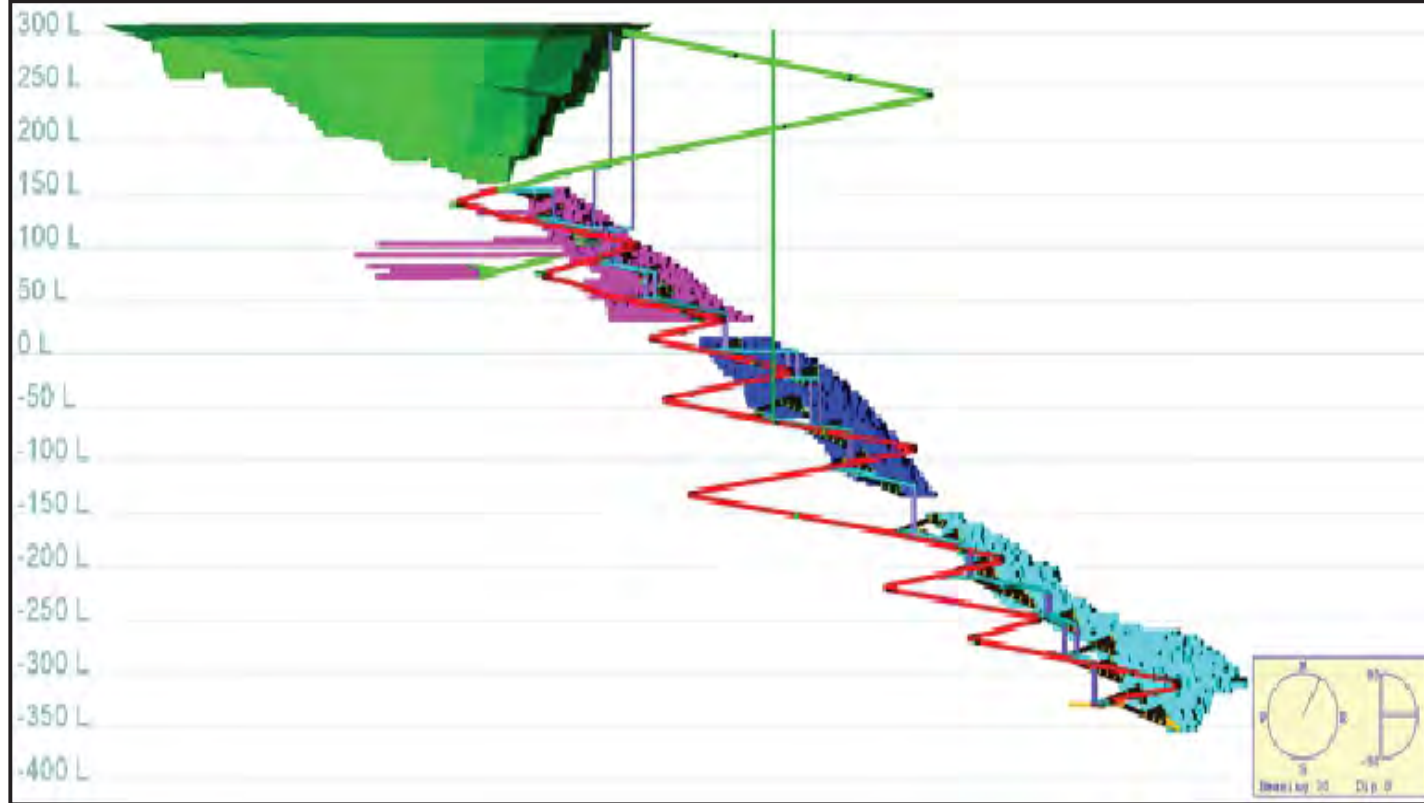
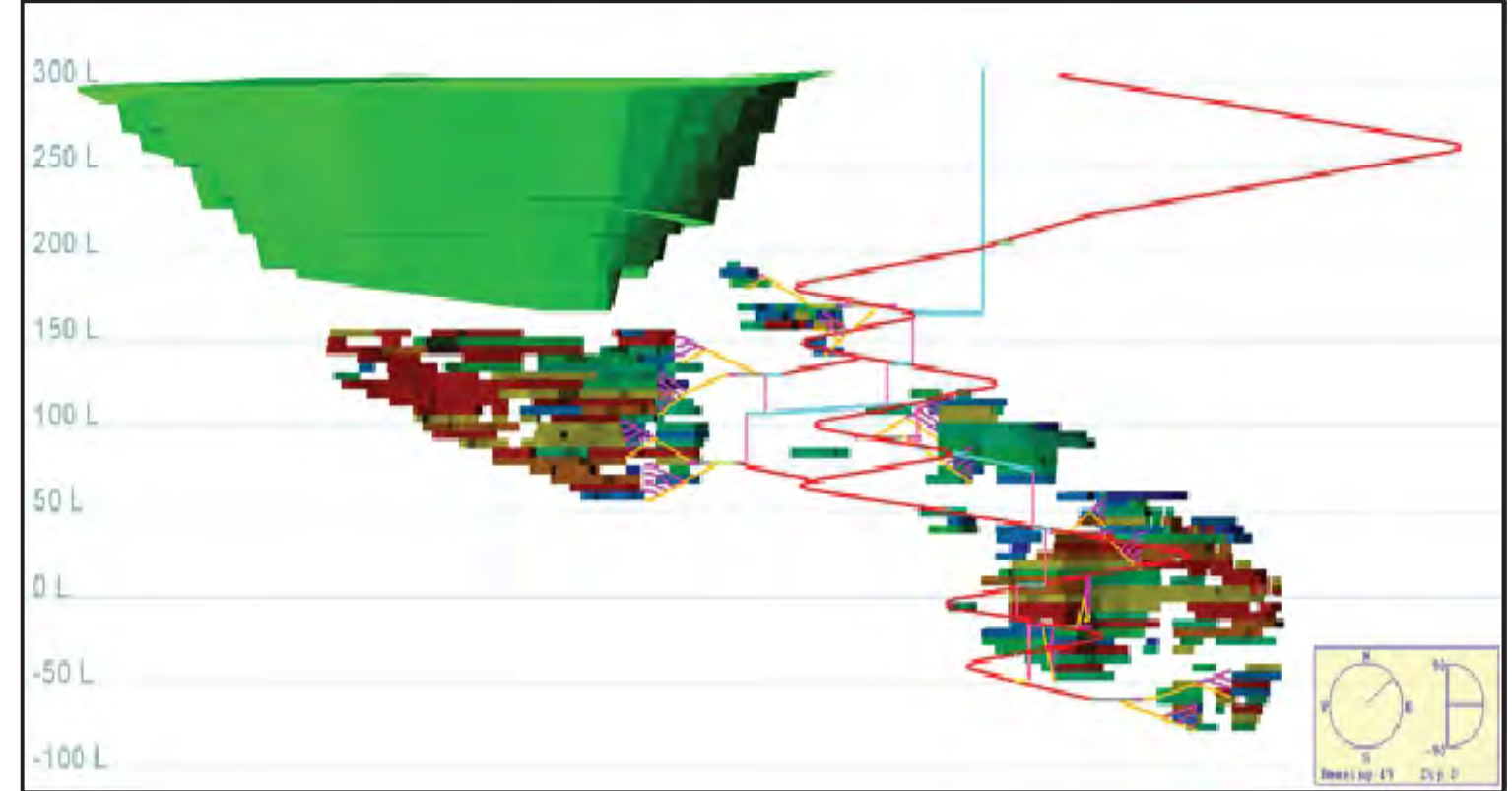




