SNAP LAKE MINE
EXTENDED CARE AND MAINTENANCE
WASTE MANAGEMENT PLAN

April 2016
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## Revision History

<table>
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<tr>
<td>The entire plan has been updated to reflect the suspension of operations and extended care and maintenance of Snap Lake Mine. This plan maintains the major revisions noted below and is considered an addendum to the previously approved Waste Management Plan provided to the MVLWB in November 2015.</td>
<td>April 2016</td>
<td>Throughout document</td>
</tr>
<tr>
<td>Table numbers were updated with the inclusion of a new section in the Waste Management Plan</td>
<td>November 2015</td>
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<tr>
<td>Table 1 Waste Streams updated to include contaminated soil</td>
<td>November 2015</td>
<td>2.4 pages 1</td>
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<td>Updated to include modification to have two lined containment facilities as part of the waste management area</td>
<td>November 2015</td>
<td>2.5, page 16 2.5.1, page 16</td>
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<td>“On-site disposal” the Hazardous Waste Containment Facilities were included on the list replacing the landfarm</td>
<td>November 2015</td>
<td>3.0, page 19</td>
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<td>“Bulk Sample Pit” was added to the options list for on-site domestic waste disposal. (page updated as per SLEMA request)</td>
<td>November 2015</td>
<td></td>
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<tr>
<td>Statement regarding 2014 stack testing was provided and updated as per Snap Lake Mine Environmental Monitoring Agency Request</td>
<td>November 2015</td>
<td>3.1, page 20</td>
</tr>
<tr>
<td>Water Management associated with landfill was removed and included in a new section for both the landfill and the Waste Management Areas.</td>
<td>November 2015</td>
<td>Removed 3.4 page 22 New 3.6, page 31</td>
</tr>
<tr>
<td>Hazardous Waste Containment Facilities operation and management were updated and included to replace</td>
<td>November 2015</td>
<td>3.5, pages 25 to 30</td>
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the old “landfarm” that will be decommissioned as part of the West Cell development.

<table>
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<th>Previous Revisions (Page numbers no longer valid)</th>
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<tr>
<td>Statement regarding use of old sewage treatment plant versus new plant, which had filter issues.</td>
<td>October 2015 submission</td>
<td>1.3, page 6</td>
</tr>
<tr>
<td>Oily rags were listed as an incinerated item, however, they are actually backhauled.</td>
<td>October 2015 submission</td>
<td>2.4, page 13 (Table I)</td>
</tr>
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<td>“ Bulk Sample Pit” was added to the options list for on-site domestic waste disposal.</td>
<td>October 2015 submission</td>
<td>3.0, page 19</td>
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<td>Statement regarding 2014 stack testing was provided.</td>
<td>October 2015 submission</td>
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<td>The statement “weight and burn temperatures are automatically recorded on the incinerator Programmable Logic Controller” was added</td>
<td>October 2015 submission</td>
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<td>Bulk Sample Pit use</td>
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<td>Water treatment capacity volume was revised</td>
<td>October 2015 submission</td>
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<td>October 2015 submission</td>
<td>9.3, page 36</td>
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</table>
ACRONYMS

AN Ammonium Nitrate
ANFO Ammonium Nitrate Fuel Oil
ARD Acid Rock Drainage
BMP Best Management Practices
CCME Canadian Council of Ministers of the Environment
De Beers De Beers Canada Inc.
EMS Environmental Management System
GNWT Government of the Northwest Territories
MBR Membrane Bioreactors
MSDS Material Safety Data Sheet
MVLWB Mackenzie Valley Land and Water Board
NFCC National Fire Code of Canada
PAG Potentially Acid Generating
PPE Personal Protective Equipment
POL Petroleum, Oils, and Lubricants
SBR Sequencing Batch Reactor
SHE Safety, Health, and Environment
SHE OP Safety Health and Environment Operating Procedure
SNP Surveillance Network Program
STP Sewage Treatment Plant
TDG Transportation of Dangerous Goods
WHMIS Workplace Hazardous Materials Information System
WMP Water Management Pond
WTP Water Treatment Plant
1.0 INTRODUCTION

De Beers Canada Inc., (De Beers) owns and operates the Snap Lake Mine, a diamond mine located approximately 220 kilometres (km) northeast of Yellowknife, Northwest Territories. Final regulatory approvals for construction and operation of the mine were granted in May 2004, and construction began in April 2005. Operation of the mine started in 2007. On December 4, 2015 De Beers suspended operations at Snap Lake Mine. This waste management plan is provided as an addendum to the Operational Waste Management Plan to detail the practices that will be carried out during extended care and maintenance.

1.1 Environmental Management Policy

De Beers is committed to the goal of sustainable development. This approach requires a balance between the protection of human health and the natural environment with the need for economic growth. To meet this goal of sustainable development, De Beers looks to maintain safe and efficient transportation, storage, handling, and use of all hazardous materials including but not limited to hydrocarbon products, ammonium nitrate and associated explosive materials. Diligence in the application of technically proven and economically feasible environmental protection measures will be exercised throughout exploration, mining, processing, and decommissioning activities, to meet the requirements of legislation and to ensure the adoption of Best Management Practices (BMP). De Beers’ policy is to:

- assess, plan, construct, and operate its facilities in compliance with all applicable legislation;
- provide for the protection of the environment, employees, and the public;
- foster research directed at expanding scientific knowledge of the impact of the industry’s activities on the environment, of environment/economy linkages, and of improved treatment technologies;
- work proactively with government and the public in the development of equitable, cost effective, and realistic laws for the protection of the environment; and,
- enhance communications and understanding with government, employees, and the public.
De Beers’ Environmental Management Policy also states that the company will “protect the environment through the wise use of resources and prevention of adverse environmental impacts, including pollution prevention”.

The primary focus of the wise use of resources is the conservation of raw materials. This is the “Reduce” component of the “Reduce, Reuse, Recycle” philosophy. The monetary and environmental costs to replenish raw materials by air and/or ice road to a remote location such as the Snap Lake Mine are significant and it is recognized that the physical replacement and consumption of raw materials depletes natural resources. Moreover, a small reduction in the consumption of raw materials may have far reaching benefits environmentally. Each person at the mine has the responsibility to be an active participant in reducing waste generation at source.

The secondary focus is the proper disposal of waste. This includes the implementation of “reuse and recycle” which minimizes waste. It also includes final disposal in the appropriate facility.

1.2 Objectives and Scope

The collection, storage, transportation, and disposal of all wastes generated during care and maintenance will be conducted in a safe, efficient, and environmentally compliant manner. De Beers recognizes the importance of achieving these goals and outlines their commitment in the preparation of this Plan.

