Back River Project

Comprehensive Quarry Management Plan

Revision 0

January, 2012

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1. INTRODUCTION

Sabina Gold & Silver Corp. (Sabina) is actively working in the Back River area under valid land use, mineral tenure and water permits. These include:

Table 1. List of licenses and permits applicable to the Back River Project.

Permit No.	Permit Name	Type	Expiry	Agency
N2011F0029	winter road Beechy Area	Class A	2013-12-13	AANDC
N2010F0017	Winter road Bathurst Inlet to Back River	Class A	2013-09-16	AANDC
N2009F0015	winter road Hackett to George	Class A	2013-02-28	AANDC
KTL304F049 - Amended	Winter road Bathurst Inlet to Goose Lake and George Lake	Level 3	2012-12-13 (ext pending)	KIA
KTL304F012	winter road Hackett to George	Level 3	2012-03-31 (ext pending)	KIA
N2010C0016	Back River Mineral Exploration	Class A	2013-10-31	AANDC
KTL304C017 -Amended	Goose Camp	Level 3	2012-12-13 (ext pending)	KIA
KTL204C012 - Amended	Boulder	Level 2	2012-12-13 (ext pending)	KIA
KTL304C018 - Amended	George Camp	Level 3	2012-12-13 (ext pending)	KIA
KTL204C020 - Amended	Boot	Level 2	2013-12-13 (ext pending)	KIA
KTP11Q001	Goose rock quarry agreeement		2013-12-13 (ext pending)	KIA
KTP12Q001	Goose aggregate/borrow quarry agreement		2013-12-13 (ext pending)	KIA
KTP12Q002	George aggregate/borrow quarry agreement		2013-12-13 (ext pending)	KIA
2BE-GEO1015	George Water	Type B	2015-06-15	NWB
2BE-GOO1015	Goose Water	Type B	2015-03-31	NWB

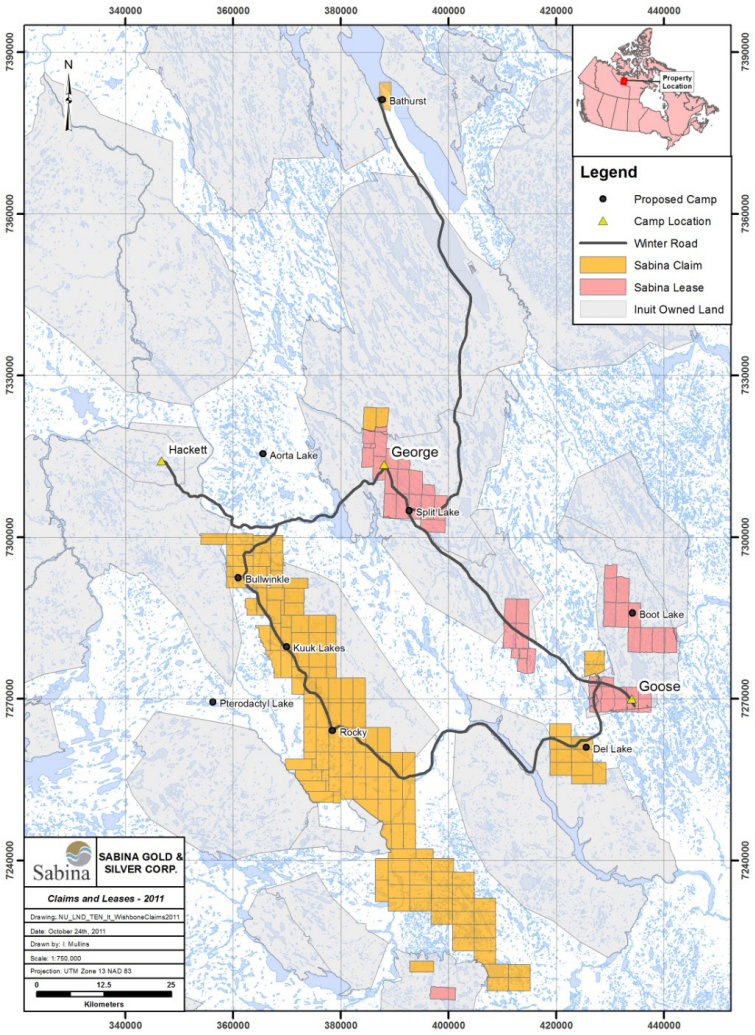
The Quarry Management Plan has been established to outline development, operation and closure of approved borrow and rock quarry areas within the Goose and George properties. The purpose of this Plan is to ensure sound management of borrow and quarry material, explosives and water in order to minimize the impacts to the local environment during the life of a quarry. Implementing best management practices and working responsibly will ensure the protection of the environment and personnel safety.

