



THE HOPE BAY PROJECT

INTERIM NON-HAZARDOUS WASTE

MANAGEMENT PLAN

December 2016

REVISION RECORD

This Interim Non-hazardous Waste Management Plan is considered a living document. As such, procedures will be reviewed periodically and re-submitted to the appropriate regulatory agencies, if appropriate. Each revision will be recorded in the table below.

Revision	Review Date	Summary of Changes	Revised By
1.0	Nov 2016	Original	TMAC

GLOSSARY AND ACRONYMS`

Term	Definition
CCME	Canadian Council of Ministers of the Environment
CWS	Canada Wide Standards
EC	Environment Canada
TMAC	TMAC Resources Inc.
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
STP	Sewage Treatment Plant
Domestic waste	All solid waste generated from the accommodations, kitchen facilities and all other site facilities, excluding those industrial and hazardous wastes associated with the mining and processing of ore.
Hazardous waste	Waste which is a dangerous good or that has been contaminated with a dangerous good that is no longer used.
Non-hazardous waste	Waste that does not exhibit any properties of hazardous waste.
Residuals	When a container contains less than 2% volume of original product.

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1. INTRODUCTION

The Non-hazardous Waste Management Plan covers information pertaining to management of non-hazardous waste generated at the Doris North Project, Boston the regional exploration leases in the Hope Bay Greenstone Belt.

Non-hazardous waste is generated by the camp, the kitchen and various on-site facilities and contracting groups. The intention of this document is to promote sustainable development, environmental protection and optimal use of resources available to TMAC Resources Inc. (TMAC).

The plan has been developed to ensure that on-site handling of non-hazardous waste conforms to all licences held by TMAC as well as industry best practices. This plan will discuss the importance of waste management and reduction of specific waste streams to assist in decreasing the amount of material that must be handled and shipped off-site for management. Management of non-hazardous waste includes recycling, treatment and disposal of waste streams based on their specific characteristics. This plan is also intended to ensure that proper documentation, tracking and handling strategies are in place to monitor compliance and take corrective actions as necessary.

Detailed information regarding the management of the incinerator and hazardous waste are available in the Hope Bay Hazardous Waste Management Plan (TMAC Sept 2012) the Incinerator Management Plan (TMAC 2016).

2. BACKGROUND INFORMATION

Due to its remote location, Hope Bay faces unique challenges regarding logistics and shipments of waste off-site for management. All materials are removed from site via aircraft throughout the year, or via barge during the short summer season.

TMAC tries to minimize the amount of non-hazardous waste shipped off-site to reduce transport and management costs. Disposing of non-hazardous waste on-site through an approved process is more cost effective for addressing certain types of non-hazardous waste produced on site.

Typical non-hazardous waste streams include:

- domestic waste (food waste, paper products, general refuse, kitchen grease, etc.)
- non-burnable wood (painted or treated) and burnable wood (2x4's scrap pieces, etc.)
- plastics (hard plastics, packaging, containers, plastic construction items, broken cones, hardhats, etc.)
- scrap metal for recycling (aluminum, tin, steel, cable, equipment parts, etc.)

3. POLICY AND OBJECTIVES

All non-hazardous waste generated on the Project site will be managed in a manner that minimizes the risk to the site workforce, the general public, and the environment.

The objective of this plan is to act as a general resource for all personnel on the project site to ensure appropriate and acceptable methods of managing non-hazardous waste. This plan will also enable the appropriate designated individuals on the site to properly and safely collect, segregate, handle, treat, store, transport, and dispose of all non-hazardous waste in an efficient manner.

The shipment of waste streams off-site must be done in accordance with strict laws and regulations. Appropriate personnel training is required to ensure that waste is transported appropriately.

This plan also provides a summary for relevant regulatory agencies and land owners who have regulatory interest over the site, its facilities and operations.

All documentation related to the management of non-hazardous wastes generated in on the Hope Bay project sites will be accurately completed and a copy retained by TMAC.

4. LEGISLATION, GUIDELINES AND APPROVAL

Waste management is regulated under the Nunavut *Public Health Act*, the Nunavut *Environmental Protection Act*, and the federal *Environmental Protection Act*. Beyond these mandatory requirements, additional information is provided in the *Environmental Guideline for the Burning and Incineration of Solid Waste* (Government of Nunavut 2012).

In addition to the legislation and guidelines above, TMAC is required to comply with the conditions of the three water licences issued by the Nunavut Water Board for the Hope Bay project area.

2AM-DOH0713 Doris North Type A Water Licence

Part G

- Item 5: The Licensee shall dispose of all food waste in an incinerator designed for this purpose.
- Item 8: The Licensee is restricted to the open burning of paper products, paperboard packing and untreated wood waste in accordance with the Government of Nunavut policy Municipal Solid Wastes Suitable for Open Burning.
- Item 10: The Licensee is authorized to dispose of and contain all non-hazardous solid wastes at the Landfill or as otherwise approved by the Board.
- Item 12: The Licensee shall back haul and dispose of all hazardous wastes generated through the course of the operation at an approved waste disposal site.
- Item 13: The Licensee shall maintain records of all waste backhauled and confirmation of proper disposal. These records shall be made available to an Inspector upon request.