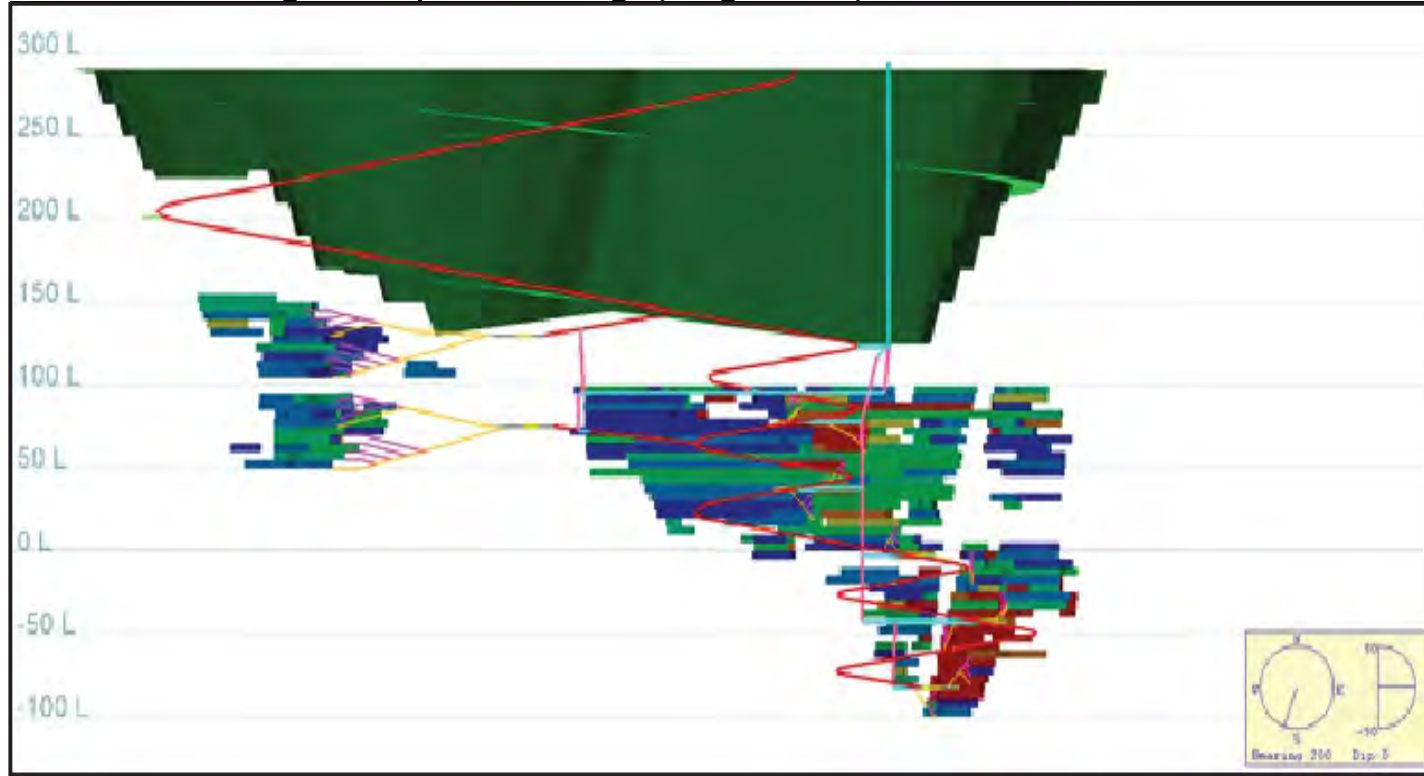
Umwelt Underground Operation Design (Long Section)



