this Emergency Response Plan (ERP) is to provide guidance to facility personnel for responding to an emergency. This document has been prepared as part of an overarching Environmental Management Plan for the City of Iqaluit Landfill and Waste Transfer Station (WTS); this document provides further guidance on responding to environmental emergencies and can be used in conjunction with this ERP. These policies and procedures define how the City of Iqaluit (the City) will protect human health and the environment during the Operations and Closure Phases of the project. The ERP covers all aspects of emergency planning and response including types of emergencies, key contact information, notification processes, emergency procedures, and reporting. Mechanisms for updating the ERP have also been incorporated.

This plan must be reviewed by all employees, as part of their training, and at regular intervals (e.g., every 12 months) during operations.

During initial and future construction efforts at the Landfill and WTS, the primary contractor in charge of construction activities will be obliged to prepare a separate ERP outlining construction-specific hazards and related emergency procedures to be followed by site personnel. Due to changing conditions and the nature of construction operations, the hazards and procedures outlined in the construction phase ERP will differ significantly from those during the Operations Phase.

1.1 Scope of Plan

Location

This ERP applies to the Iqaluit Waste Management Facility (IWMF), including the Waste Transfer Station (WTS) and Landfill, Iqaluit, Nunavut.

Definitions

For the purposes of the ERP, an emergency is defined as any accident, incident, or unplanned event or situation that requires immediate and urgent action to prevent or minimize harm to persons, the environment, or property.

Individuals referred to by their titles, including the Chief Administrative Officer (CAO), Director of Engineering and Public Works (Director), Manager of Solid Waste (Manger), Facility Supervisor and Health and Safety Officer, are all employees of the City of Iqaluit.

Philosophy

No emergency response plan can identify every type of emergency, or predict the details of a given situation. This ERP will provide guidance for specific occurrences at the landfill site, and is designed to be

adaptable for future requirements. The procedures provided here should be implemented with due diligence, based on sound judgement and experience.

Prevention

Proper preventative measures, close monitoring, training, and effective management are the best lines of defence against accidents and emergencies. The most effective method for mitigating accidents and emergencies is through best management practices to reduce the likelihood of an occurrence.

Readiness

All personnel working at the site should be aware of and prepared for events covered in the ERP.

Priorities

The foremost priority of site personnel in the event of an emergency is the protection of themselves and other individuals, as well as the environment. The next priority is the protection of property.

Definition of an Emergency

For the purposes of this ERP, an emergency is defined as any accident, incident, unplanned event, or situation that requires immediate and urgent action to prevent or minimize harm to persons, the environment, or property.

1.2 Individual Responsibilities

It is the responsibility of all site personnel to follow safe practices and to be vigilant and prepared for potential emergencies. Management and individuals in designated roles have further responsibility to enable and monitor readiness.

It is the responsibility of the Manager to:

- Ensure the ERP is accessible and ready to be implemented in the event of an emergency;
- Ensure all staff are trained in the ERP contents and procedures;
- Prepare incident reports in the event of an emergency; and
- Assign the responsibilities of the Emergency Response Coordinator (ERC) to the designated individual or alternative employee.

It is the responsibility of the ERC to:

- Determine the urgency of an identified situation and whether it constitutes an emergency;
- Implement the elements of the ERP;
- Direct the activities of site personnel;
- Delegate responsibility to other site personnel, as required;
- Contact the relevant authorities;
- Inform and consult with the Manager and any other internal stakeholders; and
- Allocate the necessary resources to adequately respond to the emergency.

It is the responsibility of all site personnel to:

- Be familiar with the provisions of the ERP;
- Take direction from the ERC and his/her delegate (as applicable) during an emergency; and
- Be alert for and report the initial signs of potential.

It is the responsibility of the **fi**rst observer of a potential emergency to:

- Rapidly assess any details that may be useful in describing the potential emergency;
- Take any immediate steps that may be safely performed to protect themselves, other persons and the environment, and to protect property, where possible;
- Notify a supervisor, the Landfill Manager and/or the ERC; and
- Wait for further instructions.

For all emergencies, day or night, all employees and contractors should report to the designated Muster Point (see **Section 5**). The Visitor Log, maintained at the Scale House, can be used to verify all employees, contractors and visitors are accounted for.