The overall goal for this Plan is to create a framework for the proper handling and disposal of waste, the minimization of potentially adverse impacts on the environment, and compliance with the mine’s Water License and other regulatory guidelines for waste management. To meet this overall goal, the Plan has been developed to address the following four specific objectives:

- to describe domestic wastes generated at the mine site;
- to establish the principles of hazardous materials management during the operation of the Project;
- to outline practices and procedures for the collection, storage, transport, and disposal of those wastes; and
- to present monitoring and mitigation procedures for domestic wastes.
The Plan also outlines procedures that promote reduction, recovery, reuse, and recycling of waste streams. The storage handling, treatment and disposal of mine waste water is included in the Mine Water Management Plan. The handling, deposition, and logging of mine waste, including potentially acid generating rock (PAG) and processed kimberlite (PK) are covered in the North Pile Management Plan and Acid Rock Drainage (ARD) plan.

As a minimum standard of acceptability, the Plan will be compliant with the Snap Lake Mine EMS, environmental laws and appropriate sections of the following Acts and associated Regulations, and Guidelines:

- Canadian Environmental Protection Act;
- Department of Indian Affairs and Northern Development Act;
- Environmental Protection Act;
- Fisheries Act;
- Hazardous Products Act;
- Northwest Territories Waters Act;
- Transportation of Dangerous Goods Act;
- Territorial Environmental Health Act;
- Territorial Lands Act;
- Territorial Public Health Act;
- NWT Guidelines for General Management of Hazardous Waste; and,

Compliance will be monitored using the following mechanisms:

- On site compliance monitoring;
- Inspections;
- Environmental audits (internal and external);
- Communication with regulatory authorities (federal, provincial, regional, and municipal); and,
- Communication with other De Beers facilities.

The Plan gives consideration to the following as discussed in the Board waste management hierarchy:
- reducing volumes of waste through established plans and procedures;
- reducing waste disposal costs;
- prevention and reduction of adverse impacts on the environment including wildlife and fish, and their respective habitats;
- the health and safety of site personnel and visitors;
- the environmental integrity of soil, and water;
- maximizing the efficient use of resources; and,
- ensuring due diligence by contractors, vendors, and management.

As part of the overall continuous improvement process for the mine site, De Beers have established Safety, Health, and Environment Operational Procedures (SHEOPs) integrated within the De Beers EMS system. These operational procedures are reviewed on a regular basis and updates are completed as required on an ongoing basis.
1.3 Land Fill Status

The landfill will be operated during the life of the mine in areas designated within the North Pile footprint. Currently the landfill is located in Cell 1 of the East Cell. There is an approved option to relocate the landfill to the West Cell, however in light of care and maintenance the construction of the West Cell has been put on hold.

1.4 Waste Management Strategy for Care and Maintenance

As the mine is located in a remote site, quantities of materials are transported and stored on-site to ensure availability of supplies during the periods when winter road access is not available. To address this volume of waste, the waste management strategy for operations will continue to focus on the following:

- reduction of the amount of material consumed wherever possible. These measures include the following:
  - use of bulk containers for items used in large quantities (i.e., lube oil, cooking oil, beverages);
  - tire recycling (where opportunities exist); and
  - use of waste oil for heat generation (waste oil burners in place in selected site facilities).
  - selection of environmentally friendly packaging where possible;
  - appropriate separation of waste for on-site and off-site disposal;
  - effective and efficient disposal of waste on-site;
  - appropriate storage of waste awaiting removal from site; and,
  - transportation of waste to an appropriate off-site facility for reuse, recycling, or disposal.
2.0 DESCRIPTION, IDENTIFICATION, CLASSIFICATION, AND STORAGE OF WASTE

Waste as defined in the Water Licence means any substance defined as waste by section 2 of the Northwest Territories Water Act, which states:

“waste” means

(a) any substance that, if added to water, would degrade or alter or form part of a process of degradation or alteration of the quality of the water to an extent that is detrimental to its use by people or by any animal, fish or plant, or

(b) water that contains a substance in such a quantity or concentration, or that has been so treated, processed or changed, by heat or other means, that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water to the extent described in paragraph (a),

and, without limiting the generality of the foregoing, includes

(c) any substance or water that, for the purposes of the Canada Water Act, is deemed to be waste,

(d) any substance or class of substances prescribed by regulations made under subparagraph 33(1)(b)(i),

(e) water that contains any substance or class of substances in a quantity or concentration that is equal to or greater than a quantity or concentration prescribed in respect of that substance or class of substances by regulations made under subparagraph 33(1)(b)(ii), and

(f) water that has been subjected to a treatment, process or change prescribed by regulations made under subparagraph 33(1)(b)(iii)

Mine waste and water are discussed in the ARD, North Pile and Water Management plans.

2.1 Introduction

The management of waste requires that safety and proper techniques must be considered during transportation, handling, storage, distribution, use, and final disposal.

All hazardous materials will be labelled and classified according to Transportation of Dangerous Goods (TDG) and WHMIS regulations. Specific instructions for the storage and handling of hazardous materials are outlined in the Snap Lake Mine Operating Procedure, SHE OP 0026A Storage and Handling of Hazardous Materials. This operating procedure forms part of the Snap Lake Mine Environmental Management System (EMS).
2.2 Description

The two forms of waste generated at Snap Lake for the purposes of this Plan are domestic waste and hazardous waste. Waste related to mine operations such as slurry and paste from the Process Plant, Acid Rock Drainage (ARD), seepage from the North Pile, and discharge from the Water Treatment Plant (WTP) are covered in detail, under separate cover, in the North Pile Management Plan, ARD Plan and Water Management Plan.

Domestic waste at the mine site is considered as the waste generated from day to day operations, and is separated into two streams:

- solid domestic waste; and,
- organic waste

Waste streams incorporate the type of waste, treatment or disposal strategy, site handling methodology, and primary responsibility, as shown in Table I below.

Hazardous wastes and hazardous recyclable materials are defined as those with properties such as flammability, corrosiveness, or inherent toxicity. These wastes and materials can pose a variety of risks, from skin damage on contact to the contamination of ground water, surface water, and soil as a result of leaching into the environment.

Hazardous wastes and recyclables come from many sources, including material left over from industrial activities such as oil refining, chemical manufacturing and metal processing. Even some everyday household products such as used batteries, computers and other electronic equipment, cleansers, paints, and pesticides may be hazardous when improperly discarded or recycled.

2.3 Identification

All personnel who may come into contact with or manage hazardous materials will be trained in proper procedures. Any employees working with acids, oils, fuel, radioactive materials, or other hazardous substances must be trained on the procedure for the storage, handling, and disposal of these products, and their containers, and be made aware of the consequences of not conforming to relevant procedures. All materials are labelled by Workplace Hazardous Materials Information System (WHMIS) categories and labels.

