



BACK RIVER PROJECT Fuel Management Plan

October 2017

BACK RIVER PROJECT

FUEL MANAGEMENT PLAN

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Revision Log

Version	Date	Section	Page	Revision
1	October 2017	All	All	Supporting Document for Type A Water Licence Application, submitted to Nunavut Water Board for review and approval

Acronyms

CCME	Canadian Council of Ministers of the Environment
FMP or Plan	Fuel Management Plan
MAD	Main Application Document
MLA	Marine Laydown Area
NWB	Nunavut Water Board
Project	Back River Project
OPEP	Oil Pollution Emergency Plan
Sabina	Sabina Gold & Silver Corp.
SCP	Spill Contingency Plan
WHMIS	Workplace Hazardous Materials Information System
WIR	Winter Ice Road

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 kilometres (km) southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet (Kingaok), and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR) (Main Application Document [MAD] Appendix A, base Figure 2): Goose Property (MAD Appendix A, base Figure 3) and the Marine Laydown Area (MLA) (MAD Appendix A, base Figure 4) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites. Refer to the MAD Appendix A, base Figures 1 to 5 for general site layout and locations. A detailed project description is provided in the MAD.

The Fuel Management Plan (FMP or Plan) outlines the approach for managing hydrocarbon products that are to be stored and managed at the Project. This plan includes provisions for the MLA in southern Bathurst Inlet and the Goose Property. The FMP and other management plans are intended to support the Type A Water Licence Application for the Project.

The Plan was prepared following the requirements of the Supplementary Information Guidelines (SIG) for Mining and Milling MM3 and Water Works M1, issued by Nunavut Water Board (NWB 2010 a, b) and the Environmental Impact Statement Guidelines issued by the Nunavut Impact Review Board to Sabina (NIRB 2013) and in conformance with current Federal and Territorial statutory requirements

This plan is a living document to be updated upon changes in related regulatory requirements, management reviews, changes to facility operation or maintenance, and environmental monitoring results, best practice updates or other Project specific protocols once construction starts through to Project Closure activities. Any updates will be filed with the Annual Report submitted under the Type A Water Licence.

The information presented herein is current as of September 2017. An update will be initiated prior to the start of construction. The Plan will be reviewed as needed for changes in operation and technology and as directed by the Nunavut Water Board (NWB) in the Type A Water Licence or other regulatory authorization where appropriate. Completion of the updated Plan will be documented through signatures of the personnel responsible for reviewing, updating, and approving the Plan.

A record will document all significant changes that have been incorporated in the Fuel Management Plan subsequent to the latest review. The record will include the names of the persons who made and approved the change, as well as the date of the approval.

Sabina will maintain a distribution list providing contact details for all parties to receive the Plan including key personnel, contractors, organizations, and external agencies.

2. Scope and Objectives

The Fuel Management Plan is one of the documents that forms part of Sabina's overall Emergency Response Program for the Project. This plan has been written to meet requirements of a Type A Water Licence and applies to all Sabina projects in the Kitikmeot region.

This plan is divided into the following components:

- Applicable Legislation and Guidelines (Section 3);
- Planning and Implementation (Section 4);
- Roles and Responsibilities (Section 5);
- Facility Planning and Fuel Delivery (Section 6);
- Environmental Protection Measures (Section 7);
- Monitoring Program (Section 8);
- Mitigation and Adaptive Management (Section 9);
- Record Keeping and Environmental Reporting (Section 10); and
- Reclamation and Closure (Section 11).

This plan focusses on the environmental protection measures required for fuel management. This entails the implementation of procedures for transportation, handling, inspection, storage, transfer, reporting, and documentation for all fuel products throughout the mine life. These products include diesel, gasoline, lubricating oils, hydraulic fluids, propane, and paint thinner.

Sabina's intent is that through the diligent implementation of measures outlined in this plan the frequency and severity of spill incidents will be minimized at the mine.

2.1 RELATED DOCUMENTS

Documents within the Application for the Type A Water Licence, which support this plan include the following:

- Water Management Plan (Supporting Document [SD]-05);
- Landfill and Waste Management Plan (SD-10);
- Hazardous Materials Management Plan (SD-13);
- Spill Contingency Plan (SD-17);
- Oil Pollution Emergency Plan (SD-18); and
- Occupational Health and Safety Plan (Final Environmental Impact Statement Volume 10, Chapter 25).

In the event of a spill in the marine environment or at the MLA oil handling facility, the Oil Pollution Emergency Plan (OPEP; SD-18), or the Shipboard Oil Pollution Emergency Plan will apply. Note that the Shipboard Oil Pollution Emergency Plan is vessel specific and will be produced and approved by Transport Canada prior to commencement of shipping. In the event of a spill at the Goose Property, MLA, or along the WIR, the Spill Contingency Plan (SCP; SD-17) will apply.

3. Applicable Legislation and Guidelines

Federal and Territorial legislation that is applicable to fuel management in Nunavut is presented in Table 3-1.

Other applicable standards, systems, and regulatory bodies include:

- Underwriters' Laboratories of Canada (ULC) Standards;
- Canadian Standards Association (CSA) Standards;
- Workplace Hazardous Materials Information System (WHMIS); and
- Workers' Compensation Board (WCB).

