trash pump to a greywater disposal pit located about 110 m from local waterway with an automatic, float-controlled pump. This procedure will continue during the 2015 Site Preparation Activities.

- Scrap metal – will be separated, sorted and stored until backhaul available to Yellowknife and included in scrap metal recycling program. This includes principally empty 205 L fuel drums that will be stacked and stored in secondary containment; this also includes some construction waste and equipment parts.

Note that backhaul quantities will be tracked and recorded by camp management to include the type and volume of waste backhauled and note of final destination. Combustible material will be tracked as identified under "incineration management".

5.2 Hazardous Waste

Hazardous materials management is further outlined in the Hazardous Materials Management Plan.

5.3 Contact Water Management

Contact water is associated with construction activities and fuel storage areas. It is usually non-hazardous waste, however, may be classified as hazardous under water license terms and conditions.

Contact waters associated with general construction activities may become sediment laden and will be managed through the use of sediment fans and retention areas. Sediment laden water will not be directly discharged to nearby waterbodies.

The proposed management of liquid that may have collected in secondary containment of fuel storage areas includes:

- This water will be transferred out of each containment once the depth of water is equal, or greater, than 10 cm and pass through an oil/water separator;
- Following treatment, the water will be contained within a dedicated berm/tank system and tested for compliance with current water license thresholds; and
- If in compliance with current thresholds, it is released to the environment. If non-compliant, additional treatment will be implemented or the water will be drummed and shipped off site for disposal.

5.4 Waste Quantities

The following quantities of waste are estimated to be generated during the 2015 Site Preparation activities. Additional wastes generated by camp activities and incinerator use are managed under the existing Exploration Waste Management Plan and therefore are not listed below. Ongoing activities, as described in Section 0, and associated waste generation are included in Sabina's existing authorizations and approvals.

Waste Type	Quantity (m^3)
General debris	11
Plastics	0.1
Incinerator ash	12.3
Scrap metal	18
Oil/fuel filters	0.5
Hydrocarbon contaminated soil	2.9
Hydrocarbon contaminated water	5.8
Rags and absorbents	2
Waste oil	2.4
Recyclables	0.1
Petroleum grease	0.05

6. WASTE MANAGEMENT INFRASTRUCTURE

During the 2015 Site Preparation activities non-hazardous combustible waste will be burnt in the incinerator system at Goose Camp which is a Westland Environmental Services ltd. model CY-2020 unit installed in 2010. It is a diesel-fired, two stage, dual chambered controlled air batch incinerator contained within its own building on site. The capacity of the incinerator, based on typical mixed camp waste, is about 200 lbs indicating that 2 to 4 cycles can be processed on a daily basis to incinerate the camp waste.

All other wastes will be temporarily stored on-site before being back-hauled for disposal or recycling at an appropriate off-site facility.

6.1 Incinerator Guidelines

- Be sure to wear proper PPE including gloves, goggles, dust mask and face shield before handling waste or incinerator ash;
- Separate waste into what can be burned, and what cannot be burned at the source (e.g. kitchen);
- Burn food wastes daily to avoid accumulation of garbage (minimizes wildlife attractant). The operation of the incinerator will be recorded on a daily basis;
- Make sure the ash is cleaned out prior to recharging for the next burn cycle;
- Once cooled the incinerator can be opened and the ash placed in an empty drum which will be sealed, labeled and properly stored for backhaul and disposal in approved landfill. The weight of ash for backhaul will be recorded.
- Waste to be added to the incinerator should be monitored recording type of waste and weight. Note that Pacto toilet waste should make up 1/5 of each batch;
- When the incinerator is charged with the appropriate mix and quantity of waste, the door should be closed, ensure it is locked and the burn cycle started;

- When satisfied that the burn is proceeding in a controlled manned, the incinerator operator may leave the area while the equipment completes the burn cycle;
- Do not add waste to the incinerator once started;
- Do not use waste oil or any hydrocarbon as an accelerant; and
- Keep the area around the incinerator tidy.

Items that cannot be burned include:

- Styrofoam;
- Wood treated with preservatives; and
- Metal.

6.2 Temporary Waste Storage Facilities

Non-Hazardous Waste Storage

Combustible wastes will be temporarily stored in dedicated bins in proximity to incinerator until they are to be incinerated.

Recyclable non-hazardous, non-combustible waste will be temporarily stored in dedicated waste storage facilities located at Goose Camp before being back-hauled. Specific waste storage locations have not been identified at this time. Material will be safely stored until it is transported to an appropriate recycling or disposal facility. Waste storage locations will have both indoor and outdoor storage, and waste will be segregated according to its susceptibility to exposure to the elements.

Recyclable beverage containers will be stored inside to avoid attracting animals. The majority of other items will be stored in the laydown yard outdoors, and in shipping containers where appropriate. This includes recyclables such as tires, electronics and electrical materials, and scrap metal.

Hazardous Waste Storage

Hazardous waste will be temporarily stored on site in designated storage areas. All hazardous materials will be packaged for shipment to certified southern waste management facilities located in a provincial jurisdiction for subsequent treatment, recycling and/or disposal.

The management and handling of hazardous waste is outlined in detail in the HMMP.

7. TRAINING REQUIREMENTS

As part of their orientation, all on-site personnel will receive basic environmental and waste management training, including:

- Reducing water use;
- Managing food wastes to minimize wildlife attraction;
- Reducing waste; and
- Separating waste (recyclables, dry-cell batteries, food waste, and hazardous waste in colour coded and labeled storage containers).

This training will be key to ensuring that wastes are properly segregated and disposed. This is particularly important for wastes to be burned in the incinerator.

Adequate training is an important component of successful operation of the incinerator. Westland Services, the incinerator manufacturer, provides on-site training to Sabina personnel including incinerator maintenance. Camp management will track who completes this training and any refresher courses completed. Management will also record all preventative maintenance activities undertaken on the equipment.