Specific procedures for training employees in environmental safety are included in the EMS system procedure; Training and Awareness.
Responsibility for waste disposal varies depending on the waste type. All domestic and hazardous wastes are segregated, packaged, and stored in appropriate containers by Site Services personnel. Waste containers will be appropriately labelled and hazardous waste signs posted at the storage, transfer, and disposal facilities. It is the responsibility of Site Services to transport the containerized waste to the Waste Management Area. Shipments off-site will be the responsibility of the Logistics Department including compliant legislative documentation.

2.4 Classification of Waste Streams and Hazardous Materials

Due to the remote location and logistics of the Snap Lake mine site, considerable volumes of materials are transported and stored on-site to ensure availability of supplies when the winter road is not accessible. The majority of hazardous materials that will be used during mining can be grouped into the following three site categories:

- Petroleum, Oils and Lubricants (POLs);
- Explosives; and
- Other Hazardous Chemicals.

Lists of hazardous materials and estimated maximum quantities that will be stored at the mine site are provided in Table II. These lists are approximate, and will be subject to change in light of care and maintenance. Miscellaneous materials are those that are used in small volumes and/or not regularly stocked on site.

Hazardous materials are classified according to the Transportation of Dangerous Goods Act and Regulations. All of the substances that fall under these regulations will be labelled to inform personnel as to their toxicity and to comply with governmental regulations. Material Safety Data Sheets are available on-line at http://ccinfoweb.ccohs.ca/msds/search.html for all hazardous materials located onsite and are available at various computer terminals located across site. No paper copies of the Sheets are used on site to prevent non conformance with the Environmental Management System. Hazardous materials will be grouped according to TDG categories by the Site Supervisor. Specific categories of hazardous materials that may be present on-site include:

- Class 1. Explosives (e.g., caps, ANFO, Emulsion, stick powder);
- Class 2. Compressed gases (acetylene, oxygen, propane tanks);
- Class 3. Flammable liquids (e.g., gasoline, diesel);
- **Class 4.** Flammable solids (e.g., calcium carbide);
- **Class 5.** Oxidizers (e.g., peroxide);
- **Class 6.** Poisonous and infectious substances (e.g., cyanide, pesticides);
- **Class 7.** Radioactive material (e.g., nuclear density gauges);
- **Class 8.** Corrosive material (e.g., caustic soda, acids); and,
- **Class 9.** Miscellaneous hazardous materials (e.g., PCBs, asbestos).

De Beers requires that all contractors and suppliers comply with Federal and Territorial TDG and WHMIS regulations for the storage, handling, and transportation of hazardous waste. For example, the shipper/receiver must ensure that the carrier or transporter has the proper placards and labelling. The shipper/receiver must also ensure that handling and storage of dangerous goods comply with TDG requirements. Labelling of containers must comply with WHMIS standards.
<table>
<thead>
<tr>
<th>WASTE TYPE</th>
<th>TREATMENT OR DISPOSAL STRATEGY</th>
<th>SITE HANDLING METHODOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DOMESTIC WASTE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>Collect and store inside incinerator building until ready for incineration</td>
<td>Same day incineration at campsite incinerators</td>
</tr>
<tr>
<td>Food Contaminated Plastics, Tin Cans, Glass</td>
<td>Collect and store in secure containers</td>
<td>Off-site disposal or within the landfill</td>
</tr>
<tr>
<td>General Camp Waste</td>
<td>Separate according to waste type</td>
<td>Recycle / Incinerate / Landfill as appropriate</td>
</tr>
<tr>
<td>Non-recyclable Plastics</td>
<td>Store in approved bins / containers</td>
<td>Landfill</td>
</tr>
<tr>
<td>Paper / Cardboard</td>
<td>Recycle and / or blend with kitchen wastes</td>
<td>Incinerate</td>
</tr>
<tr>
<td>Glass</td>
<td>Cleaned and stored in approved bins</td>
<td>Landfill</td>
</tr>
<tr>
<td>Recyclable Beverage Containers</td>
<td>Collect and store in containers until ready for backhaul on winter road</td>
<td>Recycle</td>
</tr>
<tr>
<td>Bio-hazardous Waste</td>
<td>Collect and store until ready for incineration</td>
<td>Incinerate</td>
</tr>
<tr>
<td>Sewage Sludge</td>
<td>Dewater and landfill</td>
<td>Dewater sludge in Sewage Treatment Plant (STP), bag, load in transfer bin, deposit and bury in landfill.</td>
</tr>
<tr>
<td><strong>HAZARDOUS WASTE</strong></td>
<td></td>
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<tr>
<td>Oily Rags</td>
<td>Collect and store for backhaul on winter road</td>
<td>Off-site disposal at an accredited facility approved to accept such waste</td>
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<tr>
<td>Waste Glycol</td>
<td>Collect and store for backhaul on winter road</td>
<td>Off-site disposal</td>
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## WASTE TYPE TREATMENT OR DISPOSAL STRATEGY SITE HANDLING METHODOLOGY

<table>
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<th>WASTE TYPE</th>
<th>TREATMENT OR DISPOSAL STRATEGY</th>
<th>SITE HANDLING METHODOLOGY</th>
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<tbody>
<tr>
<td>Used Oil Filters</td>
<td>Collect and store for backhaul on winter road</td>
<td>Off-site disposal</td>
</tr>
<tr>
<td>Diesel/Glycol Impacted Water</td>
<td>Collect and store for backhaul on winter road</td>
<td>Off-site disposal</td>
</tr>
<tr>
<td>Waste Flammable Liquid (Waste Jet B, Gasoline, Diesel)</td>
<td>Collect and store for backhaul on winter road</td>
<td>Off-site disposal</td>
</tr>
<tr>
<td>Waste Aerosol Containers</td>
<td>Collect and store in lined crates for backhaul on winter road</td>
<td>Off-site disposal</td>
</tr>
<tr>
<td>Batteries</td>
<td>Collect and store in lined crates for backhaul on winter road</td>
<td>Off-site disposal</td>
</tr>
<tr>
<td>Hydrocarbon Impacted Soil</td>
<td>Collect and store within the Hazardous Waste Containment Facility for ex-situ remediation or backhaul on winter road</td>
<td>On-site ex-situ remediation or off-site disposal</td>
</tr>
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### TABLE II  MAXIMUM VOLUMES OF HAZARDOUS MATERIALS STORED AT THE MINE- LEVELS WILL BE SCALED TO MEET THE DEMANDS DURING CARE AND MAINTENANCE