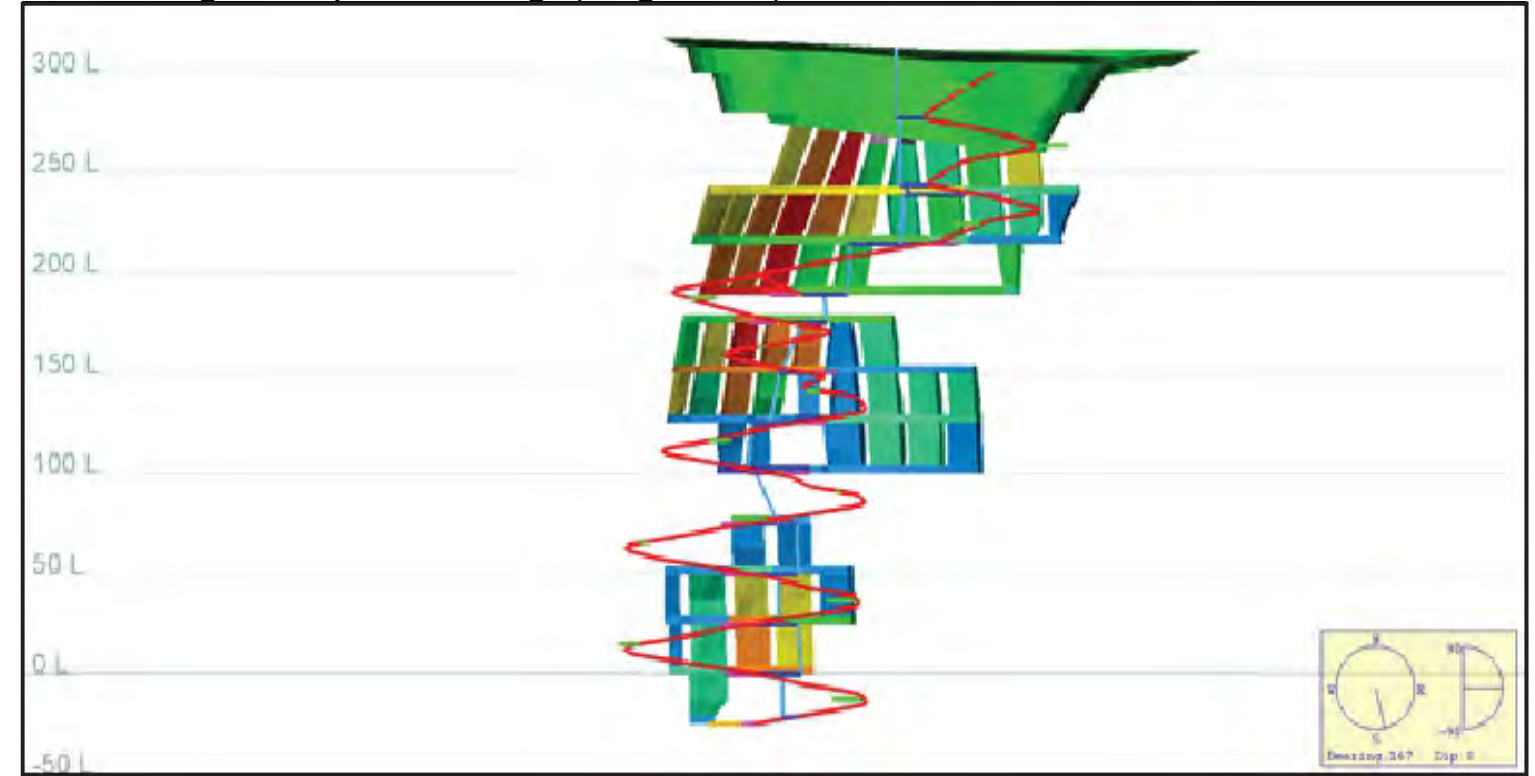
Llama Underground Operation Design (Long Section)



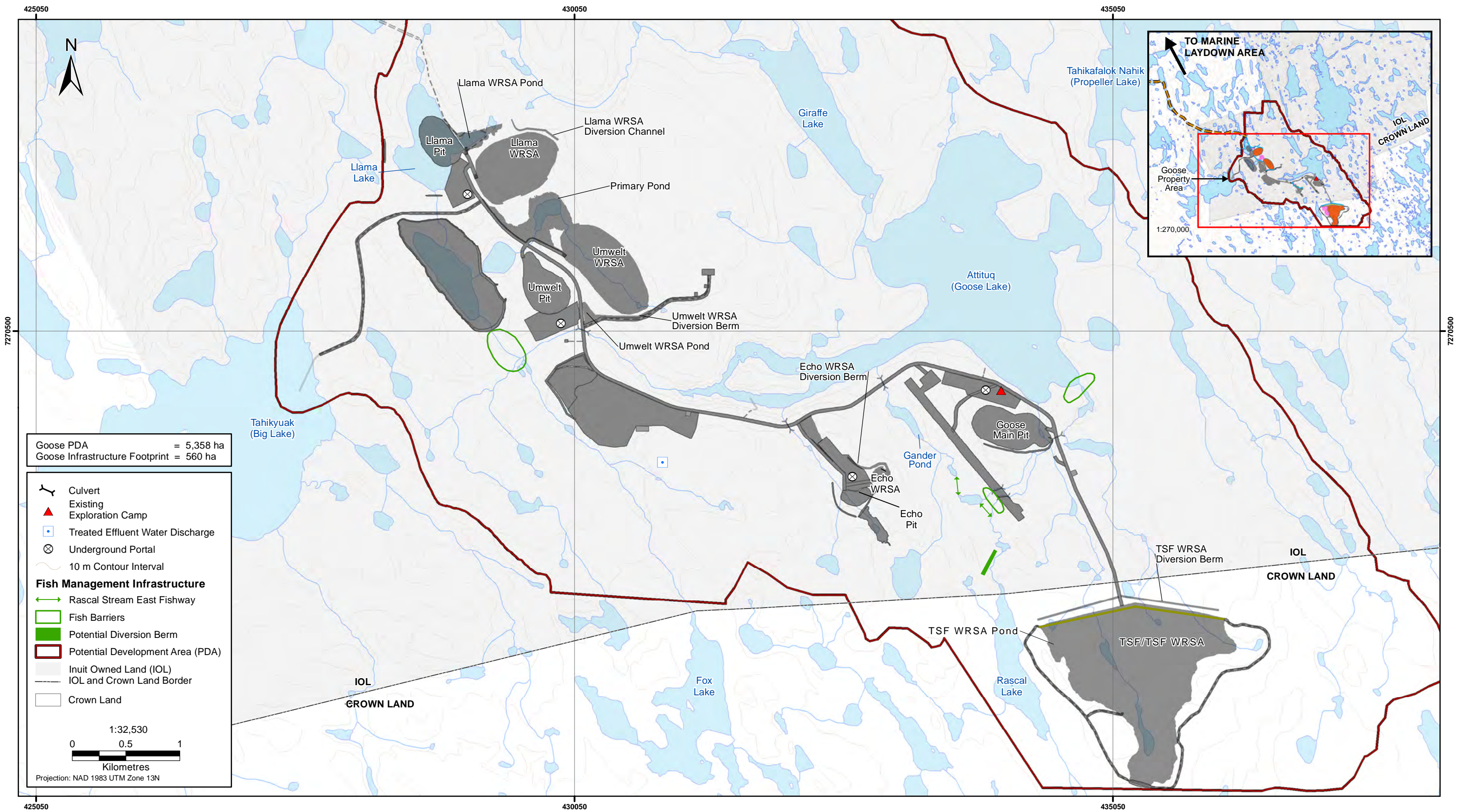
Goose Main Underground Operation Design (Long Section)



Echo Underground Operation Design (Long Section)



Source: JDS 2015



Appendix B. Tables

Table B-01. Primary Applicable Acts, Regulations, and Guidelines Applicable to Closure and Reclamation