1.3 Notification Procedures

During an emergency or potential emergency, the chain of authority for designating the Emergency Coordinator is as follows:

If one of these individuals cannot be contacted immediately, the next highest person on the chain of authority should be contacted. Efforts should continue to be made to contact any unavailable individuals even if someone higher in the chain has been notified.

Emergency Coordinator

The Emergency Coordinator is that person highest in the chain of authority who is aware of the emergency and is present at the site. He or she will serve as Emergency Coordinator until succeeded by a person higher in the chain of authority.

If contacted while away from the site during an emergency, all individuals in the chain of authority will take reasonable steps to travel to the site immediately, and remain there until the situation is considered under control.

1.4 Emergency Numbers

The contacts and telephone numbers provided at the front of this document shall be posted near all telephones at the site, and are identical to those found prior to the Operations and Maintenance Manual Table of Contents. These numbers should also be stored on the cellular phones of all site personnel. The numbers are to be confirmed, updated, and reposted annually, with the revision date prominently indicated.

1.5 Levels of Response

Once an emergency has been confirmed and declared by the Emergency Coordinator, the steps outlined in this section will be implemented.

Based on the available information, the Emergency Coordinator will declare a Level III, a Level II, or a Level I emergency as defined below:

Level III: **Continue Working and Monitor Communications**
All personnel are to continue with their duties unless otherwise directed by the Emergency Coordinator, and shall constantly monitor communications for changes in the status of the emergency.

The ERC is to establish contact with all personnel on the site and inform them of the Level III status.

Level II: Gather at Designated Area
All personnel will abandon their duties in a controlled manner, and gather on-site at an area designated by the ERC.

Unless otherwise directed, personal property, including vehicles, is not to be collected.

Level I: Evacuate
All personnel will evacuate at the direction of the ERC, using the designated exit route and meeting at the designated gathering area beyond the site.

The existing communications network used during normal operations at the site will be used in the event of an emergency, including direct contact, two-way radio, or telephone (fixed, mobile, and cellular). Once an emergency is declared, all site personnel are to maintain an open communication line with the ERC at all times.

The on-site gathering areas used during a Level II emergency will normally be located at:

- Landfill:
  - At the intersection of the landfill access road and the Northwest Aggregate Deposit Access Road.
- WTS:
  - Either outside the Scale House or at the main site entrance gate. Any evacuation from the site will normally be conducted via the Kakivak Court with the Qaqqamiut Road gate as an optional evacuation route.

If a Level I emergency is called before a Level II is called or completed, the ERC will announce the evacuation, the exit route and outside gathering area. Personnel will proceed directly to the outside gathering area while avoiding travel over the landfill or near the site of the emergency during the evacuation.

After evacuation, personnel are to remain at the off-site gathering area to be accounted for and shall wait until directed to re-enter the site or to leave.

The primary evacuation routes shall be the following:

- From the Landfill:
  - Via the landfill access road to the Northwest Aggregate Deposit Access Road, continuing to the Qaqqamiut Road.
- From the WTS:
  - Via the main gate to the Kakivak Court, continuing to Federal Road.

During Level II and Level I emergencies, and for as long as the situation is safe, a Gate Monitor will be posted at the main WTS and/or Landfill entrance gate. Non-site or non-emergency personnel (e.g., waste haulers, contractors, visitors, media) will NOT be permitted entry to the site during the emergency. The Emergency Coordinator may also choose to prevent any entry to the site during a Level III emergency. If conditions require the Gate Monitor to abandon the gate, the gate will be closed but not locked.

During Level II and Level I emergencies, the Emergency Coordinator will appoint a Site Clearer to direct non-site personnel to leave the site. The Site Clearer will contact all non-site personnel, record their names and/or license plate numbers, and direct them to leave immediately and to check with the Gate Monitor as they leave. The Site Clearer will then crosscheck the list of names and license plates with the Gate Monitor to ensure that all non-site personnel have left the site.

1.6 Public Relations

All communications with the public concerning the emergency, including media contact, will be conducted by the Manager or designate.