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>SITE CATEGORY</th>
<th>APPROXIMATE MAXIMUM AMOUNTS- LEVELS WILL BE SCALED TO MEET THE DEMANDS OF CARE AND MAINTENANCE</th>
<th>STORAGE LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel fuel</td>
<td>POL</td>
<td>50,000,000 litres</td>
<td>Tank Farms</td>
</tr>
<tr>
<td>Gasoline</td>
<td>POL</td>
<td>2,500 litres</td>
<td>-Adjacent Environment Shop</td>
</tr>
<tr>
<td>Gear Oils and Lubricants</td>
<td>POL</td>
<td>150,000 litres</td>
<td>Lay down Area 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>150,000 litres</td>
<td>Services Complex</td>
</tr>
<tr>
<td>Jet-A Fuel</td>
<td>POL</td>
<td>31,000 litres</td>
<td>Waste Management Area</td>
</tr>
<tr>
<td>Emulsion (AN + SN + oil phase)</td>
<td>Explosives</td>
<td>18 tonnes</td>
<td>-Emulsion Plant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Underground Explosives Area</td>
<td></td>
</tr>
<tr>
<td>Ammonium Nitrate</td>
<td>Explosives</td>
<td>1,800 tonnes</td>
<td>Bulk Ammonium Nitrate Storage Facility</td>
</tr>
<tr>
<td>Sodium Nitrate</td>
<td>Explosives</td>
<td>300 kg</td>
<td>Bulk Ammonium Nitrate Storage Facility</td>
</tr>
<tr>
<td>ANFO</td>
<td>Explosives</td>
<td>5 tonnes</td>
<td>Emulsion Plant</td>
</tr>
<tr>
<td>Detonator Caps and Delays</td>
<td>Explosives</td>
<td>96,000 units</td>
<td>Underground Explosives Mag</td>
</tr>
<tr>
<td>Tentex Boosters</td>
<td>Explosives</td>
<td>19,000 units</td>
<td>Underground Explosives Mag</td>
</tr>
<tr>
<td>Windshield Washer Fluid</td>
<td>Other Hazardous Materials</td>
<td>9,500 litres 500 litres</td>
<td>- Warehouse - Services Complex</td>
</tr>
<tr>
<td>Ethylene Glycol</td>
<td>Other Hazardous Materials</td>
<td>4270 litres 16,176 litres 3300 litres</td>
<td>-Lube Shop -Powerhouse -Laydown 1</td>
</tr>
<tr>
<td>Propylene Glycol</td>
<td>Other Hazardous Materials</td>
<td>Only what is used in current system circulation</td>
<td>None stored</td>
</tr>
<tr>
<td>Propane</td>
<td>Other Hazardous Materials</td>
<td>95 (20 lbs) 20 (100 lbs)</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Acetylene</td>
<td>Other Hazardous Materials</td>
<td>30 bottles</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Oxygen</td>
<td>Other Hazardous Materials</td>
<td>60 bottles</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Paint</td>
<td>Other Hazardous Materials</td>
<td>500 litres</td>
<td>Laydown Area 1</td>
</tr>
</tbody>
</table>
### Material Site Category Approximate Maximum Amounts - Levels will be Scaled to Meet the Demands of Care and Maintenance Storage Location

<table>
<thead>
<tr>
<th>Material</th>
<th>Site Category</th>
<th>Approximate Maximum Amounts - Levels will be Scaled to Meet the Demands of Care and Maintenance</th>
<th>Storage Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvents</td>
<td>Other Hazardous Materials</td>
<td>500 litres</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Sulphuric Acid (Batteries)</td>
<td>Other Hazardous Materials</td>
<td>0 litres (batteries are sealed)</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Sulphuric Acid (water treatment)</td>
<td>Other Hazardous Materials</td>
<td>109,000 litres</td>
<td>Outside Utilities Bldg.</td>
</tr>
<tr>
<td>Lime</td>
<td>Other Hazardous Materials</td>
<td>18,360 kg</td>
<td>Sewage Treatment Plant # 2</td>
</tr>
<tr>
<td>Sodium Hypochlorite (12%)</td>
<td>Other Hazardous Materials</td>
<td>500 litres</td>
<td>Potable Water Plant</td>
</tr>
<tr>
<td>Cement</td>
<td>Other Hazardous Materials</td>
<td>20,000 tonnes</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Concrete Additives</td>
<td>Other Hazardous Materials</td>
<td>2,000 litres</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Curing Compounds</td>
<td>Other Hazardous Materials</td>
<td>100 litres</td>
<td>Laydown Area 1</td>
</tr>
<tr>
<td>Flocculants</td>
<td>Other Hazardous Materials</td>
<td>10 tonnes</td>
<td>- Process Plant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Water Treatment Plant</td>
</tr>
<tr>
<td>Ferric Sulphate</td>
<td>Other Hazardous Materials</td>
<td>17,000 kg</td>
<td>Water Treatment Plant</td>
</tr>
<tr>
<td>Ferrosilicon</td>
<td>Other Hazardous Materials</td>
<td>500 tonnes</td>
<td>Process Plant</td>
</tr>
<tr>
<td>Alum</td>
<td>Other Hazardous Materials</td>
<td>2,000 litres</td>
<td>Laydown Area 1 Whse</td>
</tr>
</tbody>
</table>

#### 2.5 Storage of Wastes

At the mine site, hazardous materials will be stored in various locations associated with their intended use to minimize site transport and handling requirements. All hazardous, non-combustible and contaminated waste materials will be temporarily stored in the lined berm of the Waste Management Area inclusive of the Hazardous Waste Containment Facilities (HWCF) Area A and Area B (if constructed). All waste will be contained in sealed, steel, or plastic drums and shipped off-site for disposal or recycling or in the case of hydrocarbon impacted material, bulk deposited within the waste management area. Hazardous waste storage locations can be found in Table II above,
Figure I shows the overall site plan for the Snap Lake Mine, locations of the current and previous landfill locations are depicted in Figure II and gps coordinates of waste related areas and facilities are provided in Figure III below.

These storage locations and facilities will follow all the protocols mentioned in this Waste Management Plan. All containers used to store hazardous materials will be closed and sealed when not in use. All storage facilities will be in compliance with the GNWT legislation and the National Fire Code of Canada (NFCC). All storage tanks will be regularly inspected and maintained as per regulatory requirements. Storage facilities will be clearly identified with proper labelling as storage facilities for hazardous materials. They will also be well ventilated in order to prevent the build-up of toxic fumes or dust, which could harm both the personnel present and the environment. The facilities will be secured and only authorized personnel will have access to the area.

2.5.1 Waste Management Area

The waste management area is the primary location for waste storage. Located in the waste management area are two incinerators, and, if constructed, two lined and bermed area for hydrocarbon and hazardous wastes storage (HWCF Areas A and B), wooden crates containing recyclable materials such as aluminium cans and copper wire, a burn pit, and totes and bins containing other items stored until they can be backhauled off site.