8. REVIEW OF WASTE MANAGEMENT PLAN

The activities and costing of waste management activities will be reviewed internally on an annual basis relative to the long-term exploration strategy for the Project and operational needs.

APPENDIX E
HAZARDOUS MATERIALS MANAGEMENT PLAN

Hazardous Materials Management Plan

2015 Site Preparation Activities

October 2014

Table of Contents

1. INTRODUCTION AND BACKGROUND

1.1. Purpose and Scope

The purpose of this Hazardous Materials Management Plan (HMMP) is to provide a consolidated source of information on the safe and environmentally sound transportation, storage, and handling of hazardous products to be used during the 2015 Site Preparation activities at the Back River Project.

A hazardous material is one that, as a result of its physical, chemical, or other properties, poses a hazard to human health or the environment when it is improperly handled, used, stored, disposed of, or otherwise managed. In combination with Sabina's Spill Contingency and Emergency Response Plan (SCERP), this HMMP provides instruction on the prevention, detection, containment, response, and mitigation of accidents that could result from the handling of hazardous materials.

The HMMP is based on the following principles of management for hazardous materials:

- Identify and prepare materials and waste inventories;
- Allocate clear responsibility for managing hazardous materials;
- Describe methods for transport, storage, handling, and use;
- Identify means of long-term storage and disposal;
- Prepare contingency and emergency response plans;
- Ensure training for management, workers, and contractors whose responsibilities include handling hazardous materials; and
- Maintain and review records of hazardous material consumption and incidents in order to anticipate and avoid impacts on personal health and the environment.

All hazardous materials to be used at Sabina's operation will be manufactured, delivered, stored, and handled in compliance with all applicable federal and territorial regulations. Sabina is committed to preventing, to the greatest extent possible, both inadvertent release of these substances to the environment and accidents resulting from mishandling or mishap. Sabina has instituted programs for employee training, facility inspection, periodic drills to test systems, and procedural review to address deficiencies, accountability, and continuous improvement objectives.

Sabina actively works towards minimizing the generation of hazardous wastes by investigating alternatives to the use of hazardous materials, by recycling products and containers wherever feasible, and by treating wastes using state-of-the-art technologies before any release to the environment.

As with all other aspects of health and safety policy at the Back River Project, all employees will be expected to comply with all applicable precautions and handling procedures with regard to hazardous materials. Employees are also expected to report any concerns to their supervisors, the Occupational Health & Safety Committee (OH&SC), or senior site management. All staff are encouraged to bring

forward suggestions for improvements that can be incorporated into procedure revisions as appropriate.

1.2. Sabina Social and Environmental Policy

Sabina is committed to environmentally responsible and socially acceptable exploration and mining practices. We are dedicated to creating and maintaining a safe environment for both the land we occupy and the people that drive its success. The company's philosophy is to conduct its operations to protect not only the environment, but the health and safety of its employees and the public as well.

Sabina also subscribes to the principles of sustainable development in mining. While exploration and mining cannot occur without an impact on the surrounding natural environment and communities, our responsibility is to limit negative environmental and social effects and to enhance positive effects.

To achieve these goals, Sabina is committed to:

- Seeking to be environmental leaders in the mining community by integrating responsible environmental management as an essential component of all business decisions;
- Comply with all applicable laws, regulations and standards; uphold the spirit of the law and where laws do not adequately protect the environment, apply standards that minimize any adverse environmental effects resulting from its operations;
- Communicate openly with employees, the regulatory community and the public on environmental issues and address concerns pertaining to potential hazards and impacts;
- Assess the potential effects of operations and integrate protective measures into the planning process to prevent or reduce impacts to the environment and on public health and safety;
- Take appropriate corrective actions should unexpected environmental impacts occur. This will also include taking appropriate action to prevent reoccurrence of these impacts.
- Provide adequate resources, personnel and training so that all employees are aware of and able to support implementation of the environmental and social policy;
- Conduct and support research and programs that improve understanding of the local environment, conserve resources, minimize waste, improve processes, and protect the environment.
- Working with the appropriate local regulators and agencies, maximize benefits to the affected communities and residents;
- Balance all decisions with best management practices, scientific principles and traditional knowledge.

1.3. Applicable Legislation

Both federal and territorial legislation regulate the management of hazardous materials in Nunavut. Copies of relevant legal documents will be kept on file at the Project. Sabina will regularly update the HMMP with respect to applicable legislation, and ensure that current legislation documents are available at the site.

The *Transportation of Dangerous Goods Act* (TDGA) classifies hazardous materials into nine main classes according to an internationally recognized system, as follows:

- Class 1 – Explosives;
- Class 2 – Gases;
- Class 3 – Flammable liquids;
- Class 4 – Flammable solids;
- Class 5 – Oxidizing substances and organic products;
- Class 6 – Poisonous (toxic) and infectious substances;
- Class 7 – Nuclear substances, within the meaning of the Nuclear Safety and Control Act, which are radioactive;
- Class 8 – Corrosives; and
- Class 9 – Miscellaneous products or substances.

The classes of hazardous materials relevant to the 2015 Site Preparation activities are classes 1-4. Management and safety personnel will provide training relating to the TDGA and relevant classes, in addition to an overview of the applicable regulations, to all employees as part of their initiation and ongoing training.

2. ONGOING AND PROPOSED SITE PREPARATION ACTIVITIES

Activities planned for 2015 are divided into two groups, ongoing activities and proposed activities. The following sections describe each group.

Ongoing activities include:

- Goose Camp operations;
- Exploration and support activities; and
- Ice-based airstrip.