Sabina will implement this Quarry Management Plan and will continue to look for opportunities to minimize or eliminate negative impacts to the environment as a result of its activities, products and services at Sabina's Projects.

1.1. Existing Facilities

The Back River exploration project is located in western Nunavut, south of Bathurst Inlet within the Slave Structural Province. It lies approximately 525 kilometres northeast of Yellowknife, NWT and 400 kilometres south of Cambridge Bay, NU. The project area is within the zone of continuous permafrost, and is represented on National Topographic System 1:250,000 scale map sheets 76F, 76G, 76J, and 76K.

Figure 1. Location map of the Sabina's exploration properties within western Nunavut.



1.1.1. Goose Camp

The Goose camp is the primary camp for the Back River Project and is located on the slope of the western shore of Goose Lake (Figure 2). It has the capacity to support up to 120 people. The lakeshore is approximately 50 m toward the north and the regional topographical gradient surrounding the camp ranges from 2% to 6% towards the north. The camp is approximately 300 m in length from east to west and 100 m wide from north to south, covering an area of 30,000 m2. A small creek runs east northeast, east of the camp. The camp facilities are located on natural tundra underlain by a 10 cm organic layer overlying silt-sand parent material.

- Latitude: 65º 32'N, Longitude: 106º 25'W
- UTM Coordinates 569405 E, 7265007N on NTS Map Sheet 76G/09

Supplies and personnel access the site at Goose Lake via charter air carrier; there is currently no all-weather road access to the site at any point through the year. In the winter, an ice strip on Goose Lake is used and float-equipped aircraft are used in the summer time. During the breakup period wheel-equipped aircraft will use a small gravel strip located to the northwest of Goose Lake camp or a partially constructed strip located just west of the Goose Camp. All travel throughout the project area is accomplished using helicopters, including drill moves and drilling support. In the winter when there is sufficient snow cover to avoid damage to the tundra, local transport in the Goose Lake area is done with snowmobiles, and a Caterpillar D6 may be used for drill moves.

Figure 2. Areal imagery of Goose Lake Camp (Summer, 2012)

?inset map with quarry locations, access, magazine location?

1.1.2. George Camp

The George Lake camp is located on the western shore of George Lake (Figure 3) and consists of an approximate 30 people camp. These facilities are located on the eastern side of an esker which has been partially leveled for use as an airstrip. The lakeshore is approximately 60 m to the east of the camp buildings. A lined, bermed bulk fuel storage area is located approximately 100 m off the northwest end of the airstrip.

- Latitude: 65º 55'N, Longitude: 107º 25'W
- UTM coordinates: 613886 E, 7311032N on NTS Map Sheet 76 G/14

Supplies and personnel access the site at George Lake via charter air carrier; there is no all-weather road access to the site at any point through the year. In the winter, an ice strip on George Lake is used and float-equipped aircraft are used in the summer time. During the breakup period wheel-equipped aircraft will use the prepared esker strip at the George camp. All travel throughout the project area is accomplished using helicopters, including drill moves and drilling support. In the winter when there is sufficient snow cover to avoid damage to the tundra, local transport in the George Lake area is done with snowmobiles, and a Caterpillar D6 may be used for drill moves.

Figure 3. Aerial imagery of George Camp (Sept 2012)

?insert map with quarry locations?

1.1.3. Temporary Camps for Resupply and Exploration

Temporary camps for up to 20 people are established for a season in target areas located 20 km or more from the main camps and would be established for safety, environmental and economic reasons. Possible locations are included in Figure 1. The intent is not to establish a network of camps across the exploration area, but to have the opportunity and flexibility to establish these temporary camps as needed. All transportation to and around these camps would be similar to the current practices at Goose and George camps.