2.6 Protective Clothing and Equipment for Hazardous Materials

It is of the utmost importance that personnel are aware of waste products they are handling and wear appropriate personal protective equipment (PPE) as outlined by WHMIS and TDG regulations and the Snap Lake Mine Operating Procedures. Appropriate protective equipment and clothing, spill kits, and MSDS will be available to personnel responsible for the transportation, handling, storage, distribution, use, and disposal of hazardous materials. These safety items will be available in every vehicle that transports these goods, and in all facilities that store and handle hazardous materials.

2.7 Emergency Measures

The Snap Lake Mine Spill Contingency Plan has been prepared in accordance with the MVLWB’s “Guidelines for Contingency Planning”. The plan outlines the response organization, reporting responsibilities, and procedures for spills. It provides specific information about site facilities, response plans, and the training of response teams.
3.0 ON-SITE DISPOSAL

The overall waste management philosophy, under De Beers’ environmental policy, is based on the following principles:

- Health and safety all of site employees and visitors is paramount.
- The “Three R” principles (Reduce, Reuse and Recycle) will be implemented.
- Treatment, disposal and management of waste will be performed on site to the maximum practical and economic extent in order to minimize the volume of waste shipped off site.
- The generation of wastes that may attract wildlife or the interaction between humans and wildlife will be minimized.
- Measures will be implemented to reduce waste generation at the source and minimize wildlife attractants.
- A materials procurement policy will stipulate which types of materials are prohibited on site, due to known unacceptable waste products, and will require that products with minimal waste generation be given priority over alternatives where economic and practical.
- Waste management principles and procedures will form a fundamental component of personnel site orientation and education. This program will be enforced by site management personnel, through regular site inspections and auditing.

Efforts will focus on recycling and reuse where possible. Waste oil will be used as an alternate fuel source to offset diesel oil consumption for heating some of the ancillary buildings.
Options for on-site domestic waste disposal are limited to:

- incineration;
- burn pit;
- bulk sample pit
- landfill and
- Hazardous Waste Containment Facilities;

3.1 Incineration

De Beers recently uses two Ketek incinerators (model CY-100-CA) for incineration at Snap Lake Mine.

The Ketek incinerators are capable of meeting the conditions of the Land Use Permit, under section 26(1)(i), item 54, which states “The Permittee shall select a unit that is capable of meeting an emission concentration limit of dioxans and furans of 80 pg TEQ/m³”.

Furthermore, the unit is guaranteed to be capable of meeting the NWT emission regulations and CCME guidelines. The following items are incinerated on site:

- food waste (i.e. some food containers, napkins, and wrappings);
- paper and cardboard;
- general camp and office wastes (cleaning rags, used office supplies, etc.); and
- first aid station waste.

Food waste or food-contaminated wastes are a prime wildlife attractant. It is critical that such wastes are accurately identified, sorted, and directly incinerated. The kitchen and dining room are the main sources of food waste. However, all wastes in offices are treated as food-contaminated waste and collected for direct incineration. Lunchroom waste from facilities located around the site are collected and transferred to the incinerator.

To reduce the potential for attracting wildlife, waste is placed in containers such as sealed sea cans. Incineration occurs daily to minimize long term storage of waste.

A composite sample of the incinerator ash is collected and sent to a laboratory on a quarterly basis (during periods of operation) and tested for metals, heavy metals, and various organic compounds; with the removed ash land filled at the on-site land fill area.
within the North Pile, as per the Guidelines for the Management and Operation of Landfill in the Northwest Territories.

The incinerator units have been designed and were purchased with the stipulation that if the units are maintained and operated in accordance with the vendor’s procedures the units will be operated in compliance with environmental standards, including the air quality emissions requirements.

Stack testing of the incinerators for dioxin, furans and mercury emissions was conducted in 2014 to confirm whether the incinerators were capable of meeting Canada-Wide Standards for dioxin, furans and mercury emissions. Results were reported to Environment Canada, the Snap Lake Environmental Monitoring Agency, and the Government of the Northwest Territories. While De Beers did not achieve the CWS standards for dioxins and furans through consultation with Environment Canada and the GNWT, De Beers continuous improvement and adaptive management measures have been demonstrated successful operation the equipment to-date.

The incinerators are periodically inspected by the equipment manufacturer’s representatives to ensure the units are operating optimally, and recommended maintenance requirements are met.

3.2 Burn Pit

The burn pit is located in the Waste Management Area adjacent to the North Pile drainage system. No food wastes or other potential animal attractants are placed in the burn pit. The only materials permitted for disposal include untreated timber and cardboard as per the Government of the Northwest Territories position paper on open burning.

3.3 Bulk Sample Pit

The bulk sample pit was approved to be used as a disposal area for shotcrete and concrete for the life of mine by the GNWT Inspector in 2014. The material placed in the bulk sample pit is to be inert and requires a non PAG material cover after disposal to avoid windblown debris.
3.4 Landfill

A new landfill area was established upon Board approval in 2012. The landfill has a volume of approximately 110,000 cubic meters and is currently located in cell 1 of the East Cell (Figure II), whereby waste will be deposited until it is determined that another landfill is required during West Cell construction. Items for landfill include the following waste generated at the mine site:

- non-recyclable plastics;
- conveyor belts;
- tires;
- motors, v-belts;
- piping and fittings;
- rebar;
- building and bulk debris (furniture, cladding, carpeting, drywall, insulation);
- incinerator ash;
- scrap metals;
- dewatered sewage sludge; and,
- empty cement and lime bags.

De Beers will endeavour to recycle the above items (i.e., tires, cardboard, paper, etc.) where recycling opportunities exist.
Figure II   Landfill Locations in the North Pile

- Old Landfill
- Landfill (Cell 1)
- Cell 3
- Cell 4
- Cell 5

EAST CELL
STARTER CELL
Figure III  Waste Related Locations

- Landfill
- Old Landfill
- PS-1 (Sump)
- HWCF Area B (if constructed)
- HWCF Area A
- Waste Management Area
3.5 Hazardous Waste Containment Facility Areas A and B

3.5.1 Waste Management - Hydrocarbon Impacted Materials

The following practices are used (Table III) for the management of hydrocarbon impacted material at the Snap Lake Mine:

<table>
<thead>
<tr>
<th>Waste Category</th>
<th>Material</th>
<th>Storage Area (Primary = 1°, Secondary = 2°)</th>
<th>Handling Methods</th>
<th>Disposal Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated Soil, Water, and Snow</td>
<td>Contaminated soil, Water collected from within containment berms; Contaminated snow and ice</td>
<td>Storage and/or Treatment in Waste Area B (lined with sump) 1° containment</td>
<td>Placed in lined containment area Ex-situ treatment (Landfarming, chemical amendments, soil stabilization or low temperature thermal desorption) Or Shipped Off-site in containers meeting TDG standards.</td>
<td>Shipped off-site to an approved Waste Receiver or remediated on-site. Soil meeting appropriate criteria will be used on site as authorized.</td>
</tr>
<tr>
<td>Contaminated rock not suitable remediation or bulk transport off-site.</td>
<td>Rock will temporarily be stored in the Waste Management Areas and then placed directly within the North Pile Interior Berms</td>
<td>Rock will be excavated using mining equipment and transported to the Interior Berms of the North Pile via haul truck or other suitable vehicle</td>
<td>Contaminated rock will be placed within the North Pile and covered process kimberlite to prevent migration potential due to water infiltration.</td>
<td></td>
</tr>
</tbody>
</table>
3.5.2 **Operation of Waste Area A**

Within Waste Area A, hazardous materials will be stored in various locations associated with their intended use to minimize site transport and handling requirements. All hazardous, non-combustible and contaminated waste materials will be temporarily stored in the lined berms of the Waste Management Area (Area A) bulk deposited (impacted soil) and/or contained in sealed, steel, or plastic drums and shipped off-site for disposal or recycling.

3.5.3 **Operation of Waste Area B – If constructed**

In light of Care and Maintenance, the construction of Waste Area B was put on hold. In the event that this area is deemed required during the Care and Maintenance of the Snap Lake Mine, this section has been included in this version of the plan as previously approved by the MVWLB. Potentially impacted hydrocarbon material originating from the Landfarm decommissioning or other areas of the mine over the life of the project, will be contained in Area B, adjacent to the Waste Management Area. De Beers intends to operate Area B as described in the following sections.

Impacted soil from mine operations will be sent to Areas A and B. Impacted soils will be either removed from Site to an approved waste management receiver, or remediated on-site using an ex-situ remedial technology (chemical amendments and or landfarming). Once remediated to an acceptable level, they will be considered clean fill and can be reused on-site.

3.5.3.1 **Segregation of Annual Hydrocarbon Waste Material – Batches – If Waste Area B Constructed during Extended Care and Maintenance**

Impacted soil encountered during the decommissioning of the existing landfarm will be placed within Area B. The soil accumulated will be treated together as one “batch”. Once placed in the waste area no additional soil will be added to it.

Over subsequent years, a new batch will be created (one for each operating year). It may be necessary to designate several areas within the waste area to allow sufficient time for each batch to completely remediate or be transferred off-site to an approved waste receiver. The batches will be separated by markers indicating the maximum height for the soil, and the year the soil batch was created. The On-site Technician will direct orange snow fencing to be laid down to indicate the batch area for the year, and to protect the liner from inadvertently being damaged.

3.5.3.2 **Disposal of Oversize Rock**

Oversize rock is any material over 3” in diameter or long dimension. The On-site Technician will designate an area for this material within Area B for the temporary storage of oversize material contaminated with petroleum hydrocarbons. The oversized material will be used for construction within the interior structures of the North Pile located greater than 30 m from the high water mark.
3.5.3.3 Procedure for Placement in the HWCFs

a. Soil Arrives at Facility

Impacted soils will be brought to the waste area from various locations in the Snap Lake Project area (initially from the Landfarm). Before the soil is placed, it must be screened to separate the soil from any oversize material (>3” diameter) that might be in the soil. Soil and oversize material are treated differently, so they must be separated.

b. Separate Soil from Oversize Material

The Operator shall separate the soil from the oversize material as follows:

- A front-end loader will be used to load the soil onto a screen to separate the oversize from <3” material.
- Once the soil and the oversize rock are separated, the material will be moved to the designated areas. The oversize rock will be used for the interior construction of the North Pile at a distance >30m from the high water mark.

c. Hydrocarbon Impacted Material Workflow

After the soil has been screened and the oversize removed, the soil can be placed in the Waste Area.
d. Final Soil Guideline Choice:
Remediation of soil in Areas A or B will have been considered a success when CCME and Canada
Wide Standards for Agricultural (Wildland) Coarse Grained criteria or an alternative satisfactory
to the GNWT Inspector are achieved for Petroleum Hydrocarbons
e. Monitoring Specific to Hydrocarbon Impacted Soil

Environmental Monitoring

Waste Management facilities are within the current monitoring network at Snap Lake Mine. De Beers existing Surveillance Network Program (SNP) Site SNP 02-06, will satisfy the requirements for monitoring to the environment as all water, in the event of an extreme event, will be directed to the North Pile ditching system and Sump 1 (PS-1). All SNP stations in this area require the sampling of hydrocarbons in water.

Soil Samples will be representative of the batch and will be sampled at a frequency that is representative of the contamination and is satisfactory to the inspector prior to re-use on Site.

f. Remedial Options for Hydrocarbon Impacted Material

Options for Remediation may include:

a. Contaminated soil transferred off-site to an approved waste facility;
b. Ex-situ Chemical Amendments (i.e. Chemical Oxidation);
c. Landfarming (Bio-remediation);
d. Soil Solidification/Stabilization (Low Temperature Asphalt); and,
e. Low Temperature Thermal Desorption.

De Beers primary method for disposal of hydrocarbon impacted material is to transfer the material off-site to an approved waste receiver. For any remediation conducted at the Snap Lake Mine, De Beers soil must achieve remedial criteria as defined in the Section 3.5.5 part d, and must be sampled at a frequency satisfactory to the GNWT Inspector as identified in Section 9.
**TABLE IV: OPERATION EQUIPMENT REQUIREMENTS**

<table>
<thead>
<tr>
<th>Work objective</th>
<th>Equipment requirements</th>
<th>Frequency of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easily visible indication of annual treatment piles</td>
<td>- Large stakes labeled with spill event (or equivalent)</td>
<td>- Annual labeling of the new treatment piles in the spring of each year.</td>
</tr>
<tr>
<td></td>
<td>- Orange snow fencing to be used for the marking of sorted piles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Annual labeling of the new treatment piles in the spring of each year.</td>
<td></td>
</tr>
<tr>
<td>Aeration/Chemical Amendment</td>
<td>- Small dozer, or equivalent to be used for the routine turning/treatment.</td>
<td>- When ground is unfrozen</td>
</tr>
<tr>
<td>Oil/water separation</td>
<td>- Oil water separator</td>
<td>- After large summer rain events and with spring melt water</td>
</tr>
<tr>
<td>Waste water transport</td>
<td>- Water tank truck and pump</td>
<td>- After large summer rain events and with spring melt water</td>
</tr>
<tr>
<td>Oversize material separation</td>
<td>- Grizzly solids screening</td>
<td>- Every time waster material is added to the WMA or Area B</td>
</tr>
</tbody>
</table>
3.5.4 **Water Management**

Any seepage produced from the landfill and Hazardous Waste Containment Facilities will be directed to catchment in the sumps of the North Pile, as per design. The water quality of the sumps is analyzed as per the Surveillance Network Program (SNP) of Water Licence MV2011L2-0004, while water quality assessments are included in the ARD Report.

