APPENDIX B13 - INCINERATOR WASTE MANAGEMENT PLAN, VERSION 5 (JULY 2014)

MEADOWBANK GOLD PROJECT

Incinerator Waste Management Plan

In Accordance with Water License 2AM-MEA0815

Prepared by:
Agnico Eagle Mines Limited – Meadowbank Division

Version 5
July 2014

EXECUTIVE SUMMARY

This Incinerator Waste Management Plan (IWMP) describes the performance limits, waste management protocols, operation, monitoring and record keeping requirements for the incinerator, as part of the Agnico Eagle Mines Limited (AEM) Meadowbank Gold Project in Nunavut. This plan was developed in support of AEM's application for a Type A Water License from the Nunavut Water Board (NWB). This updated IWMP is a component of the Meadowbank Environmental Management System. The IWMP will be reviewed regularly by AEM and updated as needed. Any changes in operation/procedures are communicated to all applicable Meadowbank Departments.

The main objective of waste management relating to the primary incinerator and waste oil furnaces is to minimize the amount of waste to be incinerated by implementing an effective waste segregation and reuse (in the case of waste oil) program to ensure that only appropriate types of waste are incinerated. The primary objective of incineration is to eliminate materials from the landfill that could create odours, attracting wildlife to the landfill site or to the Meadowbank camp; as well as to avoid the generation of leachate caused by the decomposition of putrescible materials. The primary incinerator is a dual chamber, high- temperature incinerator and is used to dispose of solid waste from the accommodation camp, kitchen, shops, and offices that cannot be landfilled. The materials to be incinerated will be limited to putrescible waste such as paper, wood, food packaging and food waste. In addition, a series of small waste oil burning furnaces will be used for the disposal of used petroleum products such as heavy lubricants and engine oil. Ash produced from the incineration process will be disposed of in the on-site landfills. A protocol is implemented for testing incinerator ash and contingent measures for alternate disposal of ash if quality is unsuitable for landfilling.

AEM has purchased an incinerator from Eco Waste Solutions that complies with applicable regulations. The incinerator is designed to achieve compliance immediately upon attaining normal full scale operation. In addition to the incinerator technology, the implementation of a waste management and segregation plan will limit emissions of dioxins and furans from the incinerator. Compliance to the performance limits was confirmed by periodic stack testing annual initially and as the results meet the Canadian Council of Ministers of the Environment (CCME) Canada-wide Standards for Dioxin and Furans (CCME, 2000a) and the CCME Canada-wide Standards for Mercury Emissions (CCME, 2000b), biennial testing is done as long as our waste stream has not changed.

In order to demonstrate compliance with performance limits, an annual incineration management report will be prepared and submitted to the NWB (as part of the water license annual report), Government of Nunavut (GN), Environment Canada (EC), and NIRB. The quantity of materials incinerated on site during operations, together with results from stack emission and ash monitoring, will be included within the annual report.

This IWMP will be maintained by AEM to reflect the current operations at the Meadowbank Gold Project, permit requirements and regulatory setting. The IWMP will be reviewed on a regular basis and revised when necessary to ensure that the project staff, operators and regulatory bodies are kept aware of any changes to project operations.

IMPLEMENTATION SCHEDULE

As required by Water License 2AM-MEA0815, Part B, Item 16, the proposed implementation schedule for this Plan is outlined below.

This Plan will be immediately implemented (July 2014) subject to any modifications proposed by the NWB as a result of the review and approval process. This document will supersede the Incinerator Waste Management Plan Version 4 – 2012.

DISTRIBUTION LIST

AEM – General Mine Manager

AEM – Environment Superintendent

AEM – Environmental Coordinator

AEM – Environmental Technician

AEM – Site Services Superintendent

AEM – Field Services Supervisor

AEM – Incinerator Operator

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	08/10/08	3 & 6	5 & 13	Revised to consider best management practices for ash
		App 1		Technical specifications for primary incinerator included
2	09/05/12	1; 3.3; 4.1	1; 7; 8	Revised to include regulatory comments
3	12/11/16			2012 Comprehensive Review
4	12/11/16	ES; 3.1, 6.1	II, 5, 13	Stack testing will be completed biennially
		5.5	12	Adjusted quantities for mass reduction
		APP III		Include Procedure for Loading Incinerator
5	14/07/21	All	All	2014 Comprehensive Review

Prepared by: Environmental Department

Approved by: 

Ryan Vanengen
Environmental Superintendent - Interim

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SECTION 1. INTRODUCTION

1.1 PROJECT OVERVIEW

This Incinerator Waste Management Plan (IWMP) describes the performance limits, waste management plans, operation, monitoring and record keeping requirements for the primary incinerator as part of the Meadowbank Gold Project operated by Agnico Eagle Mines Limited Meadowbank Division.

This update to the initial IWMP is a component of the Meadowbank Environmental Management System. The objectives of this Plan are summarized as follows:

1. To define the location, design and operating procedures to be used in the incineration of appropriate non-hazardous solid waste generated at the Meadowbank Mine;
2. To define acceptable/non-acceptable types of solid waste to be placed in the Meadowbank incinerator; and
3. To define operating and monitoring requirements for the incinerator and waste oil burning furnaces.

The original IWMP was submitted to the Nunavut Water Board in August of 2007 as a component of the Type A Water License application for the Meadowbank Project. Part F - Item 10 of this water license requires the following update of the August 2007 IWMP:

> *The Licensee shall submit to the Board for approval, within three (3) months of License approval, a revised Incineration Management Plan. The Plan shall consider best management practices for ash disposal.*

An IWMP is also required to fulfill Nunavut Impact Review Board (NIRB) Project Certificate commitment number 70 which states *'prepare and implement an incinerator waste management plan'* (Letter from NIRB to Cumberland dated December 30, 2006). AEM will be responsible for managing and implementing this IWMP. Implementation of the IWMP will be the responsibility of the Meadowbank Site Services Superintendent.

The primary incinerator is required for environmental and pest control. The incinerator will dispose of solid waste from the accommodation camp, kitchen, shops, and offices that cannot be landfilled at the Meadowbank Gold Project Site. The incineration of waste will divert waste, which could create odours and potentially attract wildlife, from the proposed on-site landfill. The materials to be incinerated will be limited to putrescible waste such as paper, food packaging and food waste. A series of small waste oil burning furnaces, to provide space heating, will be used for the disposal of used petroleum products such as heavy lubricants and engine oil. The waste oil burning furnaces have been included within this IWMP.