1.2. Proposed Borrow and Rock Quarry Facilities

The propose borrow and rock quarry locations will be located on Inuit Owned Lands, as authorized by the Kitikmeot Inuit Association (KIA) or on Crown Land, as authorized by Aboriginal Affairs and Northern Development (AANDC). Current quarry locations are located on Inuit Owned Lands, however, during the life of project there may potentially be numerous borrow and rock quarry activities. These will be determined and approved as needed but all will meet the requirements of this Plan.

1.3. Scope

This Quarry Management Plan has been prepared to meet requirements under the NWB license and applies to all Sabina activities in the Kitikmeot Region. Subject to annual internal review and revision, it will remain applicable throughout the duration of the NWB license, or until a material change in the scope of the Project occurs.

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 activities.

2. ROLES AND RESPONSABILITIES

2.1. All Employees

- Operation of borrow and rock quarry locations in line with this Plan and the respective Development Plans

2.2. Environmental Coordinator/Superintendent

- Support the Quarry Supervisor as required.
- Co-ordinate any inspections by applicable agencies.

2.3. Operations Manager/Site Superintendent

- Project oversight of borrow and rock quarries as per this Plan and the respective Development Plans.
- Assigning an individual(s) as Quarry Supervisor as part of their day to day activities.

2.4. Quarry Supervisor

- Ensures all staff working within the borrow or rock quarry area are instructed on this Plan and the respective Development Plans.
- With support from the Environmental Coordinator/Superintendent ensures all legal requirements are met.
- Conduct ongoing monitoring as required as per the terms and conditions of authorizations, this Plan and the respective Development Plans.
- Internally report as per the terms and conditions of authorizations, this Plan and the respective Development Plans.

3. POTENTIAL IMPACTS AND MITIGATION TECHNIQUES

The purpose of this Plan is to ensure sound management of borrow and rock quarry material, explosives and water in order to minimize the impacts to the environment during the life of a quarry. Implementing best management practices and working responsibly will ensure the protection of the environment and personnel safety.

In order to ensure the borrow or rock quarry is operated in a responsible manner the following must be considered for each rock quarry and will be considered in developing site specific Standard Operating Procedures.

Development Phase	Activities	Environmental Concerns	Possible Mitigation techniques
Site design and development	• vegetation clearing • Overburden removal	• Habitat loss • Soil erosion • Sediment deposition	• Minimize project footprint • Identify and avoid environmentally sensitive areas • Locate the development in a well- drained area • Maintain natural drainage patterns • Retain vegetation buffer zones to maintain slope stability and protect water bodies • Construct ditches to direct runoff away from the site • Salvage and properly store organics, topsoil and overburden for use during reclamation
Operations and monitoring	• Blasting • Excavating • Crushing • Piling material • Access road maintenance	• Soil erosion • Sediment deposition	• Limit sediment movement using erosion controls (e.g. silt fence) • Use rip-rap to reinforce drainage channel corners and water discharge points • Use settling ponds before discharging water • Revegetate and/or use riprap where required to stabilize slopes
		• Fuel spills • Blasting residue	• Use proper fuel containment and explosives-handling techniques
		• Permafrost degradation	• Limit pit or quarry depth to the active layer • Minimize in-pit water by directing surface water away from the site • Thaw ice-rich material at a location where meltwater will not re-enter the pit
		• Dust generation	• Use water and dust skirts on conveyors to minimize dust

* From AANDC (Formerly INAC) Northern Land Use Guidelines Access: Pits and Quarries (January, 2010)

4. DEVELOPMENT, OPERATION AND CLOSURE

The primary purpose of the borrow and rock quarries is to support development and operation of the all-weather airstrips, access roads and camp operations/enhancements at the Goose and George properties. The proposed borrow and rock quarry locations will be located on Inuit Owned Lands as authorized by the Kitikmeot Inuit Association (KIA) or on Crown Land as authorized by Aboriginal Affairs and Northern Development (AANDC) with associated water management authorized by the Nunavut Water Board. The proposed areas will be developed, inspected, maintained and closed by Sabina or contractors working under the direction of Sabina.