Proposed site preparation activities include:

- Ice road and associated water use;
- All-weather airstrip extension;
- Rascal Lake outflow stream realignment;
- Construction and use of a 6km all –weather road and associated crossings; and
- Quarry development and operation; and
- Staging of a Temporary Laydown Area (TLA) at the site of the proposed MLA.

2.1. Description of Ongoing Activities

Goose Exploration Camp

During site preparation activities for the Back River Property, it is anticipated that the existing Goose Exploration Camp (Goose Camp) will be used for ongoing exploration, engineering and baseline studies, and other site preparation activities.

Operation of Goose Camp

The Goose Camp will be utilized as a base for the aforementioned activities. No changes to the current camp accommodations are proposed.

Resupply of Goose Camp

The resupply of the Goose Camp and associated activities will take place utilizing all-weather and/or ice-based airstrips. No changes to the current resupply methodology are proposed.

Diesel Fuel Resupply and Storage

Additional fuel may be required for the proposed site preparation activities; this fuel will be supplied via aircraft and stored in the existing Goose Camp fuel storage area.

Arctic-grade diesel fuel will be used by motor vehicles and mining equipment on the site. Limited quantities of propane and gasoline will be used in maintenance facilities for smaller motorized equipment and machinery. All fuel to be used during the 2015 site preparation activities will be stored

within the existing 75,000 L tanks, within secondary containment. The Goose Camp fuel storage currently includes six 75,000 L tanks in tertiary containment and seven 75,000 L tanks that will require installation of a lined containment area, if used in 2015.

Explosives and Ammonium Nitrate Storage

Prepackaged explosives will continue to be delivered by air transport, sited and stored in accordance with legislative requirements and best management practices. Two magazines are currently located at Goose Camp; it is anticipated that additional magazines may be required.

Exploration and Study Support

Ongoing exploration and scientific studies to support the permitting and engineering phases will continue onsite. These may include geological mapping, drilling, geophysics, environmental baseline studies, and engineering studies. These activities, although based out of Goose Camp, may occur over the entire Project area.

Ice-based Airstrip

An ice-based airstrip on Goose Lake will be required for the delivery of equipment and materials necessary for site preparation activities. The ice-strip, which has been constructed in previous seasons on Goose Lake, will be built to Transportation Canada regulations and standards. No additional water use is currently anticipated for this activity.

2.2. Description of Proposed Site Preparation Activities

2.2.1 Goose Property

Ice Roads and Water Use

Ice roads, totalling approximately 6 km in length, will be required to connect and access the proposed quarries and explosives storage locations at the Goose Property. To support this work, water for construction will be necessary. It is estimated that 120 m3/day of water will be required to build and maintain this access during ice road operations. In the open water season, an estimated 70 m3/day of this total volume will be used for dust suppression and compaction of placed construction materials.

Quarries

A total estimated volume of 550,000 m^3 of quarried material will be required to complete the outlined site preparation activities. Two quarries have been identified for use: the existing quarry next to the airstrip and a new quarry located within the footprint of the future Umwelt open pit. Up to 550,000 m^3 of rock will be required to support site preparation activities, and this material will be extracted from one or both of these quarries. As such, Sabina is seeking approval to extract up to 550,000 m^3 of rock from each of the existing quarry and the proposed Umwelt quarry. The total volume of rock extracted from one or both quarries, however, will not exceed 550,000 m3.

Only geochemically and physically suitable material will be developed, and handled per current quarry management plans.

All-weather Airstrip Extension

The current airstrip will be extended to allow for servicing passenger and cargo aircraft. This airstrip will serve as the main air access to the Goose Property throughout the life of the Project. The all-weather airstrip will be designed to Transport Canada standard TP 312 Aerodrome Standards and Recommended Practices (2005). The airstrip will be approximately 1,524 m long and 45 m wide.

Rascal Lake Outflow Stream Realignment

One of the Rascal Lake outflows currently intersects the extended airstrip footprint. A realignment of the natural watercourse will be required to divert the water currently flowing from Rascal Lake directly to Goose Lake, to flow via Gander Pond to Goose Lake. This realignment will require the construction of two berms to divert 100% of the flow from Rascal Lake through Gander Pond to discharge into a nearby area of Goose Lake. Berm construction material will be sourced from an approved quarry source.

All-weather Road and Associated Water Crossings

The proposed road alignment at the Goose Property will be constructed as an all-weather road. This road alignment, totaling approximately 5 km in length, is required to access the existing rock quarry, the new Umwelt quarry, and the extended all-weather airstrip.

The all-weather road will be constructed with run-of-quarry rock placed directly onto the tundra to preserve the permafrost. A layer of graded surfacing material will be placed to provide a protective trafficking layer. Construction materials will consist of geochemically suitable rock sourced from the existing quarry and/or Umwelt quarry.

Stream flow through the road alignment will be conveyed using appropriately sized culverts.

2.2.2 Temporary Laydown Area

A TLA will be staged at the site of the future MLA location. Activities will include the offloading of two barges containing materials, equipment, and fuel for future use; these materials will be stored at the TLA. Explosives magazines will also be offloaded to the TLA and stored empty for 2015.

Arrival and offloading of the barges and staging of the TLA will occur in the open-water season of 2015 over a period of approximately 25 days. The barges will come from a western route, either from the Lower Mainland or from Hay River.

Material Storage and Access

An estimated laydown area of up to 1 ha will be required to store equipment, materials and fuel for future Project works. With the exception of large preassembly and modular equipment, materials arriving at the TLA will be housed in sea containers. The equipment and materials will be placed on dunnage or swamp mats to protect the permafrost.

The TLA will be accessed from the barge landing area using swamp mats provisionally placed directly onto the tundra to preserve the permafrost. Once the equipment and fuel are stored, the swamp mats along this corridor will be removed and transported offsite with the outgoing barges.