Ash produced from the incineration process is disposed of within the on-site landfills according to the Environmental Guideline for Industrial Waste Discharges (D of SD, 2002). The incinerator burn ash will be tested to confirm its suitability for landfill disposal (Section 3.3 and 6.3). If monitoring indicates the ash is not suitable for landfilling, it will be buried within the Tailings Storage Facility (TSF). Materials buried within the TSF are expected to freeze over a period of time, resulting in permafrost encapsulation (MMC, 2007a,

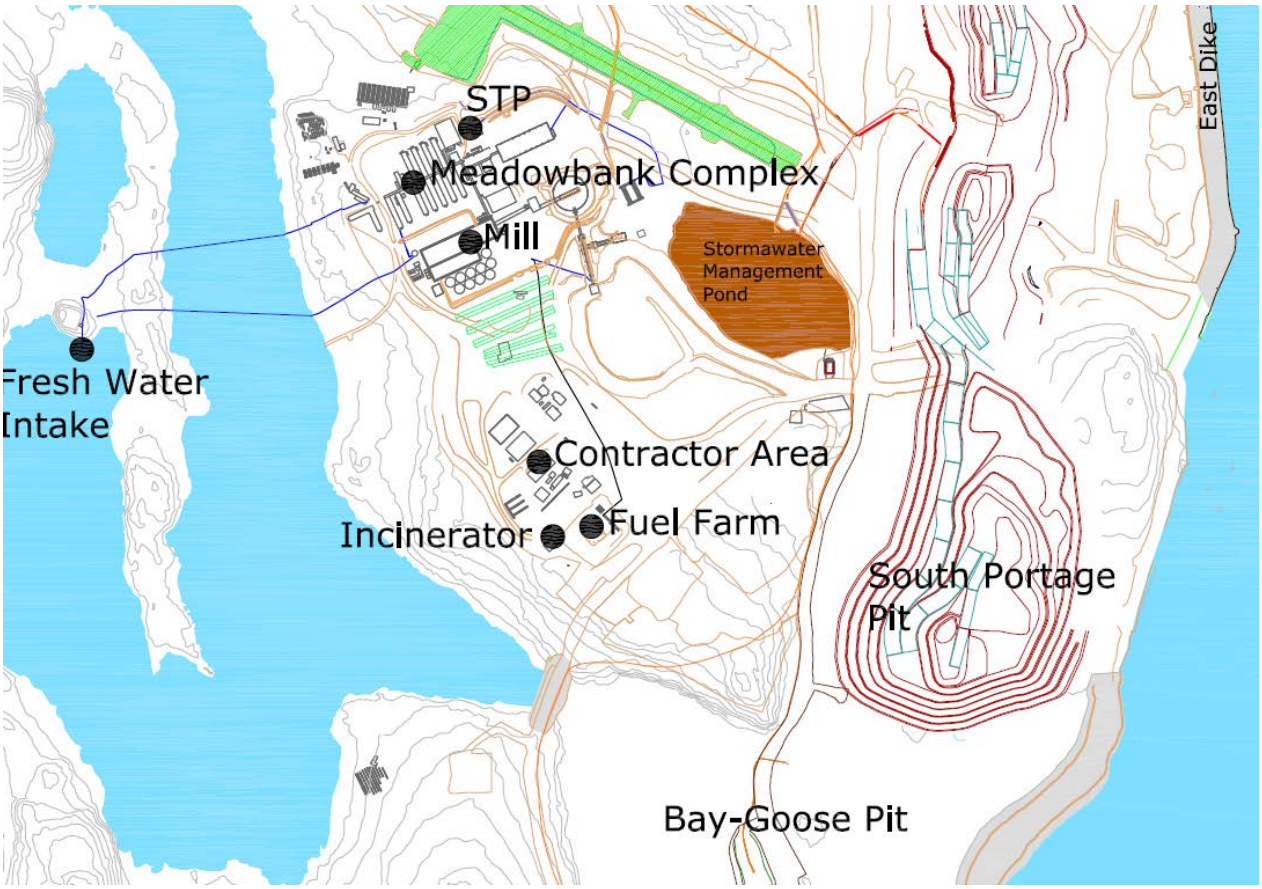
Doc. No. 485).

The camp is currently accommodating ~520 persons on any given day during operations, and the expected life of operation of the incinerator is 10-15 years.

1.2 INCINERATOR LOCATION

The primary incinerator is located away from the plant site and accommodations complex, adjacent to the fuel storage facility. A series of small dedicated waste oil burners were installed in the existing blue coverall, cat dome and site services coverall to provide space heating (see Figure 1-1).

Figure 1-1 Incinerator Location



SECTION 2. REGULATORY CONTEXT

The following section outlines the regulatory setting relating to solid waste incinerators and waste oil burners, and discusses how the regulations apply to the incinerator and waste oil burners at the Meadowbank site.

Provincial and/or territorial regulations that pertain to emissions from incinerators were not found for Nunavut or the Northwest Territories. Therefore, performance limits for the incinerator at Meadowbank will be in accordance with the emission regulations set out by the Canadian Council of Ministers of the Environment (CCME) Canada-wide Standards for Dioxin and Furans (CCME, 2000a) and the CCME Canada-wide Standards for Mercury Emissions (CCME, 2000b).

The management of used oil is regulated in the Northwest Territories according to the Used Oil and Waste Fuel Management Regulations, N.W.T. Reg. 064-2003 (NWT, 2003). In the absence of Nunavut guidance/regulations pertaining to used oil, these regulations will be adopted for the Meadowbank site.

Ash produced from the incineration and waste oil burning process will be disposed of according to the Nunavut Environmental Guideline for Industrial Waste Discharges (D of SD, 2002).

2.1 BACKGROUND INFORMATION

2.1.1 Dioxins and Furans

Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), commonly known as dioxins and furans, are toxic, persistent, bioaccumulative, and result predominantly from human activity. Due to the extraordinary environmental persistence and capacity to accumulate in biological tissues, dioxins and furans are slated for virtual elimination under the CEPA, the federal Toxic Substances Management Policy (TSMP) and the CCME Policy for the Management of Toxic Substances (CCME, 2000a).

2.1.2 Mercury

Mercury is a naturally occurring substance, which is transformed through biological processes to methyl mercury, a persistent substance which bioaccumulates in the food chain and is particularly toxic to humans and wildlife. Mercury levels originate from a combination of naturally-occurring mercury and anthropogenically emitted mercury. Under a variety of regional, national, bi-national and internal programs, treaties and agreements, mercury is being targeted for emissions reductions consistent with the CCME Policy for the Management of Toxic Substances, which identifies that mercury shall be managed through its lifecycle to minimize release (CCME, 2000b).

2.1.3 Used Oil and Waste Fuel

According to the Used Oil and Waste Fuel Management Regulations (NWT, 2003) ‘used oil’ means any oil, including lubrication oil, hydraulic fluids, metal working fluid and insulating fluid, that is unsuitable for its intended purpose due to the presence of impurities or the loss of original properties, but does not include waste oil derived from animal or vegetable fat, a petroleum product spilled on land or water, or waste from

a petroleum refining operation. 'Waste fuel' means a flammable or combustible petroleum hydrocarbon, with or without additives, that is unsuitable for its intended purpose due to the presence of contaminants or the loss of original properties, and includes gasoline, diesel fuel, aviation fuel, kerosene, naphtha and fuel oil, but does not include paint, solvent or propane.