Table 3-1. Applicable Legislation for Back River Project Fuel Management

Acts	Regulations	Guidelines
Federal		
<i>Canadian Environmental Protection Act</i> (1999 c.33)	<i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations</i> (SOR/2008-197) <i>Environmental Emergency Regulations</i> (SOR/2003-307) <i>Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations</i> (SOR/2002-301)	Canadian Council of the Ministers of Environment - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products Notice with respect to substances in the National Pollutant Release Inventory Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil
<i>Transportation of Dangerous Goods Act</i> (1992, c. 34)	<i>Transportation of Dangerous Goods Regulations</i> (SOR/2001-286)	
<i>Fisheries Act</i> (1985, c. F-14)		National Fire Code of Canada (2010)
<i>Canada Shipping Act</i> (2001, c.26)	Various	
Territorial - Nunavut and Northwest Territories		
<i>Nunavut Environmental Protection Act</i>	<i>Spill Contingency Planning and Reporting Regulations</i> (NWT Reg (Nu) 068-93) <i>Used Oil and Waste Fuel Management Regulations</i> (NWT Reg 064-2003)	Guideline for the General Management of Hazardous Waste in Nunavut Guideline for Industrial Waste Discharges in Nunavut Guideline for the Management of Waste
<i>Nunavut Waters and Nunavut Surface Rights Tribunal Act</i> (S.C. 2002, c. 10)	<i>Nunavut Water Regulations</i> (SOR/2013-69)	Guidelines for Spill Contingency Planning, Aboriginal Affairs and Northern Development Canada
<i>Territorial Lands Act</i>		
<i>Mackenzie Valley Resource Management Act</i>		

4. Planning and Implementation

The Plan considers existing (baseline) conditions, assessed potential impacts of the Project, developed conceptual mitigation strategies, and developed specific mitigation measures to execute these strategies. Conceptual strategies and plans will continue to be elaborated and executed throughout the Mobilization and Construction, Operations, and Closure phases of the Project.

Significance criteria have been developed that assist in identifying priority aspects, establish management criteria, and activity-specific mitigation measures. For social issues and effects, a key factor for determining significance is ongoing feedback from public consultation. These efforts will be used to communicate progress, and involve the public where necessary, on environmental performance.

Monitoring will be the principal mechanism to provide feedback to continually gauge the effectiveness of environmental performance. Operational control is facilitated through contractor job-specific standard operating procedures, work instructions, tailgate meetings where required, contract requirements, and service agreements. The effectiveness of physical operation controls will be reviewed and modified in accordance with preventative maintenance and procedural reviews.

5. Roles and Responsibilities

The General Manager is ultimately responsible for the success of this plan and approves all relevant policies and documents, auditing, action planning, and the verification process.

The Environmental Superintendent is responsible for ensuring regular inspection of petroleum storage facilities at the Project and will coordinate with the relevant Superintendents with respect to their areas of responsibility. All employees, contractors, and contractor employees are responsible for complying with the intent of this plan.

All manifests, training, and other tracking documentation will be maintained and kept readily available, as required, by the Environmental Superintendent or designate.

Contractors who will be interacting fuel will be trained with Sabina's FMP and in the safe handling procedures, emergency response, and spill contingency procedures consistent with Risk Management and Emergency Response Plan (SD-15), OPEP (SD-18), and SCP (SD-17). As a contractual condition with penalties, Contractors will be obliged to comply with Sabina's approvals and environmental management plans, including this plan. Sabina staff will monitor contractor performance and adherence to legislation and the commitments in the environmental management plans.

Refer to the Risk Management and Emergency Response Plan (SD-15) for additional details on roles and responsibilities related to emergency response measures.

6. Facility Planning and Fuel Delivery

6.1 FACILITY SITING AND LOCATION

Land based fuel storage facilities will be constructed and utilized at the MLA and Goose Property. The current conceptual fuel storage facility placements for each site are presented in Figures 6.1-1 and 6.1-2.