To facilitate these efforts, personnel (10-14 staff) will be shuttled on a daily basis from the Goose Camp to the TLA. Minimal temporary structures (e.g. tents) will be used at the TLA site; these may include a first aid room, lunch room, and restrooms (pactos). Food, water, and waste will be temporarily stored and removed periodically. Local measures will be implemented to minimize wildlife attraction to the TLA.

Diesel Fuel Supply and Storage

Sabina will require 600,000 L of diesel fuel for future site preparation; this fuel will be shipped to the MLA (via barge) and stored in land-based steel tanks at the TLA. The tertiary containment for fuel tanks will be Arctic-grade manufactured instaberms or similar product. These will be placed on a stable foundation of interlocking swamp mats that will remain for the duration of the facility.

The capacity of each berm will be 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. In calculating the volume, the footprint of the smaller tanks is subtracted. The above basis is consistent with the document entitled Design Rationale for Fuel Storage and Distribution Facilities published by the Department of Public Works of the Northwest Territories (GNWT 2006; refer to Section 4.6 of these guidelines). The design of these containment products will be based on Arctic installation and industry storage standards. Fuel transfer will incorporate hoses and pumps within tertiary containment. Transfer methodology is described in the attached Oil Pollution Emergency Plan (OPEP).

3. HAZARDOUS MATERIALS LIFE CYCLE MANAGEMENT

"Life cycle management" implies the assessment of a particular product over its entire life — from the time a material need is identified to the time the product is fully consumed or disposed of as waste. It covers product supply, transportation, storage, handling, recycling, and waste disposal. Sabina is committed to ensuring proper life cycle management of all products used at the site, including hazardous materials. Sabina and its contractors will deal only with reputable, certified suppliers, transporters, and expediters.

3.1. Delivery

All hazardous materials are delivered to site by commercial carriers in accordance with the requirements of the Canadian TDGA. Carriers are licensed and inspected as required by the Department of Transportation. All required permits, licences, and certificates of compliance are the responsibility of the carrier. All shipments are properly identified and labelled. Shipping papers are accessible and include information describing the substance, immediate health hazards, fire and explosion risks, immediate precautions, fire-fighting information, procedures for handling leaks or spills, first aid measures, and emergency response telephone numbers.

Each transportation company is required to develop a spill prevention, control, and countermeasures plan to address the materials they are importing. In the event of a release during transport, the commercial transportation company is responsible for first response and cleanup. Sabina intends to periodically verify the qualifications of transport companies, their personnel and the adequacy of their spill prevention, control and countermeasures plan.

An Oil Pollution Emergency Plan (OPEP) has been developed with respect to fuel delivery to the MLA via barge.

3.2. On-Site Handling

Once dangerous goods are received at the workplace, additional regulations apply. The federal Workplace Hazardous Materials Information System (WHMIS) calls for the proper labelling of products, the availability of product information in the form of Material Data Safety Sheets (MSDS), and employee education on how to identify and handle hazardous products. Sabina obtains each MSDS with all new product deliveries and keeps them current (i.e. no older than three years), and maintaining a system of hardcopy or electronic MSDS catalogue that is readily accessible by all employees.

All hazardous materials are stored in secured areas to prevent access by unauthorized personnel or tampering. All tanks used for the storage of diesel fuel have been installed in secondary containment areas sized to hold at least 100% of the volume of the largest tank, plus 10% of the aggregate capacity of all other containers or tanks. Additional guidelines for the storage of hazardous materials are provided in Section 2.3.2.

In support of pollution prevention, Sabina has established procedures for regularly monitoring storage containers and facilities. If deficient conditions are identified, appropriate corrective actions are taken and documented. Additional details for inspection of storage areas are provided in Section 8. Emergency response procedures for spilled chemical substances are provided in the SCERP and OPEP. These procedures outline the response to accidental spills or releases of hazardous materials to minimize health risks and environmental effects. Included are procedures for evacuating personnel, maintaining safety, cleanup and neutralization activities, emergency contacts, internal and external notifications to regulatory authorities, and incident documentation.

3.3. Wastes

On becoming wastes, materials are stored and/or disposed in accordance with specific government regulations and guidelines. Sabina stores most waste materials on site in secure facilities until they can be transported to other provincial jurisdictions for recycling or disposal.

The Department of Environment, Environment Protection Service (EPS) monitors the movement of hazardous waste, from the generator to final disposal, through use of a tracking document known as a Waste Manifest. Accordingly, a Waste Manifest accompanies movements of hazardous wastes for the Sabina Project. Sabina is registered with the EPS as a waste generator, and will employ only registered waste carriers to transport waste to registered/approved waste receivers. A copy of the completed manifest will be maintained for a period of two years after the hazardous waste is received by the authorized waste disposal facility.

3.4. Empty Product Containers

Many empty chemical containers are not safe to dispose of directly and require handling precautions identical to those for full containers. Chemical users must be familiar with safe waste handling and storage procedures supplied by manufacturers in MSDS. The containers are backhauled to Yellowknife for disposal at an approved facility.

4. HAZARDOUS MATERIALS MANAGEMENT

4.1. Types of Hazardous Materials

The typical types of hazardous materials that will be generated during the 2015 Site Preparation Activities include:

- Petroleum Products and Lubricants – diesel fuel, oils, greases, anti-freeze, and solvents used for equipment operation and maintenance; and
- Hazardous medical waste.

4.2. General Storage Guidelines

Sabina is committed to the safe and appropriate storage of fuels, hazardous materials and hazardous wastes. The following sections outline general guidelines for storing fuels, hazardous materials and hazardous wastes.]