2.0 Types of Emergencies Covered by ERP

This ERP addresses the following emergencies at the City's facilities:

- Medical Emergencies;
- Vehicle Fires;
- Building Fires;
- Landfill Fires;
- Liquid/Chemical Spills;
- Gas Leaks/Suspicious Odours;
- Explosions;
- Extreme Weather Events;
- Power Outages;
- Dangerous Animal Encounters; and
- Violent Criminal Behaviour.

Other emergencies or other occurrences including environmental spills, stormwater impacts, and erosion/sediment control issues are included in the Environmental Protection Plan (EPP).

3.0 On-Site Emergency Equipment

As a minimum, the following emergency equipment and supplies are to be kept at the site at the indicated locations. All personnel are to familiarize themselves with their location and be trained in their operation.

- First aid kits - All mobile equipment and buildings;
- Fire extinguishers - All mobile equipment and buildings;
- Eyewash stations – Waste Transfer Station, Landfill Attendant Trailer;
- Respirators – Waste Transfer Station; and
- Oil absorbent materials - All mobile equipment and buildings.

The Manager is responsible for maintaining emergency equipment and supplies. Equipment Operators are responsible for reporting any deficiencies with safety equipment and supplies associated with vehicles they operate. All site personnel are responsible for reporting observed deficiencies with any safety equipment and supplies.

4.0 Emergency Response Procedures

The following sections identify the recommended response to several contingency situations and emergencies. It can be expected that situations other than those described below may arise from time to time, and should be responded to in a manner appropriate for the emergency situation at that time.

4.1 Medical Emergencies

It is required that at least one member of the Landfill or WTS staff has been trained, and is current in Emergency First Aid and CPR.

In the case of a medical emergency, the staff member with Emergency First Aid Training will be informed and will generally follow the PRIORITY ACTION APPROACH outlined below for life-threatening situations:

- Take charge of the situation;
- Call out for help to attract bystanders;
- Assess the hazards;
- Make the area safe for the First Aiders and others;
- Identify himself or herself as a First Aider and ask the injured party if they can help;
- Assess the casualty for life-threatening conditions;
- Provide first aid for life-threatening conditions;
- Send someone to call for help and notify the ERC;
- Organize bystanders to:
    - Help make the area safe,
    - Ensure that all casualties have been discovered,
    - Call ambulance, police, and other emergency personnel, and
    - Assist with first aid, as directed.

If the casualty has a suspected head or spinal injury, do not move the victim, but carefully steady and support the head and neck without moving the head before establishing responsiveness.

4.2 Vehicle Fires

All collection vehicles and landfill equipment shall be supplied with a fire extinguisher, as well as fire suppression systems in major landfill equipment.

The equipment operator will follow the procedure below in the case of an equipment/vehicle **fi**re:

- Notify the ERC;
- Try to move the machine to an isolated area, but only if it is safe to do so from a personnel perspective;
- Shut down the machine; and

- ONLY IF THE OPERATOR DETERMINES THAT IT IS SAFE TO DO SO, use the supplied fire extinguisher to put out the fire.

The ERC will follow the procedure below in the case of vehicle **fi**re:

- Take direction from the Emergency Services in responding to the fire; and
- Alert the Department of the Environment in the event that the vehicle has the potential to release contaminants to the environment, as a result of the fire and/or contains waste.

4.3 Building Fires

Fire extinguishers are strategically located in all buildings. If the fire is small, persons identifying the fire should try to put it out with a fire extinguisher. If the fire cannot be controlled or is severe when identified, the below procedure below should be followed:

- Notify the ERC and/or the closest Supervisor;
- Evacuate to the designated assembly area or muster point;
- ERC or Supervisor will report the fire to the local Emergency Services;
- Ensure clear access for arrival of Fire Department;
- Inform the Fire Department of any pertinent details of the fire (location, extent, cause, combustible materials, actions taken) and on-site firefighting resources (water supply, heavy equipment); and
- Assist only if, and as directed by, firefighting personnel.

4.4 Landfill Fires

Landfill fires can result from undetected hot loads that are landfilled. The following procedures will be followed upon identification of fire and notification of the Emergency Coordinator.