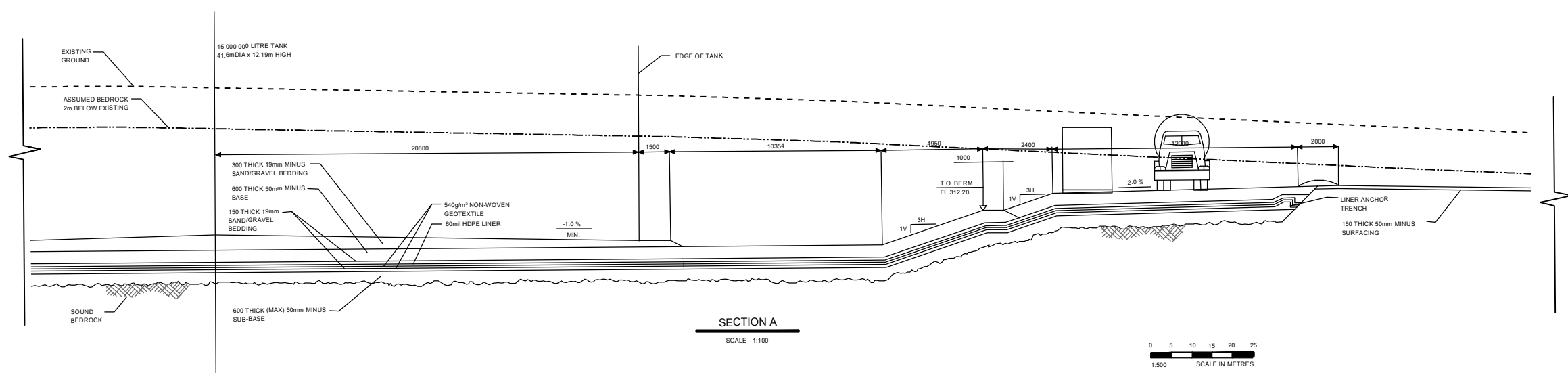
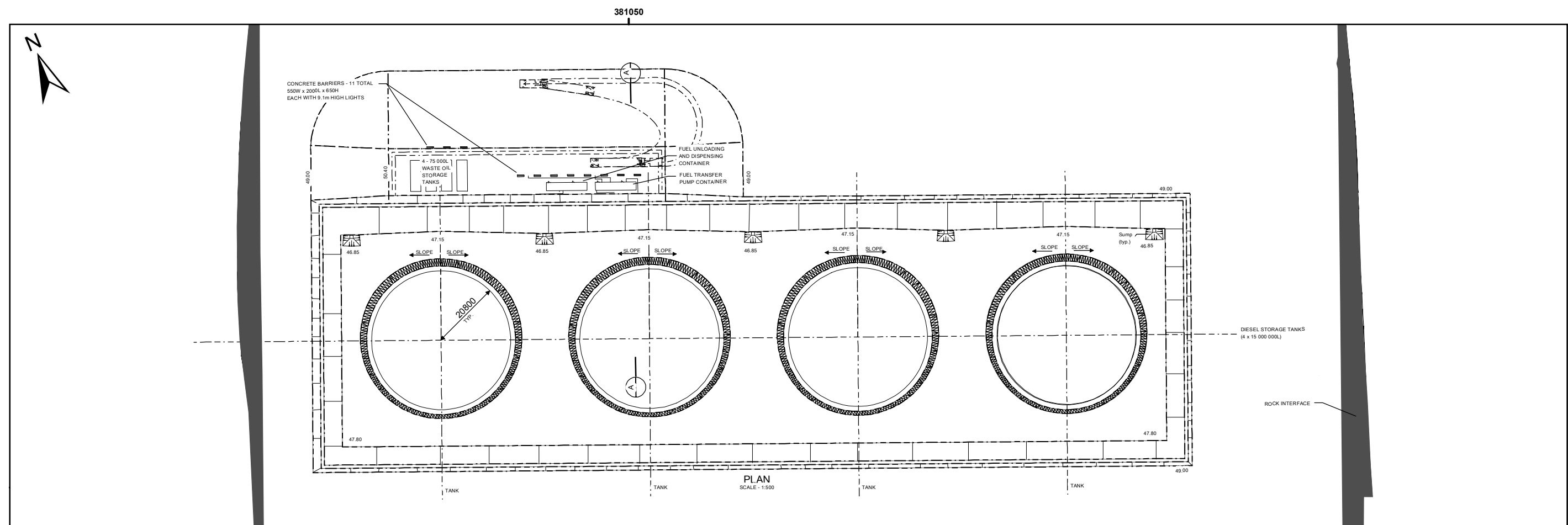
Details on the fuel storage facilities and logistical considerations are provided in subsequent sections of this plan.

Sabina is committed to providing detailed designs for construction of temporary and permanent fuel storage and fuel transfer facilities to the NWB at least sixty (60) days prior to construction of fuel storage facilities and associated infrastructure. Sabina expects the Engineer of Record or the service provider through the Engineer of Record will confirm detailed implementation plans for fulfilling contractual responsibilities including procedures and schedules for testing of all fuel containments systems. The Engineer of Record or service provider will also confirm how their fire and contingency plans needs will be confirmed and integrated into Sabina's overall Risk Management and Emergency Response Plan (SD-15).

6.2 FUEL SUPPLY

Fuel will be transported in tanker ships and/or barges, and then will be transferred through floating hose to on land storage tanks at the MLA. The summer sealift freight will originate from the east from Bécancour, Quebec or from the west from Vancouver, British Columbia, largely depending on the origin of the goods. Other points of origin, including international locations, may be considered in the future. Freight originating from Bécancour will be transported using barges and ships. Freight originating from Vancouver will be transported using barges. The ships and barges will be self-sufficient for offloading cargo. Lightering barges will be used to transfer cargo from the vessel to the MLA Marshalling Area on shore.

Fuel will be transported from the MLA to the Goose Property via WIR. The Goose-MLA WIR is approximately 160 km in length.



NOTE: mm for length and m for elevation unless otherwise noted



Marine Laydown Area
Preliminary Fuel Storage Plan and Section
Type A Water Licence

Projection: NAD 1983 UTM Zone 13N

Figure 6.1-1

ISSUED FOR PERMIT	CP	JE	16/05/26
DESCRIPTION	CHK'D	APP'D	DATE

Original Drawings Stamped
and Signed by Engineer

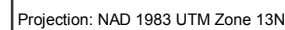
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and signed with original ink and recorded on a
Distribution Register

PROFESSIONAL ENGINEERS STAMP

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**Goose Property
Preliminary Fuel Storage Plan and Section
Type A Water Licence**

Figure 6.1-2

				<p align="center">and Signed by Engineer</p> <p align="center">This drawing is unconstructed when printed unless stamped and signed with original ink and recorded on a Distribution Register</p>
ISSUED FOR PERMIT	CP	JE	16/05/26	<p align="center">PROFESSIONAL ENGINEERS STAMP</p>
DESCRIPTION	CHK'D	APP'D	DATE	