Storage Drums/Containers

Hazardous materials/waste shall be stored in drums/containers according to the following guidelines:

- In the original containers, where possible, or in containers compatible with the material being stored to prevent corrosion or chemical interaction that could lead to leaks or fires;
- Storage containers shall be in good condition, sealable and not damaged or leaking;
- Drums containing hazardous materials/wastes expected to be in storage for more than six months shall be placed on pallets or on a well-drained storage area to prevent rusting;
- Each container shall be clearly labelled to identify the substance being stored according to the requirements of the WHMIS;
- Containers shall be kept closed except when adding or removing product;
- Containers with product shall be kept in the upright position; empty drums can be placed horizontally with a 3-9 configuration;
- Containers shall be arranged to prevent damage from falling or dislodging; and
- Containers shall be arranged to allow for easy access and inspections.

Storage Areas

To assist in the safe and secure storage of fuels, hazardous materials and hazardous wastes, the following general guidelines for storage areas/facilities are followed:

- Design of storage areas are in compliance with the National Fire Code, where appropriate;
- Compliance with the Canadian Council of Ministers of the Environment (CCME) publication, “Environmental Code of Good Practice for Above Ground Storage Tank Systems Containing Petroleum Products”. This CCME code deals with inventory control, inspections, corrosion protection, records and monitoring. Environment Canada’s Storage Tank Systems for Petroleum

Products and Allied Petroleum Products Regulations outline registration and documentation requirements for storage tanks.

- Storage areas have controlled access. Only authorized and trained personnel have access to storage areas;
- Storage areas are adequately signed indicating that hazardous materials/wastes are stored therein;
- Storage locations are clearly defined and marked to prevent damage of storage drums and containers in the event they are covered by snow;
- Incompatible materials are segregated by chemical compatibility within the storage area to prevent contact between materials in the event of a release;
- Storage areas are located at least 30 metres from surface water and on a low-permeability area;
- Storage areas are readily accessible for fire-fighting and other emergency procedures;
- Secondary containment is installed to allow for the containment of at least 110% of the largest container or tank volume within the contained area, plus 10% of the aggregate capacity of all other containers or tanks (CCME 1994);
- Storage areas are constructed, or provided with barriers, to protect containers from physical damage; and
- Adequate spill and emergency response equipment have been installed at each storage area (i.e. spill control, fire protection, etc.). A list of spill control equipment is provided in the SCERP.

4.3. Delivery, Storage and Disposal of Petroleum Products

Petroleum products will be transported, stored, handled and disposed of in accordance with appropriate legislation and best management practices.

With the exception of diesel fuel, most petroleum fuel and lubricant products will be delivered to site and stored in the original packing container from the manufacturer. These types of containers include a variety of sealed drums, pails, cans, and tubes.

All fuel transfer and storage facilities have been designed in accordance with the Canadian Council of Ministers for the Environment (CCME 1994) Environmental Code of Practice for Above Ground Storage Tank Systems Containing Petroleum Products, and the National Fire Code.

Appropriate measures are in place to minimize impacts to surface water, groundwater and soils from potential vehicle accidents when transporting hazardous materials to the site. Details of spill responses are presented in the SCERP.

Used oil that is no longer suitable for its intended use is classified as a hazardous waste. The discharge of used oil to the environment, including but not limited to landfills, sewers and water bodies, is prohibited.

Where possible, waste oil is used as fuel in waste oil burners to heat the Quonset huts. Otherwise, used oil products will be collected in tanks or drums marked “Waste Oil” and disposed of at an approved facility. Empty petroleum containers will be stored on site in a designated area and returned to the

supplier on backhauls. Oil filters will be punctured and/or crushed and drained of their contents for 24 hours prior to disposal.

4.4. Storage and Disposal of Hazardous Medical Waste

Hazardous medical waste that may be generated during the 2015 Site Preparation activities will be stored and disposed of in accordance with appropriate legislation and best management practices.

5. INVENTORY, INSPECTION AND RECORDS

A contract expediting company in Yellowknife will arrange all deliveries to the Back River Project and will include the hazardous materials discussed in this HMMP. The Operations Supervisor will have ultimate responsibility for supervising the receipt, inspection, and recording of all material inventories at site. The inventory control will reconcile total amounts received against amounts ordered.

Inventory control tracks and monitors use of these materials with a weekly inventory count and a monthly reconciliation. If any issues are noted during this tracking, it is reported to the Operations Supervisor.

5.1. PETROLEUM PRODUCTS

Inventory Management

Diesel fuel use will be metered automatically when it is pumped from the storage tanks. The metered volumes will be summarized weekly and reconciled against tank levels determined manually with a dipstick from the top of the tanks. Dip stick readings are taken every day and recorded.

Aviation fuel will be dispensed from drums as required under the supervision of aircraft personnel. Consumption and on-site volumes will be reconciled monthly.

Lubricants and other petroleum products will be inventoried weekly and monthly.

Inspection

The Operations Superintendent will coordinate for inspection of all fuel and lubricant storage areas. All inspections will be logged with the date and time of inspection, facility inspected, and name of the person making the inspection.

The condition of hazardous materials storage areas, containers, tanks, connectors and associated plumbing will be checked on a regular basis. Observations on their condition will be logged, dated and kept near the corresponding storage area. Drums/containers will be inspected for the presence and legibility of symbols, words or other marks identifying the contents, and signs of deterioration or damage such as corrosion, rust, leaks at seams or signs that the drum/container is under pressure such as bulging and swelling, spillage or discoloration on the top or sides of the drum/container. If leaks or deterioration is encountered it will be noted and addressed in a timely manner.

The hazardous materials area's secondary containment will be inspected and the condition of the secondary containment will be noted. Arrangements will be made for repairs if necessary.

Any accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage will be reported in writing to the Operations Supervisor. The report will note any remedial repairs that may be made, the date of any repairs, and the need for any follow-up inspection.