Acts	Regulations	Guidelines
Federal		
<i>Canadian Environmental Protection Act (1999 c.33)</i>	<i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197)</i> <i>Environmental Emergency Regulations (SOR/2003-307)</i> <i>Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2002-301)</i> <i>Release and Environmental Emergency Notification Regulations (SOR/2011-90)</i>	<i>Canadian Council of the Ministers of Environment - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products</i> Notice with respect to substances in the National Pollutant Release Inventory Canada-Wide Standards for Particulate Matter (PM) and Ozone Canada-Wide Standards for Petroleum Hydrocarbons (PHC) In Soil
<i>Canada Wildlife Act (1985 w9)</i>		
<i>Species at Risk Act (2002 c.29)</i>		Species at Risk Policies
<i>Canadian Transportation Accident Investigation and Safety Board Act (S.C. 1989, c. 3)</i>	<i>Transportation Safety Board Regulations (SOR/92-446)</i>	
<i>Navigable Waters Protection Act (R.S. 1985 c. N-22)</i>	<i>Navigable Waters Works Regulations (C.R.C., c. 1232)</i> <i>Navigable Waters Bridges Regulations (C.R.C., c. 1231)</i>	
<i>Fisheries Act (R.S.C. c. F-14)</i> 35. (1) No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Projects that have the potential to obstruct fish passage, modify flow or result in the entrainment of fish may also cause serious harm to fish. In these situations, an authorization under Subsection 35(2) is required. Proponents are responsible for avoiding and mitigating serious harm to fish that are part of or support commercial, recreational or Aboriginal fisheries. When proponents are unable to completely avoid or mitigate serious harm to fish, their projects will normally require authorization under Subsection 35(2).	<i>Metal Mining Effluent Regulations (SOR/2002-2222)</i> <i>Marine Mammal Regulations (SOR/93-56)</i>	The Policy for the Management of Fish Habitat The Fisheries Protection Policy Statement, 2013 Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting
<i>Canada Labour Code (R.S.C., 1985, c. L-2)</i>	<i>Canada Labour Standards Regulations (C.R.C., c. 986)</i>	

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Acts	Regulations	Guidelines
	<i>Canada Occupational Health and Safety Regulations</i> (SOR/86 304)	
<i>Territorial Lands Act</i> (R.S. 1985, c. T-7)	<i>Northwest Territories and Nunavut Mining Regulations</i> (C.R.C., c. 1516) <i>Territorial Land Use Regulations</i> (C.R.C. 1524) <i>Territorial Quarrying Regulations</i> (C.R.C. c. 1527)	
<i>Nunavut Waters and Nunavut Surface Rights Tribunal Act</i> (2002, c. 10)	<i>Northwest Territories Waters Regulations</i> (SOR/93/303)	
<i>Nunavut Act</i> (1993 c.28)	<i>Nunavut Archaeological and Paleontological Sites Regulations</i> (SOR/2001-220)	
<i>Nunavut Agreement Act</i> (1993, c. 29)		
Territorial - Nunavut		
<i>Environmental Protection Act</i> (RSNWT (Nu) 1988, c E-7)	<i>Spill Contingency Planning and Reporting Regulations</i> (NWT Reg (Nu) 068-93)	NWT Guideline on Dust Suppression Guideline for the General Management of Hazardous Waste in Nunavut Environmental Guideline for Waste Asbestos Guideline for Industrial Waste Discharges in Nunavut Guideline for Industrial Projects on Commissioner's Land
<i>Historical Resources Act</i> (RSNWT (Nu) 1988, c H-3)		
<i>Territorial Parks Act</i> (RSNWT (Nu) 1988, c T-4)	<i>Territorial Parks Regulations</i> (RRNWT (Nu) 1990 c T-13)	
<i>Wildlife Act</i> (RSNWT (Nu) 1988, c W-4)	<i>Wildlife General Regulations</i> (NWT Reg (Nu) 026-92) <i>Wildlife Licenses and Permits Regulations</i> (NWT Reg (Nu) 027-92) <i>Wildlife Management Barren-Ground Caribou Areas Regulations</i> (NWT Reg (Nu) 099-98) <i>Wildlife Management Zones Regulations</i> (RRNWT (Nu) 1990 c W-17) <i>Wildlife Regions Regulations</i> (NWT Reg (Nu) 108-98)	
<i>Commissioner's Land Act</i> (RSNWT 1988, c C-11)	<i>Commissioner's Land Regulations</i> (RRNWT 1990, c C-13)	
<i>Mine Health and Safety Act</i> (SNWT (Nu) 1994, c 25)	<i>Mine Health and Safety Regulations</i> (NWT Reg (Nu) 125-95)	

Table B-02. Summary of Land and Water Access Permits/Licenses for the Project (as of July 2017)

Permit	Expiry (year-mo-day)	Agency	Description
KTL204C012	2017-12-12	KIA	Boulder: Staking/prospecting, exploration (ground/air geophysics), geophysical survey, gridding and drilling.
KTL204C020	2017-12-12	KIA	Boot: Exploration (air/ground geophysics), staking, prospecting, fly/survival camp and drilling.
KTL304C017	2017-12-12	KIA	Goose: Staking/prospecting, exploration (ground/air geophysics), drilling, bulk sampling, bulk fuel storage, camp, winter road, all-weather airstrip and connecting road.
KTL304C018	2017-12-12	KIA	George: Staking/prospecting, exploration (ground/air geophysics), drilling, bulk sampling, bulk fuel storage, camp, winter road, all-weather airstrip.
KTL312C004	2017-12-12	KIA	Wishbone/Malley: Exploration (air/ground geophysics), staking, prospecting, fly/survival camp and drilling
KTL304F049	2017-12-12	KIA	Winter road connecting Bathurst Inlet - Goose and George.
KTP11Q001	2017-12-12	KIA	Goose rock quarry.
KTP12Q001	2017-12-12	KIA	Goose Airstrip borrow area.
KTP12Q002	2017-12-12	KIA	George borrow quarry.
N2011F0029	2018-12-13	INAC	Winter Road connecting George-Goose.
N2017F0016	2022-07-20	INAC	Winter Road connecting Bathurst Inlet - Back River Project.
N2012C0003	2019-02-06	INAC	Wishbone-Malley Mineral Exploration activities on Crown Land
N2016C0011	2021-10-26	INAC	Back River Exploration activities.
2BE-GOO1520	2020-02-18	NWB	Goose water licence.
2BE-GEO1520	2020-05-29	NWB	George water licence.
2BE-MLL1722	2022-06-29	NWB	Wishbone-Malley water licence.