4.1. Development Plans – Rock Quarries

A detailed procedure will be prepared before the start of development for each rock quarry. Site development plans will augment this management plan with specific details. These development plans will include:

- Site layout and setup with the following provisions:
  - Minimum setback of 31m from environmentally sensitive areas;
  - Adequate room for all activities;
  - Estimates of the resources to be extracted;
  - Refueling station with appropriate containment (if required);
  - Confirmation of low ARD/ML potential;
  - Confirmation of archeology, vegetation and wildlife status;
  - Expected permafrost conditions;
  - Stockpiling location (if required);
  - Equipment lists;
  - Explosive magazine locations;
  - Dust and noise management;
  - Waste management facilities; and
  - Water management facilities.
- Related documents:
  - Blasting/Explosives plan;
  - Spills contingency plan;
  - Waste management plan;
  - Water management plan; and
  - Site specific operating procedures.
- Monitoring (Appendix A):
  - Water management and quality;
  - Pit wall stability;
  - Extent of permafrost or ground-ice;
  - Wildlife interactions or sightings; and

- Reclamation:
    - Overburden replacement for site grading and re-contouring;
    - Reclamation of natural drainage;
    - Slope reconstruction;
    - Removal of all garbage and debris;
    - Removal of all temporary storages/structures/equipment;
    - Reclamation of access road and block access (if required); and
    - Replacement of all salvaged topsoil (if required).

4.2. Development Plans – Borrow Areas

A detailed procedure will be prepared before the start of development for each borrow area. Site development plans will augment this management plan with specific details. These development plans will include:

- Site layout and setup with the following provisions:
    - Minimum setback of 31m from environmentally sensitive areas;
    - Adequate room for all activities;
    - Estimates of the resources to be extracted;
    - Refueling station with appropriate containment (if required);
    - Confirmation of archeology, vegetation and wildlife status;
    - Expected permafrost conditions;
    - Stockpiling location (if required);
    - Equipment lists;
    - Dust and noise consideration;
    - Waste management facilities; and
    - Water management facilities.
- Related documents:
    - Spills contingency plan;
    - Waste management plan;
    - Water management plan; and
    - Site specific operating procedures.
- Monitoring (Appendix A):
    - Water management and quality;
    - Extent of permafrost or ground-ice;
    - Wildlife interactions or sightings; and
    - Contingencies if changes to the original development scenario are required.
- Reclamation:
    - Overburden replacement for site grading and re-contouring;
    - Reclamation of natural drainage;
    - Slope reconstruction;

- Removal of all garbage and debris;
- Removal of all temporary storages/structures/equipment;
- Reclamation of access road and block access (if required); and
- Replacement of all salvaged topsoil (if required).

5. REVIEW OF THE QUARRY MANAGEMENT PLAN

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

APPENDIX A – GENERAL MONITORING REQUIREMENTS

Water Quality

There may be drainage from borrow and rock quarry areas. When there is noticeable flow out of a quarry, likely during spring melt, a water sample will be collected before this water enters a receiving water body. Standing water, unless it is to be discharged to the environment, will not be collected as it poses little risk to the receiving environment.

Water samples would be collected on a monthly basis over the open water period, late June to September inclusive. The parameters to be collected are similar to current terms and conditions of the water licence and include:

- Physical parameters – field pH and water temperature, lab pH, conductivity, major anions and cations, turbidity, TSS
- Total and Dissolved metals

The results will be compiled in camp and available during inspection and included in the NWB annual report.

Pit Wall Stability (Rock Quarries);

Daily visual monitoring of pit wall stability within active rock quarry areas will be completed and recorded. Inactive, but still open, areas will be visually monitored at least monthly between July and September and this monitoring will be recorded. Closed areas will be visually monitored once the year following closure (during the July to September period) and this monitoring will be recorded. Closed areas may require additional monitoring.

Permafrost and Ground Ice

Daily visual monitoring of permafrost and ground ice within active borrow and rock quarry areas will be completed and recorded. Inactive, but still open, areas will be visually monitored at least monthly between July and September and this monitoring will be recorded. Closed areas will be visually monitored once the year following closure (during the July to September period) and this monitoring will be recorded. Closed areas may require additional monitoring.

Wildlife

Wildlife monitoring will be incorporated into current wildlife tracking as per the terms and conditions of current land use permits. This includes a log of sightings that detail, wildlife observed and an estimate of numbers. The data would be compiled and available on-site during inspections.