Assess the Situation. The employee first observing the potential or actual fire will:

- Determine the number, location, extent and possible cause of the landfill fire;
- Notify the ERC and all on-site Landfill staff;
- The ERC will contact the Fire Department, as necessary;
- Provide the Fire Department with as much information relating to the fire and its cause(s), as possible, to assist them in responding appropriately to the situation; and
- If multiple fire locations exist, the ERC will determine, as best as possible, the priority fires for fighting first. In this regard, the ERC will take direction once the Fire Department has arrived.

Prepare for Firefighting. The ERC will assign staff to:

- Prepare an area away from the working face to be clear of vegetation and waste (preferably virgin ground);
- Excavate soil nearby for use in smothering the fire, if insufficient cover material is at hand; and
- Assemble portable pumps and hoses.

Contain the Fire: The ERC will, in conjunction with direction from the Fire Department, assign staff to:

- Construct a fire break, as close to the burning area as possible, to limit surface spreading of the fire;
- Suppress flames with water;
- Push smouldering material to the clear area, while continuing to spray with water; and
- Smother the fire by adding soil and compacting.

Monitor the Situation: The ERC will assign staff to:

- Continue to monitor the fire site and smothered material following the apparent extinguishing of the fire; and
- Leave burnt material isolated and exposed for two days after extinguishing to ensure no subsequent outbreak of fire.

4.5 Liquid/Chemical Spills

The first observer will check the immediate area for any affected or injured personnel and will inform the ERC, as soon as possible.

The ERC will:

- Direct staff to take appropriate emergency environmental protection measures, such as placing booms or barriers around the spill to prevent liquid escape into the environment or into surface water bodies;
- Call the Nunavut Department of Environment – Environmental Emergencies (867 920 8130), if the spilled substance quantity exceeds the minimum notification requirements (refer to the EPP);
- Notify the Department of Environment for the Government of Nunavut;
- In the event that liquids have reached surface water bodies, attempt to prevent further release to minimize the potential effects of the release;
- Take direction from the Department of Environment or their designated authority;
- Attempt to determine the cause of release and whether a risk of a further release exists; and
- Assess and potentially upgrade the level of the emergency, as necessary.

For additional information on spills and releases, please consult the EPP (Section 6.0).

4.6 Gas Leaks/Suspicious Odours

In the event you smell gas and suspect a leak immediately cease all operations. DO NOT SWITCH ON **LIGHTS OR ANY ELECTRICAL EQUIPMENT. Do not turn switches on or off; leave them in the position they are in, as this action can generate sparks.**

- Notify dispatch or the ERC;
- Evacuate the building/equipment by the nearest exit. Notify other building occupants to do so as well;

- Once outside, move away from the building and head to the designated waiting area to await further instructions; and
- Contact the Fire Department, as necessary.

4.7 Explosions

In the event of an explosion in a building, staff should take the following actions:

- Immediately take cover under tables, desks, or other such objects providing protection against flying glass or debris;
- Evacuate the immediate area of the explosion;
- Notify dispatch of the occurrence;
- Seek out and assist injured and disabled persons in evacuating the building. Exit via the nearest safe exit;
- Once outside, move to the designated assembly area;
- Await further instructions. Do not return to the building unless instructed to do so by the ERC;
- Ensure clear access for arrival of Fire Department. Keep roadways and walkways clear for emergency vehicles; and
- The ERC will inform emergency response personnel of any pertinent details of the explosion, such as location, extent, cause, combustible, or flammable materials in the area of the explosion and what actions are to be taken.

4.8 Extreme Weather Events

Extreme weather events might include snow storms, extreme cold warnings, ice storms or extremely high winds. If extreme weather events occur, the following actions will be taken:

- When a weather warning is issued by Environment Canada, the Superintendent of Public Works will consult with the appropriate authorities at Environment Canada to determine the anticipated severity and duration of the weather event;
- The Facility Supervisor will hold a planning meeting prior to a foul weather event to prepare and implement a foul weather action plan;
- Loose materials that can be blown around or damaged will be moved inside or tied down;
- Doors and windows will be secured; and
- Communication equipment will be checked.

4.9 Power Outages

Power outages will affect the operation of any weigh scales, pumping stations and ventilation systems for buildings, in addition to any normal operating systems therein. The loss of power does not necessarily constitute an emergency. Indoor gas detection and alarm systems (such as carbon monoxide monitors on tipping floors) will not be functional during a power outage. The procedure below will be

followed if a power outage exceeds five minutes and alternative ventilation cannot be activated (such as opening truck access doors):

- Staff will evacuate the buildings and gather at the designated assembly area; and
- Building re-entry will be allowed after power has been restored and indoor gas detection alarms are silenced.