SECTION 3. PERFORMANCE LIMITS

3.1 PRIMARY INCINERATOR

AEM has selected a Camp Waste Incinerator (model no, ECO 1.75TN 1P MS 60L) from Eco Waste Solutions, which is designed to comply with the regulations in Table 3-1, where the maximum emissions are expressed as a concentration in the exhaust gas exiting the stack of the facility. The specifications of the incinerator are available in Appendix I. In addition to incinerator technology, the implementation of the waste management plan is designed to limit emissions of dioxins and furans from the incinerator.

Table 3-1 Emission Standards for Solid Waste Incinerators

Emissions	Sector	Units	Guideline Maximum	Reference guideline
Dioxins and Furans	Municipal Waste	pg I-TEQ/m^3	80	CCME, CWS 2000a
Dioxins and Furans	Sewage Sludge Incineration	pg I-TEQ/m^3	80	CCME, CWS, 2000a
Mercury	Municipal Waste	µg/R m^3	20	CCME, CWS, 2000b
Mercury	Sewage Sludge Incineration	µg/R m^3	70	CCME, CWS, 2000b

Notes Stack concentrations are corrected for 11% oxygen

At Meadowbank, the primary incinerator may be subject to either Municipal or Sewage Sludge standards based upon the total amount of waste type incinerated (>50% as one type) or upon the territorial designation of facility type. According to the Canada Wide Standards “municipal solid waste’ includes any waste that might be disposed of in a non-secure landfill site if not incinerated (i.e., non-hazardous wastes regardless of origin), but does not include “clean” wood waste.

The incinerator at Meadowbank is expected to achieve compliance immediately upon attaining normal full scale operation. Compliance to these performance limits will be confirmed by stack testing performed by an external contractor biennially.

3.2 USED OIL

AEM manages used oil and waste fuel according to the Used Oil and Waste Fuel Management Regulations, NWT Reg. 064-2003, 2003.

Table 3-2 summarizes some main points of the regulations that pertain to waste oil generated on site, as per the Waste Oil and Waste Fuel Management Regulations (NWT, 2003).

Table 3-2: Summary of Used Oil and Waste Fuel Regulations

As per 'Used Oil and Waste Fuel Management Regulations'	
Disposal	Waste oil/Waste fuel will not be disposed of directly into the environment
Storage	Waste oil/Waste fuel is stored in specifically designed container for hydrocarbons, minimizing the risk of spills Waste oil/waste fuel containers are periodically inspected for leaks or potential leaks Waste oil/Waste fuel will be stored as per the *Hazardous Materials Management Plan* (Version 3, October 2013)
Sampling and Analysis	A sample of one month's feedstock of waste oil/waste fuel is required to be tested at least once a year Waste oil will be tested for: ***Flash point*** ***Existence and amount of each impurity Listed in Table 3-3***
Burning	Waste Oil/Waste Fuel will not be burned openly Waste oil will not be burned in residential areas Waste Oil with a flash point of <37.7 degrees Celsius (^{0}C) with not be burned or blended with other waste oil/waste fuels Waste Oil that exceeds guidelines will not be burned
	14 days' notice will be given for the burning of waste fuel
Records	The following is recorded in association with the incineration of used oil: ***Volume of Used oil generated*** ***Volume of used oil incinerated/consumed*** ***Name and Address of person in charge, management or control of the used oil*** ***A summary of maintenance performed on incinerator or processing equipment*** ***The destination of the used oil products shipped from the facility***

Table 3-3 summarizes the maximum level of contaminants in used oil that can be incinerated or consumed by the waste oil burning furnaces as stipulated within the NWT Used Oil and Waste Fuel Management Regulations (NWT, 2003). Under the regulations blending of used oil that exceeds one of more of the criteria listed in Table 3-3 is not allowed.

Table 3-3: Used Oil Impurity Limit

Impurity	Units	Maximum Level Allowed in Used Oil
Cadmium	ppm	2
Chromium	ppm	10
Lead	ppm	100
Total Organic Halogens (as chlorine)	ppm	1000
Polychlorinated biphenyls	ppm	2

3.3 INCINERATOR ASH

Ash resulting from the incineration of solid waste is disposed of in the landfill and tested for metals according to the Environmental Guideline for Industrial Waste Discharges (D of SD, 2002). Ash that does not meet these guidelines will be buried within the Tailings Storage Facility (TSF). Table 3-4 summarizes the guidelines for metals parameters based on leachate test results.

Table 3-4: Guidelines for Solid Waste/Process Residuals Suitable For Landfill

Parameter	Concentration maximum (mg/L)
Arsenic	2.5
Barium	100
Cadmium	0.5
Chromium	0.5
Lead	5
Mercury	0.1
Selenium	1
Silver	5
Zinc	500

NOTE: Standards based on leachate test results

SECTION 4. INCINERATOR OPERATION

4.1 PRIMARY INCINERATION

A typical modern controlled-air batch (dual chamber) incinerator (as purchased for installation at Meadowbank) is based on the principals of pyrolysis (starved-air burning condition) and complete oxidation (high temperature, excess oxygen and sufficient time). The incineration system is a two-stage process. In the first stage, waste is converted to gas in the primary chamber at approximately 650 to 850 ^{o}C. At this temperature any potentially infectious material is destroyed. This process is self-fueling until the volume is reduced by 90%. Gasses from the primary chamber enter the secondary chamber of oxygen rich and turbulent conditions, which is typically at a higher temperature – around 1000 ^{o}C. Combustion is complete after a minimum retention time. A used oil burner is used in the secondary chamber to reduce the quantity of fuel needed for the operation of the incinerator.

Critical process parameters and process control data as per the incinerator operation specifications such as temperature, combustion air flow and burner output are computer controlled to maintain optimal combustion conditions. These records are kept for at least 2 years.

For an incinerator capacity suitable for the predicted volumes of waste to be generated at the Meadowbank site the total particulate matter (PM) generated is extremely low. Therefore dust collection technologies such as bag house filters are not being employed, and no fly ash is generated. Ash residual from the incinerator is generated and is removed daily as required by manual removal using a shovel emptied into a metal bin.

4.1.1 Emissions

The Eco Waste Solutions Incinerator used by AEM is designed to meet performance limits described in Section 3.1. The Primary incinerator has been designed by Eco Waste Solutions using good engineering practice to ensure required dispersion of gases to meet applicable air quality standards/objectives.

The incinerator stack design incorporates appropriate sampling ports (with caps where necessary) at appropriate locations to allow for stack testing to be undertaken during incinerator operation.

4.1.2 Dust/Odour Control Measures

Modern incinerators are commonly designed such that the non-turbulent atmosphere in the primary burn chamber reduces the formation of particulate matter. Therefore, the need for additional dust and /or odour control measures is not required.

4.1.3 Staffing and Equipment

The computerized incinerator requires one to operate with the equipment for approximately 1 to 1.5 hours per day (for ash removal, loading and start-up). Operators are not required to be in attendance during the rest of the operation, as it is a fully automated process. This incinerator is designed so that the operators are not exposed to high temperatures during loading or ash removal due to complete cool down after the burn cycle. Also, the waste is not allowed to combust until the chamber is sealed thus isolating the worker

from smoke and high temperatures. The operating procedure for the incinerator loading can be found in Appendix II.