**Original Drawings Stamped
and Signed by Engineer**
This drawing is unconstructed when printed unless stamped
and signed with original ink and recorded on a
Distribution Register

6.3 MARINE LAYDOWN AREA

The design criteria for MLA, located on Bathurst Inlet in Nunavut, includes the offloading and storing of 60 ML of diesel (Table 6.3-1). Fuel storage capacity at the MLA was calculated based on maximum annual fuel consumption. A total of four 15 ML field erected fuel tanks will be constructed at the MLA. Initially, one 15 ML fuel tank will be erected in Year -3, two more 15 ML fuel tanks will be erected in Year -2, and the fourth 15 ML tank will be installed in Year -1. Note that in advance of the large tank erected in Year -3, nine 70,000 L ISO containers or other portable fuel storage tanks will be installed at the MLA. During the Operations Phase, the portable fuel storage tanks will be used at the MLA or other sites as needed.

Table 6.3-1. Fuel Storage

Site	Ultimate Storage Capacity	Mobilization and Construction Year - 4 to -1	Operations Year 1 to 10	Peak Consumption
Marine Laydown Area	4 x 15 ML steel tanks 9 x 70,000 L ISO containers	Build and use 4 x 15 ML tanks Use nine 70,000 L ISO containers	Use 4 x 15 ML tanks Use nine 70,000 L ISO containers	2.5 ML (Year 7)
Goose Property	3 x 15 ML steel tanks 13 x 75,000 L double-walled fuel tanks	Use existing 75,000 L double-walled fuel tanks Build and use 3 x 15 ML tanks	Use 3 x 15 ML tanks	53 ML (Year 3)

Construction of the MLA will take place from Year -4 to Year -1. Initial fuel requirements will be delivered by sealift during the open water season with the vessels departing prior to winter ice formation in Bathurst Inlet.

The MLA Fuel Storage will be constructed to conform with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008). Project fuel storage facilities will be bermed to provide capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks, or 110% volume of the largest tank, whichever is greater. The fuel tank storage areas embankments (or bund) will be lined with HDPE. Fuel storage areas will be equipped with standard instrumentation and controls to monitor and safely manage the inventory in the tanks. Contact water management is covered in the Water Management Plan (SD-05) and the Landfill and Waste Management Plan (SD-10).

6.4 GOOSE PROPERTY

There are currently thirteen 75,000 L double-walled fuel tanks, one 40,000 L fuel bladder, and additional drummed fuel storage at the Goose Property. These tanks will be maintained to support ongoing exploration activities. Pending Mobilization and Construction for mine development, fuel to support ongoing exploration activities and environmental monitoring programs will continue to be either flown to Goose by aircraft or hauled to Goose by Cat-train from a supply barge at the Bathurst Inlet. The handling and storage of this fuel is currently licensed under NWB 2BE-GEO1520 and 2BE-GOO15020. Overland winter access activities (cat-train) for Sabina exploration activities is currently licensed under Kitikmeot Inuit Association land use permit: KTL304F049, and Indigenous and Northern Affairs Canada land use permit: N2017F0016. Sabina intends to maintain these licenses.

Sabina will construct a 45 ML fuel storage facility at the Goose Property (Table 6.3-1). One 15 ML fuel tank will be erected in Year -2 to support Construction, the remaining two 15 ML fuel tanks will be erected the following year. The 45 ML storage capacity will be utilized for Operations.

Construction of the Goose Property Fuel Storage will conform with CCME's requirements and the appropriate Regulations (2008). For additional information refer to Section 7.2.

Fuel dispensing equipment for mining, plant services, and freight vehicles will be located adjacent to the fuel tank bund and the fueling area will drain into the bund. A fuel transfer module will provide fuel to the Goose Power Plant day tank and diesel consumers in the Goose Process Plant. All fuel on site will be stored within secondary containment.

6.5 FUEL CONSUMPTION AND DELIVERY

Arctic grade diesel fuel will predominantly be used by mining equipment, motor vehicles, and power generation. Limited quantities of propane will be used in maintenance facilities for smaller motorized equipment and machinery, and in the accommodation complex for meal preparation.

The number and size of the fuel storage tanks for Mobilization and Construction, and Operations' activities is presented in Table 6.3-1. The anticipated quantities and volumes of fuel will vary depending on the phase of the Project. The major consumers of fuel during Pre-production at Goose Property are power generation, open pit mining, construction equipment, and earthworks.

Fuel required for Construction and Operations activities will be transported to the MLA using ocean-going vessels and trucked to the Goose Property on the WIR. Fuel may also be flown to site using a Hercules, or a Boeing 737 jet during Construction and unforeseen circumstances. The major consumers of fuel are power generation, site support, WIR construction, maintenance, haulage, and earthworks.

Fuel will be transported to the MLA via ice-class ocean-going vessels. In the first year, it will be stored in the temporary fuel tanks and in subsequent years in the permanent fuel storage tanks. Fuel may be stored on the vessel in the summer or winter season. If the freezing in of an appropriate fuel vessel is required Sabina will provide additional information to regulators 60 days prior to the activity.

7. Environmental Protection Measures

Fuel will be delivered by fuel tankers during the open water season. The floating hose method will be used for the transfer of fuel to the on land storage tanks. An OPEP (SD-18) has been developed to address fuel spill incidents related to the MLA facility.