It is acknowledged that the WTS is equipped with an emergency generator that should serve to mitigate issues associated with power outages.

4.10 Dangerous Animal Encounters

Certain animals can pose a danger to landfill staff or the public. In particular, polar bears and other bear species can cause serious injury or death as a result of contact with humans, and extreme care should be exercised when a bear is in the area. Bears are attracted to garbage and will readily enter landfills and other areas where garbage is stored in search of food. They can also become habituated to areas where food sources have been previously available.

In the event of a bear encounter, the following measures should be undertaken:

- Notify any and all personnel working in the area, as well as the ERC, of the presence of a bear;
- Contact the relevant authorities, if necessary;
- Do not approach bears for photography or any other reason! This leads to habituation and encourages more frequent encounters with humans; and
- If a bear approaches, a number of deterrents can be used to startle or frighten the bear away:
  - Rubber bullets,
  - Bean bag round,
  - Cracker shells,
  - Scare cartridges,
  - Pen launcher,
  - Pepper spray,
  - Noisemakers, and
  - Warning shots.
- Electric fencing and vehicles can also be effective deterrents to bear encounters.

4.11 Violent/Criminal Behaviour

If you observe a crime in progress or behaviour that you suspect is criminal, immediately notify police at 867 979 1111.

DO NOT APPROACH OR ATTEMPT TO APPREHEND THE PERSON(S) INVOLVED!

The following items are recommendations for dealing with robbery/assault:

- Cooperate, give the person exactly what they are looking for, nothing more;
- Try to notice distinguishing traits, such as clothing, race, height, weight, age, eye colour, facial hair, or other identifying features such as scars, moles, tattoos, eyewear, etc.;
- Pay attention to the type of weapon used, if applicable;
- Listen carefully to their voice for distinguishing characteristics (i.e., an accent, lisp, stutter);
- Record what direction they go after the confrontation. If they use a vehicle, record the licence plate number, and make and model of the vehicle;
- Notify the police by calling 867 979 1111 immediately after the person leaves. Stay on the telephone with the police dispatcher and provide additional information as changes in the situation occur, until the first police officer arrives at your location; and
- Cooperate fully with the police investigation.

5.0 Evacuation Plan

5.1 Evacuation Routes

Figures 5-1 and 5-2 identify evacuation routes and muster points for both the WTS and Landfill. In the event of an emergency where evacuation is required, move quickly and orderly to the muster point or designated assembly area, and await further instruction. Look around at the assembled people to determine if anyone is missing and inform the ERC, emergency services, or others, as applicable.

SECONDARY EVACUATION ROUTE

N7070857.94
E522613.96
EL. 10.44
BM

MUSTER POINT

PRIMARY EVACUATION ROUTE

LIMIT OF SURVEY

APPROX. PROPERTY LINE

QAQQAMIUT ROAD

KAKIVAK COURT

EXIST. DITCH

SW1 41.0m

2-20c.y. ROLL OFF CONTAINERS

CONSTRUCTION AND DEMOLITION DEBRIS PAD

CURB ALONG REAR OF BALE STORAGE AREA

BALE STORAGE AREA SUMP. SEE DETAIL DWG WTS-C05

BALE STORAGE AREA

19.7m

10.0m

SNOW STORAGE

SLIDING GATE

R=10.0m

APPROX. TOE OF SLOPE

GUARD RAIL

22m CULVERT (2100x1500 CSPA)

EXIST. MW TO BE DECOMMISSIONED

CONCRETE PAD AT EMERGENCY GENERATOR

CONCRETE PAD AT TRANSFORMER

CONCRETE PAD AT THERMOSYPHON

CONCRETE PAD AT FUEL TANK

VEHICLE BUMPER POST (TYP)

SWALE

WASTE TRANSFER STATION
FIN. FLOOR ELEV. 29.025

PUSH WALL

PUBLIC DROP-OFF

STOP SIGN

DOWNSPOUTS PROVIDE DISCHARGE 3.0M AWAY FROM BUILDING (TYP)

ALL TRAFFIC LEFT SIGN

INSTALL FLUSH MOUNT COVER ON EXIST. MW

MISCELLANEOUS METALS/WHITE GOODS STORAGE PAD

TIRE STORAGE

TIRE SIGN

END OF LIFE VEHICLE AND MISCELLANEOUS METALS STORAGE

SCALE ELEV. 28.50

SCALE HOUSE & PLATFORM

SITE OFFICE

ASPHALT (TYP.)