Regular monitoring of the North Pile and sumps are scheduled and conducted.
4.0 OFF-SITE DISPOSAL

A recycling program for plastic and aluminum beverage containers was implemented in 2006. Beverage containers are collected from recycling bins located throughout the site buildings and stored in a sea can or crates for off-site disposal via the winter road or backhauled by air when possible. These items are then provided to interested charitable organizations within the Northwest Territories to return to Yellowknife’s Bottle Depot.

Table V lists the items that are shipped offsite and disposed of and those shipped offsite and recycled or items reused on site. Except for the beverage containers all items are recycled or disposed of by KBL Environmental Ltd, a registered Receiver of Hazardous Waste with the Government of the Northwest Territories. The ultimate disposal of hazardous waste is confirmed through the use of hazardous waste movement documents as prescribed in the Guideline for the General Management of Hazardous Waste in the Northwest Territories.

<table>
<thead>
<tr>
<th>OFF-SITE DISPOSAL</th>
<th>Recycle</th>
<th>Reused</th>
</tr>
</thead>
<tbody>
<tr>
<td>chemicals - glycol, calcium hydroxide, etc</td>
<td>tires</td>
<td>tires for protection of equipment</td>
</tr>
<tr>
<td>empty fuel drums</td>
<td>steel (structural, non-insulated piping)</td>
<td>waste oil in furnaces</td>
</tr>
<tr>
<td>dry alkaline batteries and lead acid batteries</td>
<td>empty totes (1000 litre oil / chemical)</td>
<td>wasted shotcrete for construction</td>
</tr>
<tr>
<td>hydraulic hose</td>
<td>wire - copper and aluminum</td>
<td>gear oil is reused in gearboxes on fixed equipment</td>
</tr>
<tr>
<td>fluorescent light ballasts</td>
<td>wood</td>
<td>wood</td>
</tr>
<tr>
<td>crushed and drained oil/fuel filters, oily rags</td>
<td>beverage containers (water and pop)</td>
<td>totes</td>
</tr>
<tr>
<td>contaminated water (oil)</td>
<td>water from WTP to Process Plant</td>
<td>flammable liquids (Jet B, gasoline, solvents) ERT Training</td>
</tr>
<tr>
<td>contaminated vent tubing (oily)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kitchen grease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>oil &amp; grease pails containers / vent tubing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A procedure exists for all materials movement documentation, which describes the steps required to track environmentally hazardous waste from the generator to final disposal. The procedure covers the personnel responsible for tracking and submitting the paperwork to regulators.
The Environment Protection Service of the GNWT monitors movement of hazardous waste through use of a tracking document called a *Movement Document/Manifest*. The *Movement Document/Manifest* form must accompany all regulated (hazardous) waste in transit regardless of the means of transport (air or road).
5.0 SEWAGE TREATMENT

The new STP is monitored at SNP 02-16i with compliance measured at the end-of-pipe discharge SNP02-17b. The sewage treatment plants include phosphorus removal as part of an overall water management strategy to meet the total phosphorus loading limit set out in the Water License. The operational parameters are listed in Table IV below:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Daily Permeate Flow</td>
<td>135 m³/day</td>
</tr>
<tr>
<td>Maximum Operating Temperature</td>
<td>30 °C</td>
</tr>
<tr>
<td>Minimum Operating Temperature</td>
<td>4 °C</td>
</tr>
<tr>
<td>Bioreactor TSS - Minimum</td>
<td>3000 mg/L (ppm)</td>
</tr>
<tr>
<td>Bioreactor TSS – Optimal Operational Range</td>
<td>10000 mg/L (ppm)</td>
</tr>
<tr>
<td>Membrane Inlet Pressure</td>
<td>448,175 – 517125 pa</td>
</tr>
<tr>
<td>Membrane Outlet Pressure</td>
<td>68,950-103,425 pa</td>
</tr>
<tr>
<td>Maximum Membrane Inlet Pressure</td>
<td>482,650 pa</td>
</tr>
<tr>
<td>Minimum Concentrate Flow Rate Per Train</td>
<td>120 m³/hr</td>
</tr>
<tr>
<td>Permeate Flow Rate Per Train</td>
<td>6.1 m³/hr</td>
</tr>
</tbody>
</table>

Solids produced during sewage treatment are caked, which is basically reducing the water content of the sludge, and pressed in the filter press to remove additional water. Dewatered solids are bagged and sent to the landfill.
6.0 WATER TREATMENT

The total treatment capacity, including the modular water treatment plant is approximately 75,000 m³ per day at maximum. During Care and Maintenance, De Beers is committed to meeting the Effluent Quality Criteria as identified in MV2011L2-0004.
7.0 MONITORING, MITIGATION, AND REVIEW

Compliance with all environmental laws, regulations, and guidelines, as well as the Snap Lake Mine EMS, will be monitored using the following mechanisms:

- environmental inspections;
- environmental audits (internal and external);
- communication with regulatory authorities (federal, territorial); and,
- communication with De Beers Corporate Legal Department and other De Beers facilities.

To control waste substances from entering the aquatic environment, a number of spill mitigation techniques related to handling of wastes have been implemented. Complete descriptions of spill and containment procedures can be found in the Snap Lake Mine Spill Contingency Plan.

The following list describes general practices when handling wastes:

- use of spill mats;
- replacement of leaking, corroded or otherwise deteriorated containers;
- careful unloading or loading wastes to minimize losses;
- checks of storage containers for leaks, proper labels, and lids that are on tight;
- use of plastic tarps to cover waste piles; and,
- installation of runoff berms.

As part of De Beers’ EMS, waste audits are carried out on site and some of the past recommendations have identified a number of improvements for the handling and disposal of waste and personal safety as it relates to wildlife conservation:

- conduct regular audits of all food and non-food solid waste streams, and use information to modify plans, procedures, and protocols;
- conduct external audits to review success of activities;
- fabricate a burner unit to improve disposal of large volumes of cardboard and wood wastes generated;
- implement a standardized colour-code for various waste streams; and,
- avoid storage of waste for incineration to reduce the potential for attracting wildlife. Incineration should be performed as dictated, by waste volumes generated.