Refuelling stations will be contained within lined and bermed areas to contain minor spills or leaks that may occur during refuelling. The liner (e.g., 40 mm Hypalon liner or equivalent) will be protected by aggregate bedding. Vehicles and mobile equipment will drive onto this bedding for refuelling.

Fuel storage areas, refuelling stations and vehicles will be equipped with spill kits. Sabina's SCP (SD-17) identifies spill kit locations and appropriate response measures for spills. The spill kits will contain appropriate types, sizes, and quantities of supplies to allow for a timely initial spill response. Larger quantities of spill response supplies will be kept in a central, accessible location.

Sabina has designed the facilities taking into account storage, location/siting, and will implement standard operating procedures and appropriate training to minimize potential for accidents and malfunctions associated with fuel management.

7.1 DESIGN REQUIREMENTS

The fuel storage facilities will be designed with features that protect the environment as per Table 7.1-1.

Table 7.1-1. Fuel Storage Facility Design Requirements

Topic / Activity	Environmental Protection Measures
Design Features	<ul style="list-style-type: none"> The CCME Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products will be followed in design, construction, and operation of the fuel storage facilities. NWT Design Rationale for Fuel Storage and Distribution Facilities All fixed location Above Ground Storage Tanks (AST) > 230 L will be constructed and maintained in accordance with Underwriters' Laboratories of Canada (ULC) tank specifications, and bear a current ULC certification plate or label. All ASTs will be installed on firm foundations designed to minimize uneven settling and corrosion, and to prevent the design stress of the tank from being exceeded. Fuel hose length will not exceed 4.5 m, or 6 m where a retracting system is used. Fuel tanks will be locked (unless enclosed by a fence) when not being used for vehicle fuelling, or when not being filled by tanker trucks. Fuel storage tanks must be vented to allow vapours to escape.
Moving Tanks	<ul style="list-style-type: none"> Where a storage tank > 230 L is removed (e.g., moved from one site to another) or abandoned, it is permitted to be reused for the storage of flammable liquids and combustible liquids only after having been refurbished and found to conform to acceptable standards. A fuel storage tank > 230 L requires spill control (or secondary containment) when it is removed from a mobile unit and installed in a fixed location. Lighting will provide adequate illumination to ensure safe fuelling and allow users the ability to read safety placards and posted fuelling procedures, and to readily locate spill response equipment.

(continued)

Table 7.1-1. Fuel Storage Facility Design Requirements (completed)

Topic / Activity	Environmental Protection Measures
Moving Tanks (continued)	<ul style="list-style-type: none"> • There must be no leaks from the valve or pipe system to the pump. Draw-off valves must be threaded at the discharge end or otherwise designed to provide a liquid tight connection to the delivery hose. • Collision protection may include concrete filled steel posts placed more than 1 m from the outer edge of the tank shell and spaced less than 1.5 m apart. Concrete barriers, if used, will have a minimum height of 750 mm and be spaced at least 500 mm from the tank shell. Posts and barriers will be painted yellow and equipped with reflective stripes. Earthen materials may be used in similar manner to serve as traffic barriers.

7.2 SITING AND STORAGE

Table 7.2-1 summarizes the fuel storage facilities siting and storage requirements.

Table 7.2-1. Fuel Facility Siting and Storage

Topic / Activity	Environmental Protection Measures
Siting and Storage	<ul style="list-style-type: none"> • Design of fuel storage facilities will meet regulatory requirements for design and operation and will apply best management practices including: <ul style="list-style-type: none"> ○ fire prevention system design appropriate and adequate for the materials being stored; ○ tanks will have a minimum 1m separation between them; ○ siting away from ignition sources and environmentally sensitive areas; ○ drums, containers, and storage areas properly labelled, marked, placarded, and secured; and ○ containers or liner materials will be matched with the materials being stored. • All tanks for fuelling operations will be placed aboveground, and outside of buildings. • Tank siting will consider site drainage and surface flow routes for fluids if spilled during tank filling or product transfers. Grading and drainage will be designed to prevent liquids from reaching waterways, drain systems, and potable water sources. • Spill response and cleanup kits will be readily available in the refuelling area.
Secondary Containment & Collision Protection	<ul style="list-style-type: none"> • Fuel storage and dispensing systems will meet all applicable Nunavut regulations and all applicable Fire Code requirements. • Large or stationary equipment will be placed in secondary containment or will have a drip pan placed under vehicle/equipment prior to commencing any maintenance. • Precipitation accumulating within the containment area will be tested and treated if necessary prior to discharge. • Water collection facilities will be designed to convey water to oil/water separators for hydrocarbon removal. • Accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage, repairs, and any follow up inspection will be reported in accordance with best practices.

7.3 FUELLING OPERATIONS AND TRAINING

Environmental Protection Measures for fuel management entail the implementation of proper transportation, inspection, storage, transfer, and use of all petroleum products. Protection measures to ensure that fuel products are managed effectively are summarized in Table 7.3-1.