Schedule D

Item 1(g): The construction monitoring report shall include monitoring of the waste management practices employed by their contractors and employees this includes food waste, hazardous waste, and non-hazardous waste.

2BB-BOS0712 Boston Type B Bulk Sample Water Licence

Part D

- Item 2: The Licensee shall not practice open burning of domestic waste, unless otherwise approved by the Board.
- Item 3: The Licensee is authorized to dispose of all acceptable food waste, paper waste and untreated wood products in an incinerator.
- Item 4: The Licensee shall provide to the Board, documented authorization from the relevant community prior to the backhauling of any waste.
- Item 5: The Licensee shall backhaul and dispose of all hazardous wastes generated through the course of the operation in an approved waste disposal site.
- Item 6: The Licensee shall maintain records of all waste backhauled and confirmation of proper disposal. These records shall be made available to an Inspector upon request.

2BE-HOP0712 Hope Bay Type B Regional Exploration Licence

Part D

- Item 2: The Licensee shall not practice open burning or on-site land filling of domestic waste, unless otherwise approved by the Board.
- Item 3: The Licensee is authorized to dispose of all acceptable food waste, paper waste and untreated wood products in an incinerator.
- Item 4: The Licensee shall provide to the Board, documented authorization from the receiving community, prior to the backhauling of any non-hazardous waste for disposal at that community.
- Item 5: The Licensee shall backhaul and dispose of all hazardous wastes, waste oil and non-combustible waste generated through the course of the operation at an approved waste disposal site.
- Item 6: The Licensee shall maintain records of all waste backhauled and confirmation of proper disposal. These records shall be made available to an Inspector upon request.

5. TRAINING

All personnel on the Hope Bay Project are responsible for reviewing and understanding the Waste Management Standard Operating Procedure (SOP). The Waste Management SOP provides a framework for properly sorting and packaging waste produced by the employee's or contractors' specific activities.

Waste Management personnel require additional training for handling and shipping hazardous wastes, incinerator operation, equipment operation, aerosol puncturing, and bulb crushing. This training includes review and sign-off of Standard Operating Procedures, Task Hazard Analyses, and/or Standard Task Procedures as each activity may dictate, accompanied by hands-on training by experienced personnel.

Records of all training must be formally documented and retained by the TMAC training department. Supervisors are responsible for ensuring that their employees have completed all the required training.

6. WASTE SEGREGATION

Waste segregation is a core component of waste management and this process will be continually refined and improved upon going forward. The best method of segregation is at the source; this is supplemented by physically sorting and categorizing waste in the waste management yard prior to backhaul in order to ensure compliance with management plans.

TMAC has created a waste sorting policy in an effort to eliminate mixed industrial waste and mixtures of industrial and domestic waste from being handled at the waste management facility. In addition, the waste sorting policy includes segregation of domestic waste to reduce the introduction of materials into the incinerator which may reduce air quality, or negatively influence incinerator efficiency.

Currently, non-hazardous wastes are sorted and segregated into the following categories:

- Plastic construction related waste;
- Burnable wood;
- Non-burnable woods (painted or treated);
- Food cans and containers;
- Cardboard;
- Cooking oil;
- Scrap steel and metal;
- Glass;
- Electrical;
- Hoses and equipment parts that are no longer in use;
- Tires;
- Oily Rags and absorbents (if contaminated with fuel, then ship as Dangerous Goods);

- Ash; and
- Oily water.

7. TRANSPORTATION FOR OFF-SITE MANAGEMENT

All non-hazardous wastes requiring transport off-site must be in appropriate containers specific to the waste stream and properly secured to ensure that no leaks or spills occur during transport.

Non-hazardous wastes are not regulated so they can be shipped via aircraft or barge using a specialized Bill of Lading.

8. MONITORING AND INSPECTIONS

Routine inspections are required to ensure compliance with this plan. The Waste Management Supervisor or designate will regularly inspect the waste collection yard, berm area, and burn pan.

Waste Management personnel will monitor and inspect all waste shipments designated for off-site management to ensure that no unsorted waste or hazardous waste is accidentally placed in the containers designated non-hazardous.

9. DOCUMENTATION

TMAC is required to maintain records of all waste backhauled as well as documentation of their management through the entire waste management process.

When non-hazardous waste is received at the Waste Management facility, a Hope Bay Waste Management Form will be completed and signed by both the individual dropping off the waste and the individual who received the waste. Additional information recorded on this form includes:

- location within each camp where the waste was generated;
- type of waste;
- volume of waste;
- special circumstances, if any; and
- additional supplies requested (mega bags, empty drums, etc.), if any.