Table B-03. Primary Project Approval Requirements

Responsible Authority	Legislation	Authorization	Project Activity	Permitting Strategy/Timeline
Nunavut Impact Review Board	Nunavut Agreement Article 12 Nunavut Planning and Project Assessment Act (S.C. 2013, c. 14, s. 2)	Project Certificate	Required to obtain requisite permits and approvals to proceed with Project	Sabina aims to obtain a Project Certificate from NIRB by Q2/Q3-2016
Kitikmeot Inuit Association	Nunavut Agreement Article 26	Inuit Impact and Benefits Agreement	Required to proceed with Project	Sabina aims to conclude successful negotiation of an IIBA after receiving a Project Certificate. Compensation agreements may form part of the IIBA.
	Nunavut Agreement Article 20	Inuit Water Rights Compensation Agreement	May be required	
	Nunavut Agreement Article 6	Wildlife Compensation Agreement		
	Nunavut Agreement	Inuit Owned Lands - Commercial Land Use Lease	Access surface IOL to develop mine	Sabina intends to submit its commercial land use and quarry concession permit applications to the KIA once NIRB has issued a positive final hearing report to the Minister. Submission timing: mid-2016
Inuit Owned Lands - Quarry Concession Licenses		Extract aggregate on IOL		
Nunavut Water Board	Nunavut Agreement Article 13 <i>Nunavut Waters and Nunavut Surface Rights Tribunal Act</i> Nunavut Waters Regulations	Type A and B Water Licenses	Required for water use and waste disposal	Sabina intends to submit its Type A Water Licence in Q2/Q3 of 2016. Sabina plans to utilize its existing Type B Water Licenses or new licenses with already screened activities for initial construction activities, if necessary.
Indigenous and Northern Affairs Canada	<i>Territorial Lands Act</i> Canadian Mining Regulations	Prospector License Mineral leases	To obtain and hold subsurface mineral rights	Sabina intends to submit its land use and quarry permit applications to INAC once NIRB has issued a positive final hearing report to the Minister.
	Territorial Land Use Regulations	Crown Land - Class A and Class B Land Use Permits	Access surface Crown lands for initial Project development, prior to obtaining leases	
		Crown Land - Land lease and Waterlot lease	Access surface Crown lands for the Project life	Sabina plans to utilize its existing land use permits and/or will apply for new interim land use permits to support initial construction, to address delays in receipt of leases, if necessary.
	Territorial Quarrying Regulations	Crown Land - Quarry Lease/Permit	Extract aggregate on Crown Land	

Table B-03: Primary Project Approval Requirements (continued)

Responsible Authority	Legislation	Authorization	Project Activity	Permitting Strategy/Timeline
Transport Canada	<i>Navigation Protection Act</i>	Approval and/or Exemption	Construction of works in navigable water to protect navigation channels	Sabina will seek feedback from Transport Canada on potential impacts to navigation during review of the FEIS, and will submit formal applications under the <i>Navigation Protection Act</i> for relevant in-water works once detailed engineering has been completed. Submission timing: 2016
	<i>Canada Shipping Act Response Organizations and Oil Handling Facilities Regulations</i>		Approved Oil Pollution Emergency Plan (OPEP)	Conceptual OPEP included with this FEIS for Transport Canada comment. Formal submission of the OPEP to Transport Canada for approval will follow detailed engineering.
	<i>Canada Shipping Act Response Organizations and Oil Handling Facilities Regulations</i>		Approved Ship Oil Pollution Emergency Plan (SOPEP)	Formal submission of the SOPEP to Transport Canada for approval prior to shipping
Fisheries and Oceans Canada	<i>Fisheries Act</i> (Section 35(2))	Authorization under Paragraph 35(2)(b) of the <i>Fisheries Act</i> ; required if serious harm to fish cannot be avoided. In instances in which serious harm to fish can be avoided, DFO may provide a letter of authorization in addition to compliance with Measures to Avoid Causing Harm to Fish and Fish Habitat.	Project activities directly removing or altering fish habitat: full lake dewatering, culvert installations, dam construction in watercourses, stream flow reductions and potential water and sediment quality changes.	Sabina's application for an Authorization under the <i>Fisheries Act</i> presented as Appendix V12-1D of the DEIS will be finalized after receiving a Project Certificate.
Environment Canada	<i>Fisheries Act</i> (Section 36) Metal Mining Effluent Regulations	Schedule 2 Amendment	Deposit of tailings in fish-bearing waters	Should Sabina require a Schedule 2 Amendment Sabina intends to submit its request in the first half of 2016.

(continued)

Table B-03: Primary Project Approval Requirements (continued)

Responsible Authority	Legislation	Authorization	Project Activity	Permitting Strategy/Timeline
Natural Resources Canada	<i>Explosives Act</i> and Regulations Blasting Permits Explosive Magazine Permits Radio Licensing	Licence for a Factory and Magazine	Required for construction of explosives factories and magazines and storage of explosives	Sabina's explosives contractor (once contracted) will obtain the requisite licence(s).
GN Culture and Heritage	Nunavut Archaeological and Palaeontological Sites Regulations (Nunavut) <i>Nunavut Historical Resources Act</i>	Archaeology Permit	Required to conduct archaeology surveys and to mitigate cultural/heritage resources	Archaeological permit applications will be submitted to the GN-CH by March 31 by Sabina's consulting archaeologist for survey or mitigation field work planned for the upcoming summer.
Nunavut Research Institute	<i>Scientist Act</i> (Nunavut)	Scientific Licenses: Land and Water Social and Traditional Knowledge	Undertake non-biological and non-cultural heritage baseline and monitoring studies	Sabina or its consultants will obtain the requisite scientific licenses as required prior to and during the life of the Project.
GN Environment	<i>Environmental Protection Act</i> (Nunavut) Spill Contingency Planning and Reporting Regulations(Nunavut)	Approval of Spill Contingency Plan		Sabina will submit its Spill Contingency Plan for approval as part of the Type A Water Licence Application. Submission timing: mid-2016
	<i>Environmental Protection Act</i> (Nunavut)	Hazardous Waste Generator		Sabina is currently registered as a hazardous waste generator
	<i>Wildlife Act</i> (Nunavut)			Sabina or its consultants will obtain the requisite wildlife research permits as required prior to and during the life of the Project.
GN Health and Social Services	<i>Public Health Act</i> (Nunavut) Camp Sanitation Regulations (Nunavut)	Approval of camp facilities	Construction and operation of camp, medical facilities, buildings and propane storage	Prior to construction and occupancy
	<i>Emergency Medical Aid Act</i> (Nunavut)	Medical facilities approval		

(continued)

Table B-03: Primary Project Approval Requirements (completed)