Table 7.3-1. Fuelling Operations

Topic / Activity	Environmental Protection Measures
Transportation	<ul style="list-style-type: none"> • Drivers making deliveries on site will receive a site orientation that includes relevant sections of the <i>Transportation of Dangerous Goods Act</i> (1992, c. 34), <i>Transportation of Dangerous Goods Regulations</i> (SOR/2001-286), Sabina safety requirements, and site traffic protocols. • Fuels will be trucked in sealed containers, be manifested, and equipment will be labelled and placarded in accordance with <i>Transportation of Dangerous Goods Regulations</i> (SOR/2001-286). • Applicable WHMIS signage and Transportation of Dangerous Goods (TDG) placards will be identifiable on all containers during transportation and storage. • Manifests will identify fuel type, quantity, and date of all deliveries to the mine site and will be retained on file at the contractor's head office for a period of two years. • Transportation vehicles will be equipped with spill kits of appropriate size and content for initial and timely spill response. Vehicle operators will be trained in haul road safety and spill response. • Planning of delivery timing will consider weather conditions, road conditions, and availability of appropriate transportation equipment and personnel.
Bulk Transfer and Refuelling	<ul style="list-style-type: none"> • Only persons trained to safely handle fuels and aware of WHMIS and TDG requirements will implement procedures to transfer fuel. • Qualified personnel will continuously supervise the refuelling operation to ensure against overflow or spillage. • Daily inspections will be performed by the personnel responsible for the refuelling facility. • Refuelling will occur at a refuelling point with drainage capture / collection installed, in the event that refuelling occurs elsewhere, drip trays will be used under vehicles and equipment. • Refuelling and maintenance activities of equipment will not occur within 31 m of a watercourse or water body except where required due to equipment breakdown or approved activities near water. • Refuelling equipment from a tank vehicle is permitted if the fuelling is conducted using approved hose-reel and automatic closing nozzles, and appropriate training and equipment are supplied to deal with any incidental spillage. • Before fuel transfer, verify that a level shutoff device can be substituted for the person at the delivery tank, in which case operation of the shutoff should be verified each time it is used. • All connections will be bonded to prevent static discharge. • Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, should be fitted with a breakaway valve. • Propane fuel delivery vehicle tanks will be manufactured and certified in accordance with applicable regulations and equipped to ensure the safe discharging of propane to a receiving tank. • Smoking is not permitted where dispensing is being carried out. • Spill control is required for small containers of flammable and combustible liquids that have the potential to spill. • When dispensing flammable liquids, ensure that static electrical charges are controlled by establishing an electrical connection between the tank or container and truck box fill stem, or by providing other appropriate measures as applicable. • Hose nozzle valves must conform to CAN/ULC-S620-M, "Hose Nozzle Valves for Flammable and Combustible Liquids" (FC 4.5.5.2.). • Valves at the storage tank must be constructed of steel according to the Fire Code. • An automatic shutoff nozzle must be used when using an integral hold-open device. • When a hose nozzle valve with a hold-open device is used, a break-away coupling conforming to CAN/ULC-S644-M, "Emergency Break-away Fittings for Flammable and Combustible Liquids" will be provided. • Do not use any object or device to maintain the flow of fuel that is not an integral part of the hose nozzle valve assembly. • Use only manufacturer's specified pressure relief security caps.

(continued)

Table 7.3-1. Fuelling Operations (completed)

Topic / Activity	Environmental Protection Measures
Bulk Transfer and Refuelling (continued)	<ul style="list-style-type: none"> • Use fuel dispensing pumps conforming to good engineering practice, and designed for flammable or combustible liquids. • Employees will remain at the dispensing nozzle whenever they are pumping fuel from any storage tank. • Tanks must not be filled beyond their safe filling level.
Training and Review	<ul style="list-style-type: none"> • Training for fuel dispensing attendants will include procedures for: supervising the dispensing of flammable and combustible liquids; taking appropriate measures to prevent sources of ignition from creating a hazard at the dispensers; taking appropriate action in the event of a spill to reduce the risk of fire; and shutting off the power to all dispensers in the event of a spill or fire. • Fuel management training for all employees and contractors will include: evacuation procedures and routes; distributing Material Safety Data Sheets (MSDS); alarm systems; when to attempt immediate response to an emergency and when to call for help; reporting procedures for personnel; shutdown procedures for equipment and electrical systems; types of potential emergencies; procedures for handling flammable liquids; importance of good housekeeping; importance of safe work habits; and procedures for control and cleanup of leaks and spills. • Training will be provided by a combination of trained, qualified mine staff and outside training service organizations, as appropriate. Training manuals will be developed before the mine begins operation.

7.4 BULK FUEL TRUCK TRANSFER PROCEDURE

A contract service provider or Sabina will fill the storage tanks in the Goose Fuel Storage Area. General procedures will ensure that the handling of fuel will meet the applicable legislation that includes the *Transportation of Dangerous Goods Act* and the *Transportation of Dangerous Goods Regulations*. The general procedures to be followed are listed below. Similar procedures would be followed for fueling remote station tanks. Before fuel transfer, verify that:

- All fuel transfer hoses are connected properly and couplings are tight;
- Transfer hoses are not obviously damaged;
- Fuel transfer personnel are familiar with procedures;
- Personnel are located at both the fuel delivery truck/barge and fuel transfer tank(s) and can manually shut off the flow of fuel;
- If a high liquid level shutoff device is installed at the transfer tank, verify that the shutoff is operating correctly each time it is used; and
- Fuel transfer proceeds per the established procedures of the contract supplier.

Any accident or spill must be reported immediately to the Operations Superintendent or Environment Department. Notification and response procedures are detailed in the SCP (SD-17).