Records

Records pertaining to storage, use, and loss of fuels and lubricants are required by CCME and the Fire Marshal (under the National Fire Code). The following records will be prepared under the supervision of the Operations Superintendent:

- Reconciliation of bulk inventory from resupply logs;
- Weekly use summaries;
- Weekly reconciliation for each storage tank;
- Inspections and maintenance checks of the storage tank, piping, and delivery systems;
- Reports of leaks or losses;
- Reports of spill responses; and
- Records of training.

5.2. MISCELLANEOUS HAZARDOUS/TOXIC MATERIALS

Inventory Management

Adequate quantities of all hazardous chemicals will be reconciled against orders on receipt. The appropriate group responsible for the miscellaneous chemicals is responsible for reconciling the resupply inventory.

Inspection

During operations, the appropriate group responsible for storage and handling of the miscellaneous chemicals are to regularly inspect all areas where such hazardous materials are used and stored. Any problems will be noted and reported to the Operations Superintendent. The Operations Superintendent will be responsible for weekly or monthly inspections of miscellaneous hazardous materials and storage areas.

Records

The quantity of hazardous materials received, used, and in possession of personnel are recorded by Inventory Control. Everyone must comply with the environmental regulations.

6. TRAINING REQUIREMENTS

6.1. GENERAL

All staff and contractors will receive the following training:

- Site orientation and operations overview;
- WHMIS;
- MSDS; and
- Spill Contingency and Emergency Response.

Employees will receive additional training in mine safety as specified by the *Mine Health and Safety Act* and regulations. Sabina will ensure compliance with the training requirements specified in the Act and regulations.

A record of training received will be maintained.

6.2. PETROLEUM PRODUCTS HANDLERS

Personnel who handle petroleum products will be expected to be conversant with relevant MSDS information. As well, these personnel will be given training in the following:

- Transportation of dangerous goods (TDG);
- Sabina's fuel handling procedures;
- Spill response and cleanup procedures for petroleum (see the SCERP);
- Emergency response, especially firefighting procedures (see the SCERP);
- Equipment operations and PPE requirements; and
- Slinging and helicopter safety.

6.3. THIRD PARTY CONTRACTORS

It is expected that third party contractors receive adequate and comprehensive training to conduct their work tasks from their employer. Sabina intends to review the general qualifications of third party contractors prior to having them work at the site. In addition, the contractor companies may also be requested to confirm the qualifications of specific individuals that they may have working at the site.

Third party contractors working on the site will be expected to participate in, and complete a site specific health and safety training session. The training session is envisioned to be valid for a period of one year, after which time the contractor may be required to complete the training again, or attend a refresher. The training session will outline site specific hazardous and response procedures that they should be aware of in the course of conducting their work on site. The training session will cover hazardous materials management.

7. REVIEW OF THE PLAN

The HMMP is a living document which will be updated as required based on management reviews, incident investigations, and regulatory changes.

APPENDIX F
QUARRY MANAGEMENT PLAN

BACK RIVER PROJECT
QUARRY MANAGEMENT PLAN

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1. Introduction

Sabina Gold & Silver Corp. (Sabina) is actively developing the Back River Project (the Project) approximately 75 km south of Bathurst Inlet, in the Kitikmeot Region, Nunavut. The Project is currently under review with the Nunavut Impact Review Board (NIRB).

Sabina is planning to seek regulatory approval of a site preparation program to initiate early works for mine development at Back River in advance of completing the mine development environmental assessment. This program (referred to herein and elsewhere as the "Site Preparation Works" or SPW) will consist of the positioning of equipment, consumables and fuel at the Project sites, the quarrying of aggregate for construction, and the establishment of basic infrastructure such as an all-weather road and an extended airstrip at the Goose Property. The SPW is further described in the accompanying environmental screening document prepared by Tetra Tech EBA on behalf of Sabina.

A necessary component of the SPW is the development of rock quarries to support the above site preparation activities at the Goose Property. Two quarries have been identified for use: the existing quarry next to the airstrip and another new quarry located within the footprint of the future Umwelt open pit (Figure 1.1). Up to 550,000 m^3 of rock will be required to support SPW, and this material will be extracted from one or both of these quarries. As such, Sabina is seeking approval to extract up to 550,000 m^3 of rock from each of the existing airstrip quarry and the proposed Umwelt quarry. The total volume of rock extracted from one or both quarries, however, will not exceed 550,000 m^3.