SLIDING GATE (2 REQUIRED)

CONSTRUCT SWALE TO PROMOTE POSITIVE DRAINAGE

HHW DROP-OFF CONTAINER

USED OIL TANK

HHW CONTAINMENT UNIT

TOP OF SLOPE

PERIMETER FENCE

PARKING AREA (8 SPACES)

1.0 c.m. BOULDER SPACED AT 5.0m (TYP.)

TOE OF SLOPE

STORAGE CONTAINERS (12.2m SHIPPING CONTAINERS-2 REQUIRED)

GREENHOUSE (FUTURE)

COMPOST PAD (FUTURE)

6 - 20 Cu. Yd. ROLL-OFF CONTAINERS.

AREA FOR POTENTIAL COMPOST AND BIO-MASS EQUIPMENT (FUTURE)

SNOW STORAGE AREA

0+100

0+137

SCALE 1:1,000 METRES

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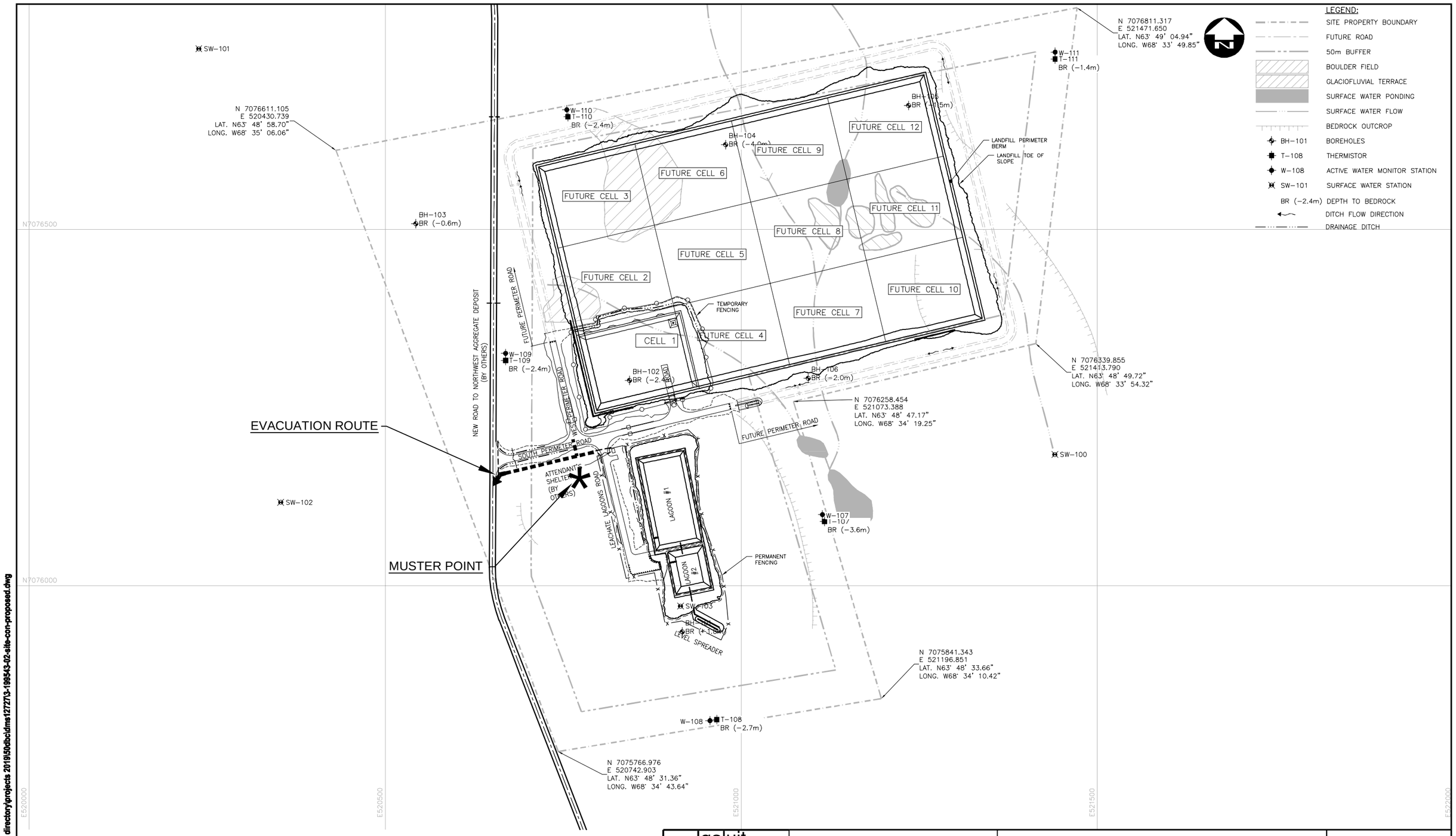
Iqaluit	DILLON CONSULTING	PROJECT: IQALUIT LANDFILL & WASTE TRANSFER STATION EMERGENCY RESPONSE PLAN	PROJECT NO.: 19-9543
	DATE: AUGUST 2022	TITLE: WTS - MUSTER POINT AND EVACUATION ROUTE	FIGURE NO.: 5-1