4.1.4 Operator Training

Operator training was initially provided by a suitably experienced technician from the incinerator supplier/manufacturer (Eco Waste Solutions). Training for operation of the incinerator is now given by the supervisor in charge of the incinerator, who was originally trained by Eco Waste Solutions.

4.2 USED OIL FURNACE

Used oil is used as auxiliary fuel at the secondary chamber at the incinerator. This used oil burner at the incinerator has the capacity to handle approximately 200,000 liters of used oil per year. This used oil burner will reduce the amount of fuel used in the incinerator.

Dedicated waste oil burners were installed in the existing blue coverall, cat dome and site services coverall to provide space heating. These waste oil burners have an aggregate capacity to handle approximately 60,000 liters of waste oil per year, however more may be put in service to expand our waste reduction program and minimize the shipment of this material south each year. The source of the waste oil will be from oil changes on the mining equipment and light vehicles as well as oil changes to mechanical gearboxes within the mill. Used oil furnaces include a storage tank and a filter to recover sludge prior to burning. Sludge collected in the waste oil filter is drummed and shipped south, yearly, to a licensed disposal /recycling facility for treatment.

4.3 CLOSURE PLAN

In accordance with the Preliminary Closure and Reclamation Plan (MMC, 2007b, Doc. No. 511), salvageable buildings and surface structures, including the primary incinerator and used oil furnace, will be dismantled and demobilized from the site. No structural material will be incinerated during the closure phase of the mine.

SECTION 5. WASTE MANAGEMENT

The amount of waste will be reduced through purchasing policies that focus on reduced packaging and on-site diversion and segregation programs. At Meadowbank the main objective of the waste management plan relating to incineration and the waste oil burning furnaces is to minimize the amount of solid waste to be incinerated by following an effective waste segregation and reduction program to ensure that only appropriate types of waste are incinerated.

Figure 2 provides a schematic diagram for the management of solid waste and used oil produced on site.

5.1 APPROACH

A waste segregation and reduction program is implemented at the site (i.e. the separation of non-food waste items suitable for storage and subsequent transport and disposal or recycling). This will allow materials that are unsuitable for incineration to be either landfilled on site or hauled offsite to a licensed disposal facility. The waste segregation program will also document the quantities and types of materials that are incinerated. In addition AEM are now incorporating a waste reduction strategy for materials that originally were being incinerated. For example styrofoam coffee cups and plastic lids were eliminated from general site use in 2012 and replaced with stainless steel mugs and re-washable plastic cups. Other materials will be considered during the life of mine for elimination from the incinerator waste stream.

5.2 ACCEPTABLE WASTE FOR INCINERATION

Acceptable wastes for incineration, in the primary incinerator as per the operational instructions, include the following:

- Organic matter including food;
- Food containers and wrappings including plastics that are contaminated by food;
- Paper and cardboard; and
- Dead animals (small size only).

Acceptable wastes for incineration in the used oil furnaces include the following:

- Waste oils; and
- Flammable or combustible petroleum hydrocarbons unsuitable for its purpose due to the presence or contaminants or loss of original properties (such as gasoline, diesel fuel, aviation fuel, kerosene, naptha or fuel oil).

5.3 UNACCEPTABLE WASTE FOR INCINERATION

Materials that are not listed above are unacceptable for incineration. These materials include, but are not limited to:

- Uncontaminated plastics, including chlorinated plastics;
- Inert materials such as concrete, bricks, ceramics, ash;
- Bulky materials such as machinery parts or large metal goods such as appliances;
- Radioactive materials such as smoke detectors;
- Potentially explosive materials such as propane tanks, other pressurized vessels, unused or ineffective explosives;
- Other hazardous materials such as organic chemicals (PCBs, pesticides), other toxics (arsenic, cyanide);
- Electronics;
- Batteries;
- Asbestos;
- Dry wall;
- Vehicles and machinery;
- Fluorescent light bulbs;
- Whole tires; and
- Any materials containing mercury.

Unacceptable wastes for incineration in the used oil furnace include the following:

- Used oil that exceeds the Maximum Impurity Limits for parameters listed in Table 3.3;
- Waste oil with a flash point of less than 37.7 deg C;
- Paint;
- Solvents; and
- Propane.

5.4 WASTE VOLUMES

5.4.1 Solid Waste

The quantity of waste being incinerated is averaging 1750 kg per day during operations with a camp size of ~520 persons during operations.

5.4.2 Used Oil

The quantity of used oil generated from the servicing of machinery and generators is estimated at approximately 463,000 liters per year (Meadowbank Gold Project – 2013 Annual report).

5.4.3 Incineration Ash

The quantity of ash from the incinerator is approximately 240 tonnes/year, assuming that the incineration process results in a 63% reduction in mass. Assuming the ash has a total density of 1.2 tonnes / m^3, then a volume of approximately 200 m^3 /yr of ash will require disposal. Incinerator ash will be located in the Landfill in the Waste Rock Storage Facility. When the ash is placed in the landfill it will immediately have waste that is in landfill placed on top of the ash to disallow the material to be windblown.