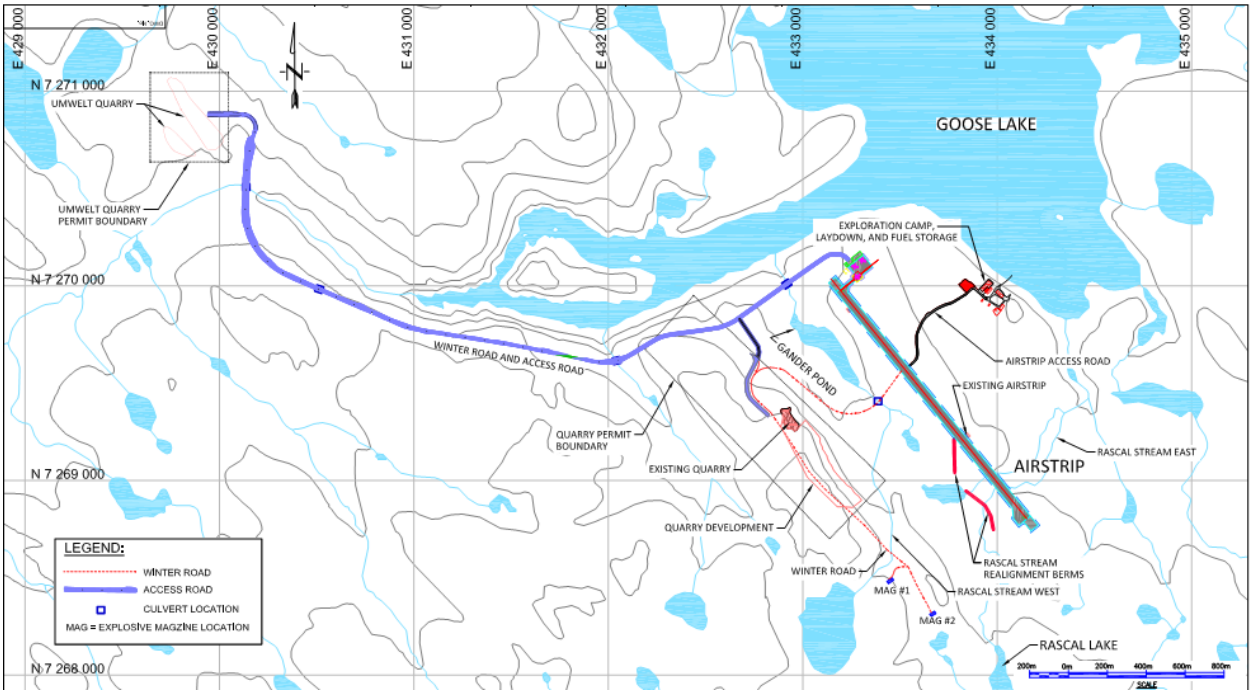
Sabina currently holds a Quarry Permit Agreement with the landowner, the Kitikmeot Inuit Association (KIA), for the existing airport quarry at the Goose Property ("Quarry A"). The existing quarry was also incorporated into Amendment 3 of the Type B Water Licence for the Goose Exploration Property (2BE-GOO1015). The coordinates of the existing and proposed quarries are presented in Table 1.1.

Table 1.1 Quarry Permit Coordinates

Aggregate Source	Permit	Material	Approved/Proposed Volume (m^3)	Approx. Surface Area (hectares)	Permit Area Boundaries
Quarry A	KTP11Q001	Rock	125,000/550,000	55	Point 1 E432188, N7269675 Point 2 E432438, N7269950 Point 3 E433425, N7269000 Point 4 E433138, N7268700
Umwelt	In application	Rock	0/550,000	4	Point 1 E429644, N7271096 Point 2 E430046, N7271096 Point 3 E430046, N7270637 Point 4 E429644, N7270637

An amendment will be sought for the Goose Property's Quarry A Quarry Permit Agreement, and a new agreement will be sought to develop a rock quarry at the Umwelt deposit.

Figure 1.1 Goose Property Layout for SPW



2. Scope and Objectives

This Quarry Management Plan (QMP) outlines Sabina conceptual plans to develop quarries in support of SPW in an environmentally sound manner. General mitigation measures that Sabina will apply to these and any other quarries or borrow areas are presented, along with development plans for the two quarries associated with the SPW. Specific mitigation measures are identified for the construction, operation and closure of each of the two quarries, and a monitoring program is prescribed.

The QMP addresses the following topics:

- Applicable legislation and guidelines
- Roles and responsibilities
- Environmental protection measures and proposed thresholds
- A monitoring program to collect water quality and quantity data during quarry operations
- Mitigation to avoid or minimize potential adverse effects on water quality and quantity during quarry operations identified through the monitoring program
- Checking and corrective actions
- Record keeping and environmental reporting
- A framework for the evaluation of plan effectiveness
- A Quality Assurance / Quality Control (QA/QC) program to be applied to the monitoring program

This QMP has been prepared to support permitting for site preparation work, the requirements under the Nunavut Water Board (NWB) water licence, and the Kitikmeot Inuit Association (KIA) land use permits. Subject to annual internal review and revision, the QMP will remain applicable throughout the duration of the SPW, or until a material change in the scope of the Project occurs.

Reference documents to support the SPW include:

- SPW Environmental Screening Document
- SPW Abandonment and Restoration Plan
- SPW Spill Contingency Plan
- Goose Exploration Camp Explosives Management Plan

The goal of any management plan is to reduce and prevent impacts to the environment while ensuring personnel safety and appropriate fiscal considerations during mineral exploration and project development activities.

3. Planning and Implementation

3.1 QUARRY A – EXISTING QUARRY

3.1.1 Consideration of Potential Environmental Effects

The existing quarry was previously subject to an environmental screening by NIRB. During that screening, Sabina considered the following:

- A setback of 31 m from watercourses and environmentally sensitive areas, including archaeological features;
- The quarry was assessed to contain adequate aggregate resources and would require minimal stockpiling of overburden;
- The quarry was low in ARD/ML potential (Rescan, 2011; see Section 6.1.1); and
- Extraction of rock from the quarry was not anticipated to meaningfully disrupt permafrost conditions.