Responsible Authority	Legislation	Authorization	Project Activity	Permitting Strategy/Timeline
GN Community and Government Services	Building Codes (Nunavut)	Building Permits	Construction and operation of camp, medical facilities, buildings and propane storage	Prior to construction and occupancy
	<i>Fire Prevention Act</i> (Nunavut) Fire Prevention Regulations (Nunavut) Propane Cylinder Storage Regulations	Approval of camp facilities and propane storage		
Worker's Safety and Compensation Commission of Nunavut - Mine Health and Safety	<i>Explosives Use Act</i> (Nunavut) Explosive Use Regulations (Nunavut)	Authorization to store and use explosives	Required to store detonators in a magazine	Sabina's explosives contractor (once contracted) will obtain the requisite authorization(s).
	<i>Mine Health and Safety Act</i> (Nunavut) Mine Health and Safety Regulations (Nunavut)	Authorization to store and use explosives	Required to store detonators in a magazine	
	<i>Worker's Compensation Act</i> (Nunavut) Workers Compensation Regulations (Nunavut)	Authorization for Activities	Required to proceed with Project activities	Sabina is currently authorized to conduct business in Nunavut. Confirmation will be sought from WSCC if changes to this authorization are required for mine development. Sabina's contractors will be required to seek approval to work in Nunavut.

Notes:

IOL = Inuit Owned Land

Table B-04. Historical Ownership Milestones

Dates	Milestones
1982	BRJV formed.
1985	F.W. Hill (Hill) and Esso Minerals Canada (Esso) was investor and operator.
1985 to 1986	Kerr-McGee Corp. acquired interest in BRJV and was operator in 1986.
1987 to 1996	Homestake Mineral starts to earn into BRJV and becomes operator in 1991.
1997 to 1998	Arauco (later changed name to Kit Resources) acquires BRJV.
1999 to 2002	Kinross starts to earn into BRJV and becomes operator.
2003 to 2004	Miramar starts to earn into BRJV and becomes operator.
2005 to 2008	Dundee Precious Metals (DPM) starts to earn into BRJV and becomes operator.

Source: Summary by AMC Mining Consultants (Canada) Ltd. based on table provided by Sabina Gold & Silver Corp. 2015

Table B-05. Historical Exploration Summary

Operator	Period	Exploration Completed	Drill Holes Completed	Reports or Studies Completed
TWOCL on behalf of BRJV	1982	Reconnaissance exploration	-	-
Back River Joint Venture	1983-1985	Gridding, geological mapping, sampling, exploration drilling, and aeromagnetic surveys	36	-
Hill and Esso	1985	Airborne magnetics and electromagnetic surveys	-	-
Bow Valley	1986	Soil sampling at Del prospect, trenching, exploration drilling	11	-
Kerr-McGee Corp.	1986	Exploration drilling	31	-
Homestake Mineral	1987-1996	Geological mapping, panel and till sampling, exploration and infill drilling, geochemical study, geophysics, legal surveying	656	Prefeasibility and Feasibility Study (George)
Kit Resources	1997-1998	Geological mapping, sampling, exploration and infill drilling	184	Resource Estimate (George)
Kinross	1999-2002	Spectral induced polarization (IP)/resistivity survey, till sampling, geological mapping, channel sampling, soil sampling, exploration and infill drilling	126	Resource Estimate and Conceptual Study (Goose)
Miramar	2003-2004	Exploration and infill drilling	41	NI 43-101 Report
Dundee Precious Metals	2005-2008	Trench sampling, geological mapping, exploration and infill drilling, structural analysis, airborne magnetic, electromagnetic, and radiometric surveys, geochemistry and rock samples	186	NI 43-101 Report

Note: Trigg, Woollett, Olsen Consulting Limited (TWOCL) was the founder of the BRJV.

Table B-06. Characteristics of the Infrastructure Constructed at the Goose Property

Potential Development Area	PDA is 5358 ha with ~15% of area being waterbodies Footprint of facilities is 560 ha
Site Roads	All-weather roads (service road widths of 4.5 m or 8 m; haul road widths of 20 m) will be constructed with run-of-quarry rock placed directly onto the tundra to preserve the permafrost. Construction materials are from locally developed, geochemically suitable rock quarries. Roads will be private and not for public use.
Quarry Sites and Borrow Areas	Estimated aggregate extracted: 5 Mt Number of rock quarries: two Number of borrow areas: none
Water Management	Water supply sources: Big Lake (domestic) and Goose Lake (industrial) Umwelt Lake used as Saline Water Pond (footprint 50 ha) Saline Water pumped back underground to flood Umwelt, Llama and Goose Main U/G workings, and bottom of mined-out Llama Pit Water management ponds (excluding TSF) at Llama (1), Umwelt (2), Echo (2) and Process Plant (1)
Fuel Storage	On-site fuel tank farm consists of 3 steel tanks at 15 ML capacity. Seacans at each underground mine portal, AN facility, incinerator, boilers, and power plant.
Power Generation	Combined heat and power plant consisting of five (N + 1) diesel fired reciprocating engine generator sets. Three generators will be rated for continuous duty 6.6 MW and two generators will be rated for continuous duty 5.1 MW. Seasonal open pit dewatering will be handled by diesel pumps.
Process Plant	Ore production: 19.8 million tonnes of mill feed over 10 years. Standard gravity separation and cyanide leaching circuit.
Explosives	Ammonium nitrate/fuel oil (ANFO) facility Bulk storage area for ammonium nitrate (AN): with capacity for up to 3,900 tonnes of inert AN in seacans Explosive magazines with capacity for 32 tonnes of packaged explosives and 600 cases of detonators within 40-ft and 20-ft magazines, respectively. Bulk ANFO mixing truck. During Closure, unused explosives will be consumed on-site or removed and shipped off-site.
Laydown and Storage Area	General laydown area for material and supplies. Secure seacans for hazardous materials, e.g., mill reagents. Cold storage building.
Waste Management (other than waste rock and tailings)	Waste sorting facility - adjacent to the Process Plant. Landfill(s) - for disposal of non-hazardous, non-leaching, inorganic garbage, located in one or more Waste Rock Storage Areas. Landfarm - for treatment of hydrocarbon contaminated soils or snow. Incinerator - at camp for incineration of camp combustible waste including sewage treatment plant sludge /pacto waste (3.0 kg/person/day). Hazardous waste: temporary storage area at site. Dispose off-site in an approved facility. Used tires and machinery: Remove hazardous waste from equipment not being salvaged, clean and dispose of in active landfill or mine workings.