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Iqaluit

DILLON CONSULTING

DATE AUGUST 2022

PROJECT
IQALUIT LANDFILL & WASTE TRANSFER STATION
EMERGENCY RESPONSE PLAN

PROJECT NO.
19-9543

TITLE
LANDFILL - MUSTER POINT AND EVACUATION ROUTE

FIGURE NO.
5-2

6.0 Emergency Response Plan Distribution and Updating

This ERP will be used as a training tool for all new staff upon hire. The ERP will be easily accessible at both the WTS Office and the Landfill Attendant Trailer. The ERP will be reviewed annually by the Manager of Solid Waste and updated for changes that have occurred over the previous year.

7.0 Post Emergency Review and Plan Assessment

Following an accident or incident outlined within the ERP, a review of the effectiveness of this plan will be conducted to identify any areas of improvement, if applicable. This assessment should be conducted by the Director of Engineering and Public Works, the Manager of Solid Waste and any other affected parties. Any improvements identified during this meeting should be made to the ERP, as soon as practicable, to ensure more effective emergency response if future incidents occur.

8.0 Readiness Review

8.1 Emergency Reporting

Brief but accurate records will be kept during an emergency situation by the ERC. This will assist in later analyses, reporting and plan revisions. Within five working days of the resolution of the event (i.e., when the event is no longer an emergency), the Director of Engineering and Public Works will provide the Nunavut Impact Review Board with a brief written report concerning the emergency. This report will include:

- An account of the circumstances that caused the emergency;
- An account of events during the emergency, including chronology;
- The current status of the site with respect to the emergency; and
- Measures to be taken to minimize similar occurrences.

An evaluation of the performance of coordinators, site personnel and the ERP during an emergency, and planned measures to address and identified inadequacies of the ERP shall be undertaken.

8.2 Simulation Exercises

A simulation exercise will be designed by the Manager of Solid Waste and conducted at intervals of 12 months. The purpose of the simulation exercise is to provide an opportunity for training and reiteration and test the readiness of the site, equipment, and associated personnel in the event of an emergency situation.

Each exercise may include any or all of the following, at the discretion of the Superintendent of Public Works:

- Establishing lines of authority;
- Arranging coordination and communication;
- Mobilizing personnel and equipment;
- Deploying personnel and equipment under controlled conditions (e.g., mock injuries, contained fires);
- Contacting external agencies; and
- Evacuation.

Each exercise will be arranged and executed in conjunction with the appropriate agencies. All efforts will be made to reduce the risk to personnel, environment and property to a minimum.

Each exercise may include simulation of one of the situations covered in this ERP. No exercise needs to be duplicated within a five year period.

Appendix C

Facility Approval
(to be attached when provided)