7.5 FUEL INVENTORY MANAGEMENT

All fuel products discussed in this plan will be transported to the Project and will be safely stored in the designated fuel storage areas as previously discussed. Total amounts of the fuel products received will be reconciled against amounts ordered. Fuel volumes will be measured (metered or manual dipping) as they are distributed for use from the bulk tanks. Inventory records will be updated when fuel is used and added to each tank. Any discrepancies will be immediately investigated.

Fuel tanks and fuelling equipment will be kept in good operating condition. The potential for inadvertent releases of product will be reduced through procedures provided in Table 7.5-1.

Table 7.5-1. Facility Monitoring and Preventative Maintenance

Topic / Activity	Environmental Protection Measures
Facility Monitoring and Preventative Maintenance	<ul style="list-style-type: none"> Vehicles and equipment will be inspected prior to mobilization to the Project and malfunctions will be rectified. Inspections will look for signs of deterioration, leaks, unsecured container lids or excess accumulation of materials in the containment areas. All visible leaks and releases will be documented and promptly corrected. Equipment and light vehicle operators will conduct daily visual inspections at the start of their shifts to ensure equipment integrity, cleanliness, and the adequacy of spill prevention material. Fuel tanks will be visually monitored on a weekly basis for signs of leakage. This will include looking for signs of corrosion, staining on the ground, and cracks or breaks in hoses and other ancillary equipment during the visual inspection. Tanks will be repaired as soon as problems are noted. Signs on tanks will be visible and legible. Containment areas will be kept clear of debris, excess snow, ice or standing water. Water within the secondary containment will be tested prior to discharge and treated if necessary. Inspection, monitoring, and record keeping for tanks will be in accordance with regulatory requirements for the Project. Inspection findings will be reviewed with transporters to correct deficiencies, maintain awareness, and to recognize negative or positive performance.

7.6 POTENTIAL EFFECTS ACCIDENTS OR MALFUNCTIONS

The potential effects to the environment in the event of an accident or malfunction causing a spill during transport, storage, or use of fuel are outlined in Table 7.6-1. Sabina's objective is to avoid accidents or malfunctions through implementation of effective operating practices, and ensuring proper training of employees and contractors. In addition, Sabina will ensure the petroleum, oils, and lubricant products are transported, stored, handled, transferred, and used in compliance with appropriate legislation to minimize the risk of potential environmental effects. However, if an accident or malfunction should occur Sabina will implement the SCP (SD-17), Risk Management and Emergency Response Plan (SD-15), Hazardous Materials Management Plan (SD-13), OPEP (SD-18), and the Shipboard Oil Pollution Emergency Plan where appropriate.

Table 7.6-1. Potential Environmental Effects of Fuel Product Spill to Environment

Material	Class	Potential Impact
Diesel	3	Water and soil contamination
Gasoline	3	Water and soil contamination
Aviation fuel	3	Water and soil contamination
Propane	2.1	Low risk to water and soil with proper handling
Lubricating oils	Non-regulated	Water and soil contamination
Hydraulic fluids	Non-regulated	Low risk to water and soil with proper handling
Paint thinner	Not classified	Harmful to aquatic life with long lasting effect

A complete list of potential environmental effects of hazardous materials is presented in the Hazardous Materials Management Plan (SD-13).

8. Monitoring Program

Deliveries of fuel to the Project will be overseen by the operations department. Trained, on-site staff will be responsible for observing and documenting the bulk transfer of fuel.

Monitoring of fuel storage tanks on site will be conducted in accordance with the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003) and *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008).

Monitoring will be conducted by environmental coordinators and if needed operational staff trained in spill prevention and response. Environmental monitoring staff trained in sample collection will follow-up with operations staff and conduct periodic inspections of fuel storage and transfer facilities and take water samples when needed. Sampling will be conducted consistent with established protocol and the Quality Assurance/Quality Control Plan. Contact information for environmental monitors' supervisors will be provided in the Environmental Management and Protection Plan (SD-20).

Water pooling within the secondary containment of the fuel storage facilities will be sampled, treated as necessary, and released to the receiving environment once water quality criteria has been met (Table 8-1).

Table 8-1. Proposed Bulk Fuel Storage Pooling Water Discharge Criteria

Parameter	Maximum Average Concentration (mg/L)
Benzene	0.370
Ethyl benzene	0.090
Toluene	0.002
Xylene	0.300
Lead	0.200
Oil and Grease	15 and no visible sheen

Notes:

The concentrations for Benzene, Ethyl benzene, Toluene, Xylene, and Lead are Freshwater CCME Guidelines for the Protection of Aquatic Life (CCME 2013).

The concentration for Oil and Grease is included in CCME (2003).

Water that meets discharge criteria, will be discharged to the terrestrial environment at a minimum setback of 31 m from all water bodies. The water discharge locations from fuel storage area secondary containment structures will be at the South and East sides of the Goose Fuel Storage Area containment structure and at each of the four sides of the MLA Fuel Storage Area containment structure. Discharges may vary year to year depending on operating conditions and the receiving environment. Sabina will not discharge any water from any fuel storage area directly to the aquatic receiving environment. Sabina may choose to direct the fuel storage area contact water to the active tailings facility.

The Type A Water Licence will confirm the monitoring stations and effluent discharge criteria to protect the receiving environment from discharges from any secondary containment fuel storage facility.

9. Mitigation and Adaptive Management

9.1 SPILL PREVENTION AND RESPONSE

Spill prevention will be achieved through training, best practices, adherence to operating procedures, inspections and adequately designed storage and transfer facilities. Further details of spill prevention measures are provided in the OPEP (SD-18), the SCP (SD-17), and Section 7 of this plan.