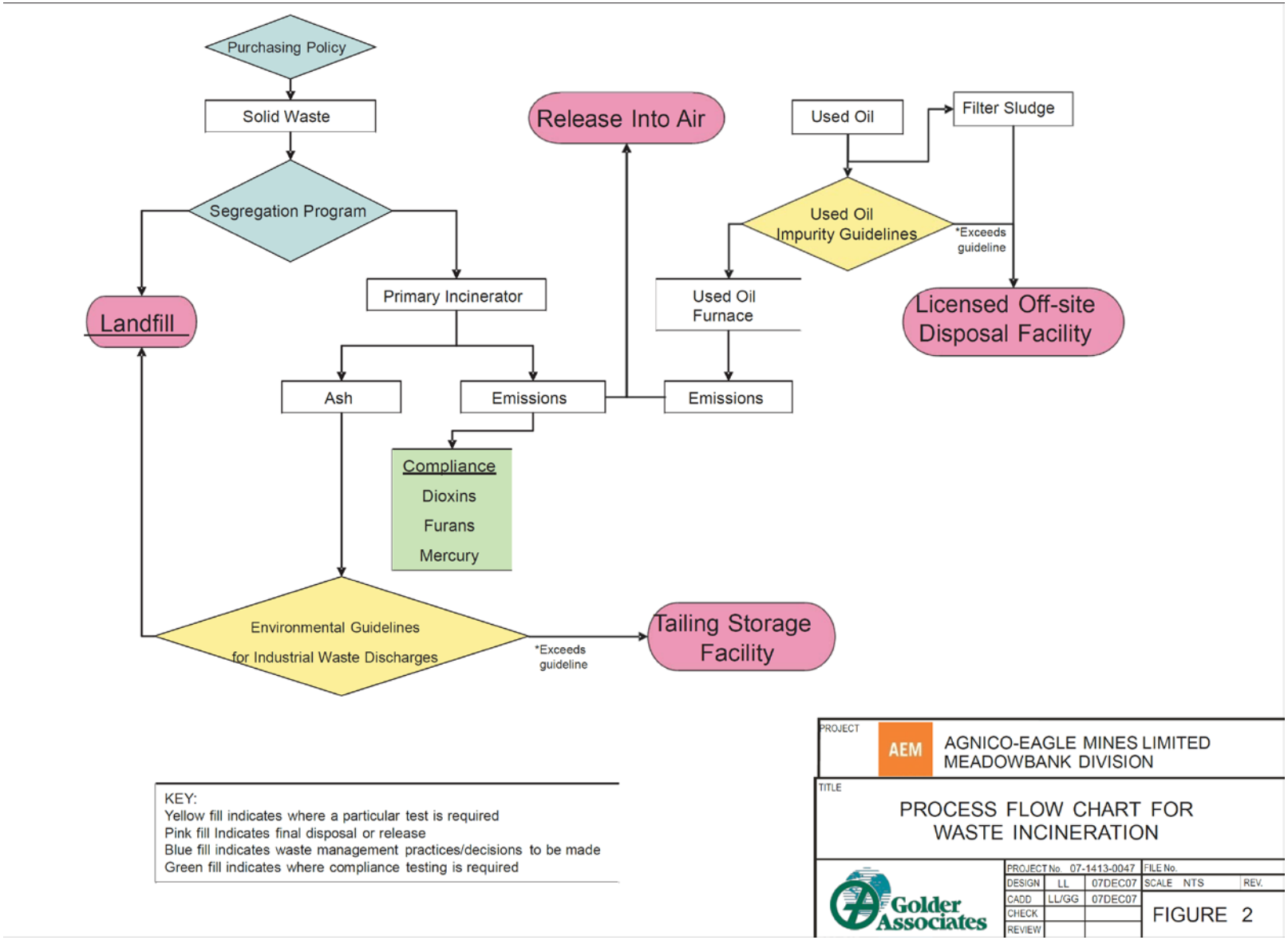
5.5 WASTE INCINERATION RATE

The incinerator has an approximate incineration capacity of 1750 kg / h based on a 10 hour burn cycle. If this cannot be achieved the primary chamber can be used as storage. According to the Eco Waste Solution, the type of waste that is used will never exceed the weight limit. To ensure maximum efficiency, 3 quarters of the chamber has to be filled to ensure that the gas outlet of the primary chamber is never blocked.

The system has a sizable front door for easy access to manually load feed waste into the unit with a front end loader. Dry waste (paper, cardboard) and wet waste (organic matter including food) will be layered to ensure proper combustion and maximum efficiency according to the incinerator operational instructions.

The batch cycle for the Primary Chamber typically lasts approximately 8 hours for the burn cycle and is followed by a cool down of approximately 10 hours. The Secondary Chamber operates with a retention time of approximately 2 seconds.

Figure 5-1: Process Flow Chart for Waste Incineration



SECTION 6. MONITORING AND TESTING

The following presents the monitoring and testing plan for the incinerator.

6.1 INCINERATOR EMISSIONS TESTING

The incinerator stack design incorporates appropriate sampling ports at appropriate locations, in right angle configuration, to allow for stack testing to be undertaken during incinerator operation. Table 6-1 summarizes the frequency of testing that is completed.

Table 6-1: Summary of Incinerator Emissions Testing

	Frequency	Number of Test Required	Relevant Guideline
Furans and Dioxins	Biennial	3	CCME, CWS 2000a
Mercury	Biennial	3	CCME, CWS 2000b

6.2 WASTE OIL TESTING

A sample of one month's feedstock of waste oil is tested each month. Waste oil that does not meet the regulation impurity limits is drummed and shipped off site each summer to a re-refining facility or licensed disposal facility.

6.3 ASH TESTING

Ash samples were collected from the incinerator on July 1, August 22, and September 21 of 2009; October 5, 2010; February 23, 2011 and September 13, 2011; and February 14, 2012 in accordance with AEM's previous 'Incinerator Waste Management Plan' (AEM, May 2009, v2). The purpose of sampling ash is to determine its acceptability for disposal in the landfill, pursuant to the Government of Nunavut (GN) Environmental Guidelines for Industrial Discharge (2002). The samples met all of the GN discharge guidelines and therefore demonstrate the incinerator ash is acceptable for disposal in the Meadowbank landfill.

Ash samples are collected and tested annually, or upon a significant change in the source or type of material sent to the incinerator. If monitoring indicates the ash is above the guidelines and not suitable for landfilling, an investigation will be undertaken to identify the cause and eliminate the source for this exceedance. Ash with elevated metals concentrations will be buried within the Tailings Storage Facility (TSF); materials buried within the TSF are expected to freeze over a period of time, resulting in permafrost encapsulation (MMC, 2007a, Doc. No. 485). If deemed necessary, the ash will be packaged in drums and sent to a licensed hazardous waste disposal facility in the south.

SECTION 7. MAINTENANCE

Annual maintenance of the incinerator is scheduled. This maintenance is preformed to evaluate the insulation and structural integrality of the incinerator. This is done to be sure the incinerator is functioning at its optimal standard.

When this maintenance is being performed 4 small single chambered incinerators will be used to incinerate the waste that would normally be disposed in the Eco Waste main unit, to prevent a back log of putrescible waste which would attract wildlife.

SECTION 8. REPORTING

In order to demonstrate compliance with performance limits, an annual incineration management report will be submitted as an Appendix in the Meadowbank Gold Projects Annual Report to the NWB, Government of Nunavut (GN), Environment Canada (EC), and NIRB. The quantity and type of materials incinerated on site during operations, together with results from periodic stack emission and ash monitoring, are to be included within the annual report.

8.1 NATIONAL POLLUTANT RELEASE INVENTORY

The NPRI is a Canadian database containing information on the annual on-site release of specific substances to the air, water and land from industrial and institutional sources (EC, 2007). The NPRI provides a list of tracked substances and requirements for reporting incinerator emissions. Table 8-1 lists the substances under the NPRI that Meadowbank is required to report annually. In addition, there are certain substances as indicated in Table 8-1 that may require reporting depending on the quantity of incinerator emissions. Whether or not reporting is necessary will depend on results of the periodic stack emission testing data and the quantity of annual emissions calculated with emission factors.