(continued)

Table B-06. Characteristics of the Infrastructure Constructed at the Goose Property (completed)

Airstrip	<p>An all-weather airstrip and aprons capable of servicing passenger and large cargo aircraft will be constructed at the Goose Property Area. Ice airstrips will continue to be used as required.</p> <p>Dimensions: up to 1,524 m long, 45 m wide.</p> <p>Expected number of flights: Construction: 3-4 per week Operations: 2-3 per week Closure: 2-3 per week Post-closure: 1 per month (summer season)</p> <p>An operations center and automated weather observation station (AWOS) will be located at the airstrip. An emergency back-up diesel generator will be located at the operations center.</p>
Wastewater Treatment	<p>Sewage Treatment Plant provided for 465-person camp. Membrane bioreactor plant housed in 20 ft. container with a separate sludge drying system housed in a 40-ft container. Treated effluent discharged to active tailings facility during Operations. If effluent discharge from the STP meets discharge criteria, effluent will be discharged to land.</p> <p>Oily water treatment plant.</p> <p>For light vehicle and mine maintenance shops - water treated and recycled within shop.</p> <p>Oil to be collected and either burned in an approved waste-heat generator or drummed and removed from site as hazardous waste.</p>
Buildings	<p>Process Plant and crusher buildings; Assay laboratory; explosives magazines; Detonator magazines; AN facility; Reagent storage; Core logging facility; Warehousing facility; Emergency facilities (fire and ambulance station); General maintenance building (site services); Mine maintenance and dry building; Waste management building; Light vehicle maintenance workshop; Heavy equipment maintenance workshop; Wash bay; 465-person camp complete with kitchen, Recreational facilities; Administration complex; Modular potable water treatment system; Modular sewage treatment system; Diesel power plant; Power utility building.</p>
Tailings Management	<p>Tailings Storage Facility (TSF) (footprint 119.1 ha, excluding pond) TSF WRSA Pond (footprint 55 ha) Tailings storage in Umwelt and Goose Main open pits (TFs)</p>
Overburden, Waste Rock Areas and Ore stockpiles	<p>Waste rock storage areas (WRSAs) for Umwelt (39.5 ha), Llama (37.5 ha), and Echo (1.4 ha). WRSA for Goose Main included in TSF.</p> <p>Overburden from quarry and mining areas to be placed in the WRSAs</p> <p>Ore stockpile at the Goose Plant Site. Small temporary stockpiles located at each U/G laydown.</p>
Water Crossings	<p>Up to five water crossings (culverts) with diameters ranging from 1.0 to 2.5 m.</p>

Table B-07. Characteristics of the Infrastructure Constructed at the Marine Laydown Area

Potential Development Area	653 ha Footprint of facilities = 20 ha
Site Roads	All-weather roads (all are service roads, widths of 4.5 m or 8 m) will be constructed on the site. Construction materials are from locally developed, geochemically suitable rock quarries. Roads will be private and not for public use.
Quarry Sites and Borrow Area	Estimated aggregate extracted: 1.3 Mt Number of rock quarries: none, cut from MLA Fuel Storage area used as fill for remaining pads. Number of borrow areas: none
Water Management	Water supply source: Bathurst Inlet - Desalination unit No water management ponds
Fuel Storage	On land storage of 60 ML (four tanks at 15 ML) Fuel delivered by sealift during open water season. Seacans as required (camp/shop facility)
Power Generation	Combined heat and power plant consisting of three (N + 1), 500 kW diesel fired reciprocating engine generator sets.
Laydown and Storage Area	Ammonium nitrate storage area: up to 3,900 tonnes inert AN in seacans
Waste Management	Landfarm - for treatment of hydrocarbon contaminated soils or snow Incinerator - at camp for incineration of combustible waste including sewage Pacto waste Hazardous waste: lined hazardous waste storage area. Hazardous waste temporarily stored then shipped off-site for ultimate disposal during annual sealift season.
Airstrip	Airstrip capable of accepting aircraft constructed on ice during winter. Access by floatplanes during open water, if necessary.
Wastewater Treatment	Oily water treatment plant. Oil to be collected and either burned in an approved waste-heat generator, or drummed and removed from site as hazardous waste.
Sewage Treatment	Waste collected from Pacto systems will be incinerated.
Buildings	Laydown areas; Explosives magazines; Reagent storage; Warehousing facility; Emergency facilities (fire and ambulance station); General maintenance building (site services); Waste management building; 75-person camp and Administration complex (workforce with contingency) complete with kitchen, dry and recreational facilities; Administration complex; Modular desalination water treatment system; Diesel power plant; Power utility building.
In Water Construction	Floating terminal barge that will accept lightering barges. There are no permanent in-water works.

Table B-08. Dimensions of Open Pits at End of Operations

Open Pit	Footprint (ha)	Depth (m)	Volume (Mm ³)
Umwelt	16	135	7.8
Llama	13	135	5.6
Echo	33	45	0.4
Goose Main	24	150	10.8

Table B-09. Closure Objectives and Criteria - Open Pit Workings

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Meet Canadian Ambient Air Quality standards	Best management practices for controlling fugitive and exhaust emissions during active reclamation will be implemented	Routine air quality monitoring
Land	Reduce the potential for inadvertent access by humans to slopes that are dangerous or unstable - mostly completed during Operations as progressive reclamation	Stabilize all slopes to the extent possible. It is noted that the partial backfilling with tailings (Umwelt TF and Goose Main TF) and flooding will both increase stability.	Physical inspection by a qualified engineer; construction of the safety berms during Operations as progressive reclamation to extent possible
		Define a setback line in accordance with rock mechanics studies conducted for pit stability Berms will be constructed around the open pit outside of the setback lines where slopes will exist above final water levels	
	Meet appropriate design levels for engineered structures for closure	The pit overflow structures and pipeline to WTP (Goose Main TF and other pits if needed) will be designed and constructed according to the extreme precipitation event selected for its design	Design and construction of the overflow structures and pipeline
Water	Reduce and control contaminated drainage from the flooded pits	Integrate a water management plan to reduce and control contaminated drainage from the flooded pits	Routine monitoring and sampling; water treatment if required
		Implement a system to manage these waters, and to treat as necessary to meet site permit water quality objectives before release	
	Ensure outflow from the flooded open pits meets water licence criteria	Prior to overflow, the water quality will be profiled and the most appropriate treatment method will be determined if necessary (e.g., in-pit treatment or through the WTP)	Routine monitoring and sampling; in-pit or water treatment at the WTP if required

(continued)

Table B-09. Closure Objectives and Criteria - Open Pit Workings (complete)