This ensures that individuals dropping off waste have packaged and labeled it appropriately. Additionally, if issues arise with delivered waste, documentation and contact information are available to allow for parties to be educated on proper waste handling and sorting.

To provide a baseline for waste reduction initiatives, it is important to understand the type and volume of wastes being received and backhauled. All waste that is backhauled off-site for management shall be documented and each container assigned a unique identifier which shall be used for tracking and documentation purposes.

In addition to the Waste Management Receiving Form, all waste received at waste management is logged into an all-inclusive backhaul tracking template. This template is managed by Waste Management and is used to prepare loads requiring shipment off-site. This tracking form is a necessity for all waste requiring disposal off-site whether it has hazardous or non-hazardous properties.

All non-hazardous waste requiring shipment off-site must have a Bill of Lading accompany the shipment. As this waste has no hazardous properties, it does not require a Dangerous Goods Manifest or a Movement document. The Bill of Lading is filled out by Waste Management and forwarded to the flight logistics group when there is availability for a backhaul.

10. ROLES AND RESPONSIBILITIES

This management plan is the responsibility of all TMAC personnel; however, it is the Waste Management personnel's responsibility to oversee the day-to-day management of the waste streams produced on-site, and ensure that all applicable transport regulations are followed. Accurate records must be maintained and available for audit by TMAC Management. These records will be reported in the Water Licence Annual Report.

The Facilities Management is responsible for ensuring that the waste management facilities have the appropriate equipment and resources available to properly manage the site waste.

11. TYPES OF WASTE

11.1. KITCHEN AND DOMESTIC WASTE

All kitchen waste is incinerated to prevent attraction of wildlife. Waste segregation bins are stationed around camp for segregation of aluminum, glass, plastic, hazardous wastes (sharps, batteries, aerosols), bottles, and cans. Items that are not appropriate for incineration, due to reduction in burn efficiency or air quality issues, are packaged for off-site disposal. Kitchen grease is also separated into 205 L clean drums for off-site disposal.

11.2. SEWAGE SLUDGE

Sewage sludge is currently collected and incinerated at the Roberts Bay incinerator. Processed sewage filter cake from the Sewage Treatment Plant (STP) is double bagged in approximately 30 lb packages and delivered to waste management for incineration. . All sewage solids must be stored separately and segregated from any food wastes for compliance of the TMAC licence.

11.3. CLEAN WOOD AND CARDBOARD

Clean wood, paperboard and paper are permitted to be burned in the burn pan located adjacent to Quarry 2. Fires will only be initiated by the Waste Management personnel.

11.4. INCINERATOR AND BURN PAN ASH

Incinerator and burn pan ash is currently packaged in drums for shipment and disposal off-site. TMAC is interested in managing the quality of the ash and may consider using clean, non-hazardous ash in reclamation activities or in the landfarm. TMAC, in addition to ongoing improvement to waste separation, will undertake regular testing necessary to determine if this material is appropriate for remedial use.

Details regarding the operation and management of the incinerator are available in the Incinerator Management Plan (HTMAC April 2014).

11.5. NON-BURNABLE WASTES

According to the Nunavut Municipal Solid Wastes Suitable for Open Burning, “Municipal solid wastes that are conditionally suitable for open burning are paper products, paperboard packing and untreated wood wastes only.” It further states that “Building demolition wastes should not be burned unless they have been sorted to remove non-wood waste such as roofing materials, electrical wire, plastics, asbestos and other non-wood wastes.”

As such, the following non-hazardous materials are not suitable for open burning and will be diverted to the waste management area for backhaul and off-site management:

- Painted or treated wood,
- Drywall or ceiling tiles;
- Insulation;
- Plumbing waste;
- Welding rods;
- Flooring;
- Scrap metal;
- Electrical waste;
- Mechanical/equipment waste; and
- Filters (air, furnace, oil).

12. BOSTON CAMP & WINDY CAMP WASTE

All non-hazardous wastes collected at the Boston facility will be transported to and managed through the Doris North Project waste management facility. Non-hazardous wastes may be transported by aircraft between Boston and Doris or via the winter access road; volumes of waste from Boston will be tracked separately in all documentation.

Non-hazardous wastes collected during clean-up and reclamation activities at Windy Camp and Patch Laydown will also be handled at the Doris North Project waste management facility. The volumes of waste handled from Windy and Patch will be transported by road, and documented separately.

All wastes from each of these locations will be properly segregated, packaged, secured, and labeled prior to shipment.

REFERENCES

EBA. 2010. *Quarry A Landfill Management Plan*.

Government of Nunavut. 2012. *Environmental Guideline for the Burning and Incineration of Solid Waste*.

TMAC. 2014. *Incinerator Management Plan*. Prepared by TMAC Resources.

TMAC. 2016. *Hope Bay Project Hazardous Waste Management Plan*. Prepared by TMAC Inc.