Table 8-1: NPRI Incineration Reportable Substance List

Substance Name	Notes
Hexachlorobenzene	Required to Report
Dioxins and Furans	
Carbon Monoxide	Required to Report if released to air from facility in a quantity of 20 tonnes or more per annum
Oxides of nitrogen	
Sulphur dioxide	
Total Particulate matter with diameter <100 microns	
Particulate matter with diameter less than or equal to 10 microns (PM10)	Required to Report if released to air from facility in a quantity of 0.5 tonnes or more per annum
Particulate matter with diameter less than or equal to 2.5 microns (PM2.5)	Required to Report if released to air from facility in a quantity of 0.3 tonnes or more per annum

8.2 GREENHOUSE GAS EMISSIONS

AEM is committed to reporting greenhouse gas emissions (GHG) in support of Canada's Voluntary Challenge Registry; currently termed the Canadian GHG Challenge Registry. AEM have developed a

baseline and monitoring system for GHG to evaluate and report on progress in improving efficiency and reductions in GHG.

SECTION 9. PLAN REVIEW AND CONTINUAL IMPROVEMENT

This Incinerator Waste Management Plan will be maintained by AEM to reflect the current operations at the Meadowbank Gold Project, permit requirements and regulatory setting. The Plan will be reviewed on a regular basis and revised when necessary to ensure that the project staff, operators and regulatory bodies are kept aware of any changes to operational procedures.

The up to date Incinerator Waste Management Plan will be made available at all times by AEM for review by the NWB, Government of Nunavut, and Environment Canada.

SECTION 10. REFERENCES

CEPA, 1999. Canadian Environmental Protection Act. March 31, 1999

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Meadowbank Mining Corporation (MMC), 2007a. Type A Water License Application. Doc. No. 485, dated August 2007.

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Meadowbank Mining Corporation (MMC), 2007c. Meadowbank Gold Project Hazardous Materials Management Plan. Doc. No. 457, dated August 2007.

Meadowbank Mining Corporation (MMC), 2007d. Meadowbank Gold Project Water Quality and Flow Monitoring Plan. Doc. No. 450, dated August 2007.

National Guidelines for Hazardous Waste Incineration Facilities - Design and Operating Criteria, Volume 1, March 1992, (CCME).

NWT, 2003. Used Oil and waste fuel management regulations, 2004, NWT Reg 064-2003. January 1, 2003.

APPENDIX I

TECHNICAL SPECIFICATIONS:
ECO WASTE SOLUTIONS INCINERATOR MODEL NO. ECO 1.75TN 1P MS 60L

TECHNICAL DATA SHEET

Technical Data

Supply all technical data for each item applicable, in the format shown on the following pages. Include drawings necessary for a technical evaluation of each item.

Equipment Number	TBD
Equipment Description	Camp Waste Incinerator
Manufacturer	Eco Waste Solutions
Model Number	ECO 1.75TN 1P MS 60L
Total Installed Weight, kg	44,500 kg (estimated with building)
1 Waste Incinerator	
Waste classification: (TYPES)	1. Camp Waste
	2. Sewage Sludge
	3. Waste Oil
Mixed waste charge classification: Break-down of each type of waste (%)	1. Camp Waste - 75%
	2. Sewage Sludge - 25%
	3. Waste Oil - N/A charged into secondary
****Emissions:**	
SO_2 (mg/m^3)	50 mg/m^3
CO (mg/m^3)	7 mg/m^3
NOx (ppm)	< 50 ppm
VOCs $\mu g/m^3$	50 - 2000 $\mu g/m^3$
Particulate (mg/m^3)	20 mg/m^3
PM_{10} (g/s)	N/A
Dioxins/Furan (pg I-TEQ/m^3)	< 80
Mercury ($\mu g/Rm^3$)	N/A - Materials cotaining Mercury to be excluded from incinerator waste stream
Flue Gas Temperature (°C)	1000°C
Flue Gas Flow Rate (kg/s)	1.996 kg/s (max)
Incineration capacity: (kg/h)	175 kg/h (10 hour burn)
Charge per cycle: (kg)	1750kg
Burning rate: (kg/h)	175 kg/hr average
Off-time per cycle: (h)	6 hr cool down
Heat value: (kJ/kg or BTU/lb)	5125 BTU/lbs (Solid and Sewage sludge mixed waste)

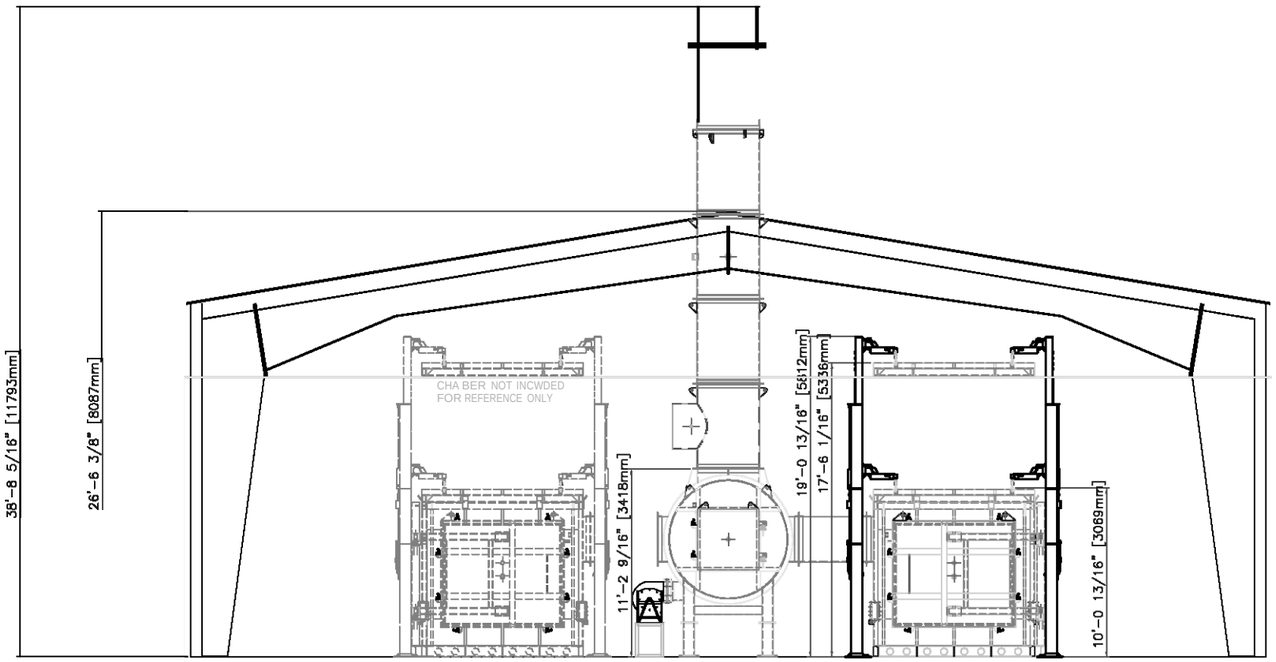
**The emission estimates provided are given as volumetric concentrations or pollutants; as per test reporting standards. Estimates are based on previous air emission tests.