Spill response procedures, equipment, and organizations are based on a work and activity scope level assessment of potential spill risk. Sabina's comprehensive SCP (SD-17) and OPEP (SD-18) outline Sabina's plan for responding to hydrocarbon or other contaminant spill incidents that may occur at the Project.

In the event of a spill in the marine environment at the MLA the OPEP (SD-18) will apply. In the event of a spill at the Goose Property, MLA, or along the WIR, the SCP (SD-17) will apply. General spill prevention and response measures specific to fuel management are provided in Table 9.1-1.

Table 9.1-1. Spill Prevention and Response

Topic / Activity	Mitigation Measures
Spill Response Equipment (further detailed in Oil Pollution Emergency Plan and Spill Contingency Plan)	<ul style="list-style-type: none"> Spill kits appropriate for the hydrocarbon products being handled or transported will be positioned at refuelling areas. At a minimum, each kit will contain: <ul style="list-style-type: none"> Sufficient hydrophobic absorbent material (e.g., oil absorbent booms and sorbent pads) to contain and cleanup potential drips, leaks or spills. Gloves and heavy plastic bags to contain oily absorbent materials and contaminated soils or wastes. Spill kits will be inspected daily to ensure sufficient materials are available. Containment booms, linkable oil absorbent booms, and floating oil absorbent pads will be stored on-site to manage any releases to water. Reserve spill response equipment such as booms, socks, and pads will be available for response to larger spill incidents, and/or to replenish materials used in the smaller equipment spill kits. Sabina will ensure that relevant personnel are responsible for maintaining or providing necessary spill response equipment in their area. Sabina will ensure secondary spill response teams are in place and capable of effecting containment, remediation, communication, and reporting.
Spill Response (further detailed in Oil Pollution Emergency Plan and Spill Contingency Plan)	<ul style="list-style-type: none"> In the event a spill does occur, the following immediate actions will be taken by the responder (as is safe): <ul style="list-style-type: none"> Identify source. Stop release if safe to do so. Contain spill to minimize impacts. Notify the supervisor immediately. Clean up in a manner appropriate to the spill, removing contaminated soil and snow. Used spill kit materials will be disposed of in designated hazardous waste areas. Spill kits will be restocked after use.
Spill Reporting	<ul style="list-style-type: none"> All spills will be reported to appropriate personnel per the procedures defined in Sabina's SCP (SD-17).

9.2 ADAPTIVE MANAGEMENT

As Project development occurs, site experience may necessitate the need to update certain components of the Plan. Sabina will review the Plan on a regular basis to identify those components that require updating.

Formal evaluations of the Plan will be documented, deficiencies noted, and progress in addressing deficiencies tracked in writing. Responsibilities to address deficiencies and accountabilities will be assigned and deadlines for addressing required changes will be established.

The Plan is part of a continually evolving process that relies not only on the efficacy of data collection and analytical results, but is also dependent on feedback from the communities, government, Aboriginal groups, and the public. Having an adaptive and flexible program allows for appropriate and necessary changes to the design of monitoring studies, and the mitigation and monitoring plans. Some changes may come about through the observation of unanticipated effects or inadequacies in the sampling methods to detect measurable effects. Other changes may result from ecological knowledge acquired through working with Aboriginal community members and discussions with Elders, both in the field and through workshops.

Sabina is committed to considering and incorporating Traditional Knowledge into the Plan. The incorporation of Traditional Knowledge will occur throughout all stages of the Plan, including identification of mitigation measures, monitoring study design, data collection, and follow-up programs to obtain feedback.

10. Record Keeping and Environmental Reporting

Records will be kept under the supervision of designated Sabina personnel at each Project site for reconciled bulk fuel inventory, weekly use summaries, weekly reconciliation for each storage tank, overfill alarm tests, pressure tests (if applicable), inspections and maintenance checks, any alteration to the system, reports of leaks or losses, reports of spill responses, and records of training.

A record will document all significant changes that have been incorporated in the FMP subsequent to the latest annual review. The record will include the names of the persons who made and approved the change, as well as the date of the approval.

Spill reporting will be conducted in accordance with Sabina's comprehensive SCP (SD-17) and also included as a component of the Project Risk Management and Emergency Response Plan (SD-15).

11. Reclamation and Closure

The closure of Project, including fuel storage and associated infrastructure, is described in detail in the Interim Closure and Reclamation Plan. In general, steps will include:

- Fuel tanks will be steam cleaned, cut up, and landfilled. The rinse water will be treated before disposal;
- Concrete structures and rebar will be cut to grade, or infilled, and levelled;
- Developed areas will be re-graded to reduce the erosion potential;
- Fuel storage areas will be tested for hydrocarbon contaminated and soils remediated appropriately; and
- Excess fuel will be used, incinerated, or removed.

12. References

- CCME (Canadian Council of Ministers of the Environment). 2003. *Environmental Code of Practice for Above Ground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products*.
- CCME. 2013. *Canadian Environmental Quality Guidelines Summary Table*. Retrieved from: <http://sts.ccme.ca/>
- NIRB (Nunavut Impact Review Board). 2013. *Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River Project*. NIRB File No. 12MN036).
- NWB (Nunavut Water Board). 2010a. Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3). February 2010.
- NWB. 2010b. Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, flood control, diversions, and flow alterations) (M1). February 2010.