The suggestions made through the auditing process were considered and where practical, are implemented.
8.0 TRANSPORTATION PLAN

8.1 Introduction

The transportation of hazardous materials to the Snap Lake Mine site will be either by winter ice road or by air. The winter ice road will be the major transportation route for bulk materials. Hazardous materials will require special handling and specific documentation to comply with GNWT and Highway Department regulations.

De Beers and their contractors will ensure that the transporters of hazardous materials are aware of their legal responsibilities. De Beers is currently a member of the Tibbitt to Contwoyto Winter Road Joint Venture and will adhere to the Tibbitt to Contwoyto Joint Venture Spill and Emergency Response Plan, and to the Rules of the Road Manual.

8.2 Contractor Requirements

Materials to be shipped to the mine site will be received by a De Beers contractor. When possible, the material will be stored indoors in a secure area. Once transported to the site, the originator of the requisition will perform the final material receipt confirmation.

All TDG and WHMIS labelled materials must have accompanying MSDS. The MSDS information is communicated between the contractor and De Beers Logistics department.

If materials are spilled while receiving, the receiver will be the first responder and contact the SHE Department and/or Materials Management to initiate the Spill Contingency Plan. A review of the MSDS for the spilled material will determine what personal protective equipment and other precautions may be required. The receiver will ensure spill kits are present at the unloading area in case a spill occurs.
9.0 PETROLEUM, OILS, AND LUBRICANTS

9.1 Introduction

The mine operations will use large amounts of Petroleum, Oils and Lubricants (POLs). These products are transported, stored, handled, and used in compliance with the appropriate legislation and with best management practices. A full year’s supply of POLs is transported to site during the winter road season this has been scaled accordingly due to reduced power requirements in light of extended care and maintenance.

9.2 Types and Quantities

The types and quantities of POLs to be stored and used are summarized in Table II.

9.3 Design and Location of POL Storage Facilities

All single-walled fuel storage tanks are contained within a perimeter berm lined with high-density polyethylene (HDPE) geo-membrane. The berm has been designed as required by the NFCC, API-650, and NWT Public Works and Services design standards.

The berms provide secondary containment for all fuel storage tanks and the capacity of the secondary containment has the equivalent to the volume of 110% of the largest tank, as per the NFCC.

Currently, Snap Lake Mine has three 12 million litre main tanks, one 10 million litre tank, and 19 small tanks (between 330,000 to 500,000 L) with a total carrying capacity of 52,998,800 L. Snap Lake Mine fuel consumption was forecasted to increase from 42,795,512 L in 2014 to 52,567,314 L by 2027. Due to extended care and maintenance, only a portion of the tanks will be used. On the 2016 winter road only 5ML of fuel was transported to Snap Lake.

9.4 Inspection and Monitoring

De Beers is responsible for formal inspection of fuel storage, dispensing pumps, and pipelines. Visual Inspections of all tanks and associated pipelines are conducted weekly or more frequent if deemed necessary. The inspection frequency will be determined by the legislation in place at that time and by Best Management Practices (BMP). De Beers will explore ways to remotely monitor the fuel storage systems (Camera’s, level transducers etc.) throughout extended care and maintenance to reduce on-site inspection requirements.
Any release of hazardous materials will be reported immediately and appropriate measures will be taken to remediate the situation. Details of reporting protocol, procedures, and remedial measures are specified in the Snap Lake Mine Spill Contingency Plan.

9.5 Records Keeping

Specific procedures for documentation of activities related to the EMS and to Safety and Health are included in the EMS system procedures under SHEOP’s.

Inventory control and reconciliation records are kept on site in an acceptable manner and format and maintained for a period of one year. They are then archived and stored on site for examination or reference if required.

9.6 Training of Personnel

WHMIS training is provided to all personnel working on-site. The Emergency Response Team will be trained in the following fields, regardless of previous training and experience: transporting, handling, and transferring petroleum products; emergency response; and WHMIS.
10.0 EXPLOSIVES

10.1 Introduction

During Care and Maintenance De Beers does not intend to manufacture explosives at the Snap Lake Mine. Explosives (if any) and other hazardous materials stored in magazines will be constantly monitored for spills, excessive humidity, stability of storage facilities and access of humans or wildlife to storage facilities. De Beers will continue to destroy mixed explosives that cannot be shipped from Snap Lake Mine as approved by the WSCC and the Chief Inspector of Mines.

This section focuses on explosives management with respect to the potential environmental hazards of each of the constituent components making up the explosive mixtures, and how to maintain personnel safety and training while working with these constituents.

The transportation, storage, or use of explosives or their constituents could result in hazardous situations or adverse environmental impacts. Procedures to prevent such an outcome are outlined in this section. These measures will ensure that the utmost safety and environmental responsibility will be maintained during the operation of the Snap Lake Mine.

10.2 Types and Quantities

The most common explosive that is used is Emulsion (a mixture of ammonium nitrate prill, sodium nitrate prill, an oil phase (typically vegetable oil based), and a solution phase (water).

10.3 Design and Location of Storage Facilities

The Bulk AN Storage Facility has been designed and constructed of suitable building foundation and base slab for support of the building and designated loads within the building. The foundation and base slab system includes an embedded membrane for the secondary containment of nitrates and corrosion reduction. The facility meets the following standards:

- National Fire Code of Canada 2005 (NFCC)
- National Building Code of Canada 2005 (NBCC)
- NFPA 490 Code for the Storage of Ammonium Nitrate
The design of the interior of the building includes two concrete walled storage areas, one for the storage of bulk ammonium nitrate and the second for the storage of bagged sodium nitrate. The total combined storage capacity is 2400 mega tonnes.

The materials handling system consists of three screw conveyors for the purpose of moving the bulk ammonium nitrate. The building houses an exhaust fan and filtering system to provide adequate ventilation for equipment contained within the building; a cathodic protection system to reduce corrosion from exposure to the ammonium nitrate and surface treatment for limiting penetration of ammonium nitrate and sodium nitrate.

10.4 Inspection and Monitoring

Explosives are strictly regulated and only qualified and certified personnel will be employed in the handling of explosives. Periodic audits of all working areas and roads used to transport the explosives will be conducted by SHE and/or Mine Operations personnel to ensure proper handling procedures are used.

Any release of hazardous materials will be reported immediately and appropriate measures will be taken to remediate the situation. Details of reporting protocol, procedures, and remedial measures are specified in the SLM Spill Contingency Plan.

10.5 Training of Personnel

WHMIS training is provided to all personnel working on-site. The Emergency Response Team will be trained in the following fields, regardless of previous training and experience: transporting, handling, and transferring petroleum products; emergency response; and WHMIS.
11.0 REFERENCES