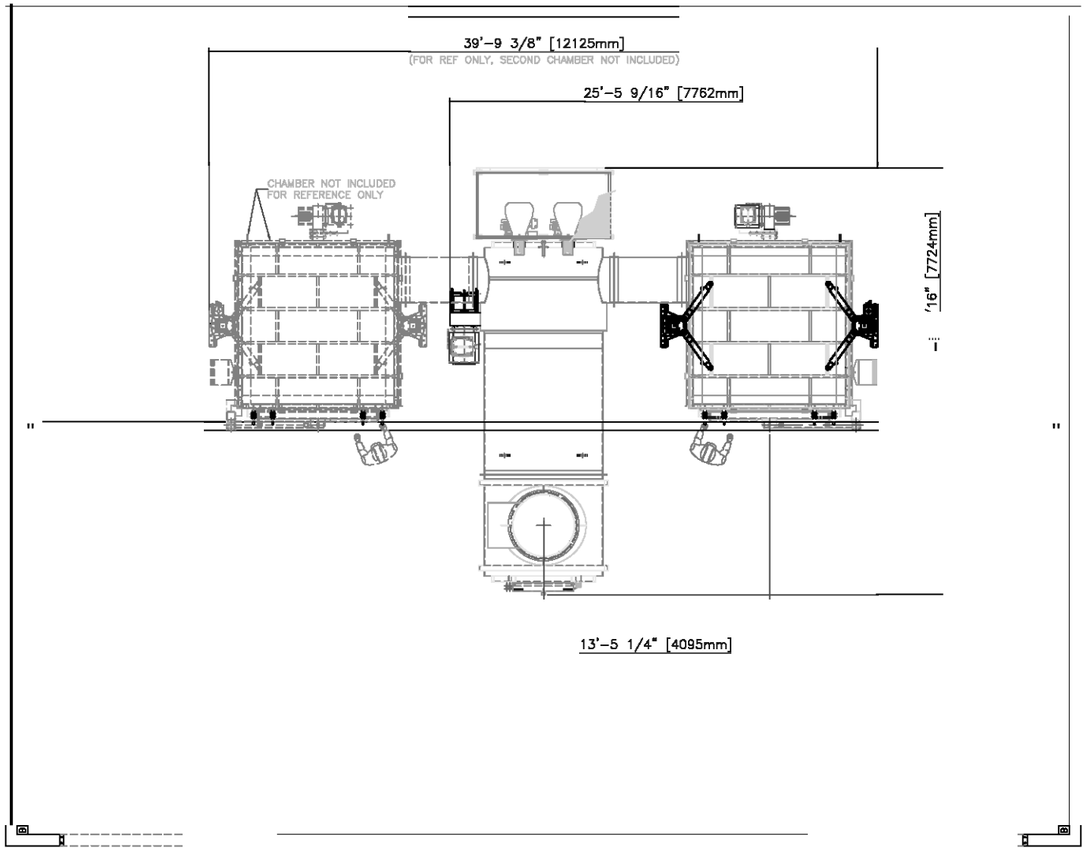
	Fuel mixing ratio with waste oil (if applicable)	N/A
	Capability to burn waste oil with loading rate (kg/h)	60.6 kg/h (8 hour liquid burn)
	Applicable auxiliary burner.	N/A
	Incinerator to bear CSA label?	All electrical components CSA or UL approved. Approval of complete incinerator package at additional cost..
	Temperature: Primary chamber (°C):	705°C
	Temperature: Secondary chamber (°C):	1000°C
	Burner Efficiency:	High
	Internal Volume of Primary Chamber:	2.43(l) x 2.43(w) x 2.29(h) m
	Internal Volume of Secondary Chamber:	1.83 (dia) x 5.49(l) m
	Destruction efficiency	95% DRE
	Tested Emission results (rates)	- See Section 1 (Emissions)
	Stack internal diameter (mm)	965mm
	Height of Stack (m)	7.62m
	Stack materials of construction	Refractory Lined - Mild Steel (44W HSLA)
	Spark Arrester length (mm)	1092mm
	Spark Arrester open area (m^2)	0.425m^2
	Burner System	Primary Burner - Riello RL28/2
		Secondary Burner - Qty(2) Riello RL100/M
		Liquid Waste Burner - Eco Waste Solution Liquid Waste Oxidizer
	Valve Train	N/A - Integrated in Burners
	Charging System	N/A - Batch System
	Charging opening size	1.78m (w) x 1.43m(h)
	Charging Chute size	N/A - no chute
	Ash Removal System	N/A - Manual
	Expected ash production per cycle (kg)	200kg (estimated)
	Maximum Capacity of ash removal system	N/A
2.	**Materials of Construction**	
	External Casing	Mild Steel (44W HSLA)
	Spark Arrester	Stainless Steel (SS 304)
	Insulation in Primary Chamber	Walls - Ceramic Fibre Blocks (152mm (6") Thick)
		Floor, Door Sills & Breech entrance - Castble (101 - 152mm (4-6") Thick)
	Insulation in Secondary Chamber	Walls - Ceramic Fibre Blocks (152mm (6") Thick)
		Breech exit & Stack Entrance - Castable - (76 -152mm (3-6") Thick)
	Insulation in Stack (materials and thickness)	Insulating Castable (76mm (3") Thick)
	Charging Chute	N/A
	Paint System Used	Carboline - Silicon Zinc Primer, Silicon Finish
	Dry Film Thickness of Paint	Primer - 2 mils (50 micron)
		Final Coat - 2 mils (50 micron)
	Primary Chamber Burner Rating	(663 - 1266)x10^3 KJ/hr
	Secondary Chamber Burner Rating	(1582 - 6119)x10^3 KJ/hr
3.	**BLOWERS**	
	Blower Manufacturer	New York Blower
	Primary Chamber Blower Capacity (m^3/hr)	2696
	Primary Blower Pressure (kPag)	0.25
	HP/ RPM	1.15 hp @ 2200rpm
	Secondary Chamber Blow Capacity (m^3/hr)	4247
	Secondary Blower Pressure (kPag)	0.5
	HP/ RPM	1.9hp @ 4900 RPM
4.	**CONTROL SYSTEM**	
	Please list all instrumentation and details including	- Please See Appendix A (Attached)
	CSA approval and labelling:	

5.	**INCINERATOR BUILDING (if applicable)**	
	Overall Length (mm)	12 192mm
	Overall Width (mm)	12 192mm
	Overall Height (mm)	6420 mm
	Shipping Dimensions (mm)	6660 x 3050 x 914 mm
6.	**DIMENSIONS**	
	Overall Length (mm)	6 858 mm
	Overall Width (mm)	7 188 mm
	Overall Height (mm)	11 049 mm
	Shipping Dimensions (mm)	**Largest Pieces (L x W x H) mm**
		Primary Chamber - 3403 x 3225 x 2895
		Secondary Chamber - 6172 x 2413 x 2794
		Shipping Container - 12 000 x 2438 x 2591
7.	**WEIGHTS (KG)**	
	Incinerator	20 275 kg
	Stack	4082 kg
	Blowers & Burners	400 kg (Blowers) 580 kg (Burners)
	Total Weight	25 337kg

FOR: REVIEW ONLY.

BILL OF MATERIAL		
11M. QIY.	DESCRII'TION	WEIGHT kg.