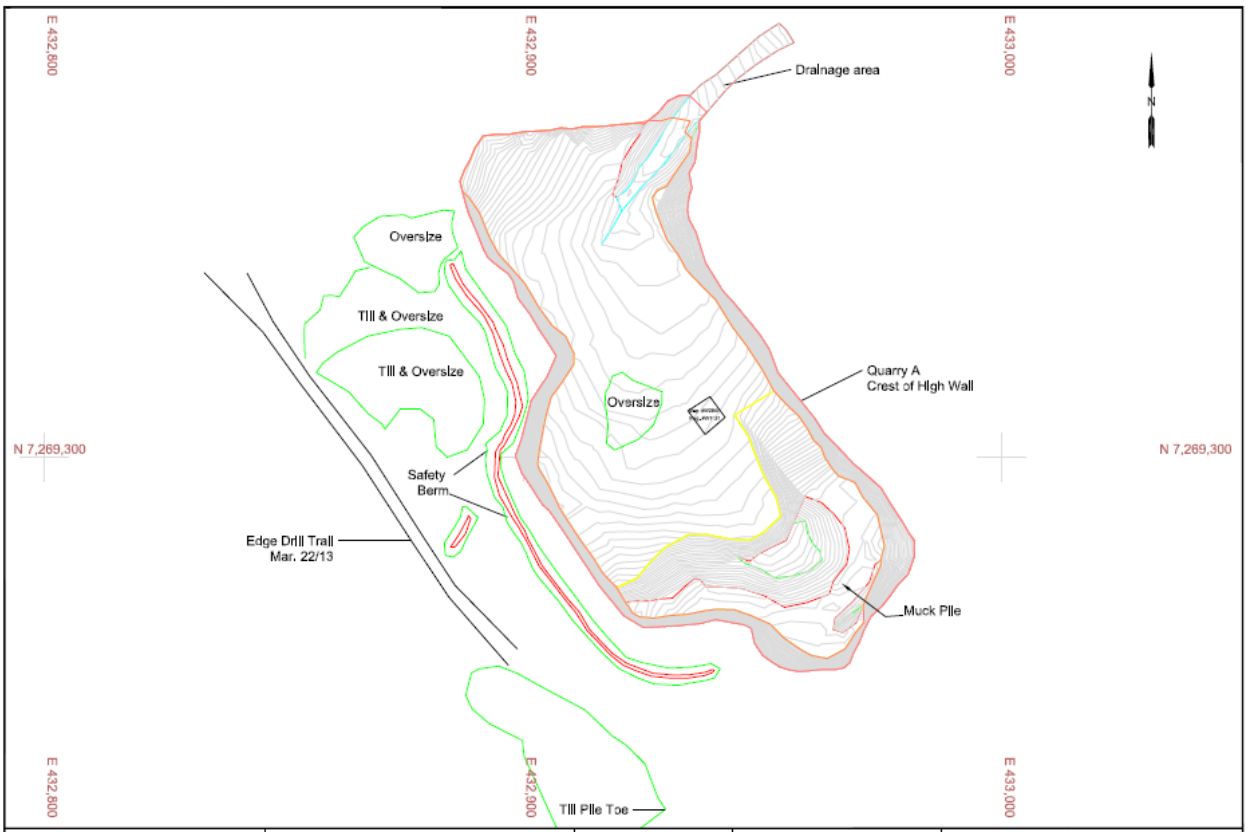
3.1.2 Previous Quarry Development

Sabina's current Quarry Permit Agreement KTP11Q001 allows for the quarrying of up to 125,000 cubic meters (m^3) of rock from Quarry A at the Goose Property. The Quarry A permit boundary is a rectangular area measuring 1,375 m by 400 m (~55 ha) as shown on Figure 1.1. The development of this quarry was incorporated into Amendment 3 of Type B Water Licence 2BE-GOO1015 for the Goose Exploration Property.

During the 2013 season (March 1 to May 15, 2013) approximately 40,000 m^3 of rock material was drilled and blasted at Quarry A. Run of Quarry (ROQ) material was trucked over winter road corridor from the quarry to crushing equipment located at the all-weather airstrip. The material was crushed to 4-inch and ¾ inch aggregate and was used to build a pad and containment for bulk fuel tanks in Goose camp and to surface the all-weather airstrip and connecting road between the airstrip and Goose camp.

Minor stockpiles of surface till and oversized ROQ remain. A survey of the quarry following completion of the 2013 extraction is shown as Figure 3.1.

Figure 3.1 Existing Quarry A after Extraction in 2013



3.1.3 Development Plan

As mentioned above, Sabina intends to extract up to 550,000 m^3 of rock to support the SPW program. Figure 3.2 shows the anticipated final Quarry A footprint based on the maximum extraction of 550,000 m^3 of rock.

Quarry A is located on a rock outcrop. Further development of the quarry will involve drilling and blasting as was undertaken in the previous phase. Quarry operations will use explosives and the design, shape, and size of the blasts shall be planned with safety being the most important consideration. A predetermined pattern of drillholes will be drilled to a depth not exceeding the overall depth of the quarry and filled with explosives. Prior to the blast, all personnel and equipment are moved to a safe distance. The blasted rock and fragments will be loaded into haul trucks using a loader, a hydraulic shovel, or similar means. The ROQ material will then be hauled to the construction area, dumped, and placed using a dozer ("drill, blast, load, haul, dump" sequence).

Some of the ROQ will be moved to a crusher to produce aggregate of various sizes. The crusher will be offset from local waterways and may be shielded from the prevailing wind. The shielding is best managed by placing the crusher within the quarry behind a high wall to reduce the quantity of windblown dust and enabling dust to fall within the quarry boundaries.

A highwall will be created along the high point in the ridge along the western extent of the proposed SPW quarry, and the quarry floor will be sloped to the east. A gentle slope to the quarry floor will ensure that the quarry is free-draining. The highwall may reach a height of 20 m in places, if the quarry is fully developed.

The existing quarry has minimal overburden. Any overburden generated and not used by the Project will be placed in stable stockpiles either above the highwall or along the toe of the quarry.

3.1.4 Water Management

As mentioned above, the quarry will be developed to be free draining. As such, runoff from the quarry will drain to the lower lying area to the east, eventually reporting to the stream that connects to Gander Pond. Runoff, if present, will be sampled and compared to the quarry runoff criteria presented in Section 7.1.

3.1.5 Abandonment and Restoration

The design of the quarry incorporates closure considerations. Sloping of the quarry floor will prevent the ponding of water. A safety berm was established along the highwall during quarrying activities in 2013. This safety berm will be extended as required during quarry expansion as a progressive reclamation measure. At closure, any equipment, fuel and wastes will be removed. The quarry may be used for landfilling bulky, non-hazardous wastes at the conclusion of the program. In this instances, stockpiled rock and/or till overburden will be used to place a 1 m cover over landfilled materials. Remaining stockpiles will be inspected and re-contoured to ensure slopes are stable in the long term.