REV.	DESCRII'TION	APPROVED

DRAWN: J.S.	DAIE: 19-08-0B	BCO WASTE !, !: TIONS
CHECKED:	DAIE:	
PROJECT NAL.E: HATCH — MEADOWBANK		CUSTOLIER P.O.
PROJECT NUMBER: MDB-S-268		CUSTOMER EQUIPMENT. T
SCALE:	JOB .NO: OB-2MS	TITLE: BUILDING DRAWING HATCH MEADOWBANK
THIRD ANII.E -$8		DWG. NO. MDB-EC01.75TN1PMS60L-XXX REV.

APPENDIX II

ANNUAL COMPLIANCE AND REPORTING TEMPLATE

Appendix 2
Annual Report for
Incinerated Waste Management

Contact Information			
Company Name:			
Contact Name:		**Position**	
Contact Email:			
Address			
City/Town:		**Province:**	
Postal Code:			
Telephone:		**Fax:**	

Incinerator Data and Information

Name of Emission Unit	

Type of Process	

Description of Process	

Description of Material Produced from incineration	

Manufacturer of Emission Unit	

Model No.	

Dates of Commencing:	**Date**
Construction	
Operation	
Modification	

Operating Information	**Hour/day**	**Days/week**	**Weeks/year**
Maximum Operating hours			
Average Operating hours			

Annual Throughput	Dec-Feb (%)	Mar-May (%)	Jun-Aug (%)	Sep-Nov (%)

Incinerator Charging Rate	Maximum (kg/day)	Average (kg/day)	Annual (tonnes/year

Appendix 2
Annual Report for
Incinerated Waste Management

Waste Description	Maximum Rates		Average Rates	
Type of Waste Material	kg/day	tonnes/year	kg/day	tonnes/hour

Fuel Usage Data	Maximum	Typical
Firing rate		

Fuel Type	

Sector Determination:	Check Applicable Box
Municipal Waste Incineration	
Sewage Sludge Incineration	

Stack Emissions Tests For Compliance (must be corrected for 11% oxygen)

	Date	Test 1	Test 2	Test 3	Average	**Compliance (check)**
Furans and Dioxins						
Mercury						

Provide Test method details:

Appendix 2
Used Oil Impurity Limits

Contact Information			
Company Name:			
Contact Name:		**Position**	
Contact Email:			
Address			
City/Town:		**Province:**	
Postal Code:			
Telephone:		**Fax:**	

Volume of Used Oil Generated:	

Volume of Used Oil incinerated/Cons	

Sample Analysis:

Flash Point:	

Impurity	**Units**	**Maximum Level Allowed**	**Sample #**			
Cadmium	ppm	2				
Chromium	ppm	10				
Lead	ppm	100				
Total Organic Halogens (as chlorine)	ppm	1000				
Polychlorinated biphenyls	ppm	2				
Ash content	%	-				

Volume of Products Produced from Used Oil Use:

Maintenance Performed on Incinerator:

Destination of Used Oil not Incinerated:

Appendix 2
Guidelines for Ash Testing
Environmental Guidelines for Industrial Waste Discharges

Parameter	Concentration maximum (mg/L)	Sample Number		
Ammonia Sulphide	100			
Benzidine	100			
Benzyl Chloride	100			
Enthalamine	100			
Ethylenediamine	100			
Maleic Anhydride	100			
Potassium Permanganate	100			
Quinoline	100			
Strychnine	100			
Tetrachloroethanes	100			
Arsenic	2.5			
barium	100			
Cadmium	0.5			
Carbon tetrachloride	0.5			
Chromium	0.5			
Cyanide (free)	20			
DDT	3			
Endrin	0.02			
Heptachlor + Heptachlor epoxide	0.3			
Lead	5			
Lindane	0.4			
Mercury	0.1			
Methoxychlor	10			
Methyl ethyl Ketone	200			
Metolachlor	5			
PCBs	50*			
Selenium	1			
Silver	5			
Tetrachloroethylene	3			
Toxaphene	0.5			
Trialomethanes	10			
2, 4, 5-TP (Silvex)	1			
Zinc	500			

* based on concentration by mass

APPENDIX II

MBK-SIT-0011 – INCINERATOR LOADING

Incinerator Loading

	PROCEDURE NUMBER:	**MBK-SIT-0011**	
People concerned	• **Agnico-Eagle employees working on the AWPR**	**Prepared by**	Site Services
		Approved by	Roger Sauvé, Site Services General Foreman
Issuing date :	2011-11-30		
This procedure corresponds to the required minimum standard. Each and every one also has to comply with the rules and regulations of the Nunavut Government in terms of health and safety at work.			

Objective:

To load the incinerator

Concerned departments:

Site services

Required equipment

- Proper Protective Equipment: mask, glasses, fire retardant coveralls, welding gloves, rechargeable mask, face shield

Impacts

Health & Safety

Process/Quality

Costs

Environment

Incinerator Loading

Procedure	Risks/ Impacts
1. There are 2 BLUE ash bins, one of which has an ORANGE spray on it. There is a sign on the yard which indicates a cold and hot side. The one with the cold side could be dumped into the roll off. 24 hours after ash deposition	 Prevent incident and /or accident
2. After the dumping of the ash bin, inspect the roll off bin to ensure there is no red hot ash that will start a fire	
3. If there is smoke or red ash seen, ask the team leader to arrange for the small water truck located in the incinerator to give it a good spray of water to avoid a fire	
4. Bring empty ash bin into the incinerator building for the new batch	
5. Go outside of the incinerator and move the ash bin from the hot side to the cold side	
6. Close the breaker switch to the OFF position for the primary chamber and lock it using Ensure a “Zero State of Energy” and follow lock-out- Tag out Standard MBK- HSS-0010	
7. Turn on the primary chamber exhaust vacuum system	
8. Open the door and make sure the burn is good; If not: call the supervisor or team leader	
9. Tie the door in the open position for safety	

10. Empty the chamber and remove all ashes using large shovels into the ash bin	
11. When taking out the fresh ash bin, make sure to put on the hot side of the sign	
12. Once the chamber is completely cleaned, load the bottom row with medium wet bags	
13. Put two layers of contaminated cardboards and contaminated rags	
14. Put one row of dry garbage bags	
15. Put two more layers of cardboard and rags	
16. Put one row of dry to wet bags	
17. Continue the same way and finish with the wet bags on top and no cardboards (this will help keep the flames from coming up and also prolong the life of the chamber since the flames are not in direct contact with the top wall of the chamber, it will also cut down on having to reset the burner which is caused by the flame being high at the top)	
18. Close the door and make sure all the locking latches are in proper position	

19. Turn off the primary chamber exhaust vacuum system	
20. Unlock the primary chamber breaker and turn it to the ON position	
21. Start the burning cycle - Never open the door after the start - If the burner does not start, call team leader or supervisor	
22. Do not store any flammable products around the primary and secondary chambers within the marked area - Never add any accelerant into the chamber to help the start	