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
	Control pit flooding	The bottom of Llama Pit will be partially filled with saline water to form meromictic conditions. Umwelt Pit and Goose Main OP will be partially filled with tailings. After that, all 4 pits will be passively flooded with natural runoff and precipitation such that they can become natural outflow systems.	Routine monitoring and sampling; in-pit water treatment or water treatment at the WTP as necessary prior to release of open pit water
Wildlife	Discourage access to open pit - mostly completed during Operations as progressive reclamation	A plan will be developed to allow for reasonable exit should access occur All pit access ramps will be secured by rock berm barricades	Physical inspection; construction of rock barricades during Operations as progressive reclamation
	Reduce the possibility that water in the flooded open pits will affect wildlife health	Prior to overflow, the water quality will be profiled and the most appropriate treatment method will be determined if necessary (e.g., in-pit treatment or through the WTP)	Routine monitoring and sampling; in-pit water treatment or water treatment at the WTP, if required
Health and Safety	Allow emergency access and exit from flooded pits - mostly completed during Operations as progressive reclamation	A plan will be developed to allow for reasonable exit should inadvertent access occur	Physical inspection
	Reduce the potential for inadvertent access by humans to slopes that are dangerous or unstable - mostly completed during Operations as progressive reclamation	Define a setback line in accordance with rock mechanics studies conducted for pit stability. Berms will be constructed around the open pit outside of the setback line where slopes will exist above the final water line	Physical inspection by a qualified engineer; construction of the berms during Operations as progressive reclamation to extent possible
	Reduce the possibility that water quality of downstream flows will affect human health	The effluent water quality will be monitored and the most appropriate treatment method will be determined if necessary	Routine monitoring and sampling downstream of the decommissioned pits; in-pit water treatment or water treatment at the WTP as necessary prior to release of open pit water
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

WTP = water treatment plant

Table B-010. Dimensions of Underground Workings at End of Operations

Deposit	Depth (mbgs)		# Vent Raises	Volume* (Mm ³)
	From	To		
Umwelt	135	650	2	0.76
Llama	135	380	1	0.32
Echo	45	325	1	0.15
Goose Main	150	390	1	0.39

Note: mbgs: meters below ground surface; * open volume after backfilling (required ground stability)

Table B-011. Closure Objectives and Criteria - Underground Mine Workings

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	N/A	N/A	N/A
Land	Eliminate access to underground mine workings and surface openings	The portals will be backfilled with waste rock and the vent raises will be capped to eliminate the access to the underground mine workings	Physical inspection and monitoring
	Remove hazardous materials from the underground mine	Fuels, oils, chemicals, etc. will be removed for disposal offsite at a licensed facility prior to flooding	Physical inspection and monitoring
Water	Eliminate access to underground mine workings and surface openings	The portals will be backfilled with waste rock and the vent raises will be capped to eliminate the access to the underground mine workings	Physical inspection and monitoring
	Allow underground to flood.	The Llama U/G, Umwelt U/G and Goose Main U/G workings will be flooded with water from the Saline Water Pond. Echo U/G workings will be flooded with site contact water.	Initial physical monitoring to check flooding, but limited once ventilation is turned off.
Wildlife	Eliminate access to underground mine workings and surface openings	The portals will be backfilled with waste rock and the vent raises will be capped to eliminate the access to the underground mine workings	Physical inspection and monitoring
Health and Safety	Eliminate access to underground mine workings and surface openings	The portals will be backfilled with waste rock and the vent raises will be capped to eliminate the access to the underground mine workings	Physical inspection

(continued)

Table B-011. Closure Objectives and Criteria - Underground Mine Workings (complete)

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
	Ensure the stability of underground workings after closure	The underground will be designed and mined to be physically stable; it will be back-filled as needed during Operations	Meet appropriate design levels, physical inspection and crown pillar stability assessment by a qualified engineer and monitoring
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-012. Dimensions of Waste Rock Storage Areas at End of Operations

WRSA	Footprint (ha)	Height (m)	Tonnage (Mt)
Umwelt	39.5	34	20
Llama	37.5	30	16
Echo	3.3	15	1.2
TSF WRSA	119.1	14	27

Table B-013. Closure Objectives and Criteria - Waste Rock Storage Areas

Component	Closure Objectives	Closure Criteria	Actions/Measurements
Air	Meet Canadian Ambient Air Quality standards	Best management practices for controlling fugitive and exhaust emissions will be implemented during active reclamation	Routine air quality monitoring
Land	Confirm the WRSA slopes and top are stable	The WRSAs will be designed for closure and will account for seismic and permafrost conditions	Physical inspection by a qualified engineer, and monitoring
		A thermal cover of NPAG rock will be placed on the WRSAs surface during progressive reclamation and closure to limit acid generating reactions	Thermistors to monitor verify that the piles are frozen throughout except for the predicted active layer
Water	Confirm runoff and seepage is collected	The runoff and seepage from the WRSAs will continue to be directed to the contact water storage ponds or the active TF and eventually pumped for treatment in the WTP, as per operational practices, until monitoring results demonstrate that water quality conditions from the WRSAs are acceptable for direct discharge	Physical inspection. Routine monitoring and sampling
	Confirm runoff and seepage from the WRSAs meet water licence criteria	As above	Routine monitoring and sampling
Wildlife	Ensure the WRSA surfaces are safe for wildlife	WRSAs at post-closure will not compromise wildlife safety	Physical inspection
	Reduce the possibility that water from the WRSAs will affect wildlife health	The runoff and seepage from the WRSAs will continue to be directed to the contact water storage ponds or the active TF and eventually pumped for treatment in the WTP, as per operational practices, until monitoring results demonstrate that water quality conditions from the WRSAs are acceptable for direct discharge	Routine monitoring and sampling
Health and Safety	Ensure the WRSAs are safe for monitoring and physical inspections	WRSAs at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

WRSA = waste rock storage area; WTP = water treatment plant

Table B-014. Dimensions of Tailings Storage Facilities at End of Operations

Tailings Facility	Footprint (ha)	Height (m)	Tonnage (Mt)	Volume (Mm ³)
Tailings Storage Facility (TSF)	119.1*	14	3.8**	3.1**
Umwelt Tailings Facility (TF)	within mined-out Umwelt Pit	5 (mbgs)	8.6	7.2
Goose Main Tailings Facility (TF)	within mined-out Goose Main Pit	31.3 (mbgs)	7.4	6.2

Notes: * Includes capacity for storage of waste rock from Goose Main OP; ** TSF only

Table B-015. Closure Objectives and Criteria - Buildings and Equipment

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Meet Canadian Ambient Air Quality standards	Best management practices reclamation will be implemented for controlling fugitive and exhaust emissions during active	Routine air quality monitoring
	Control dust generation from demolition and active reclamation activities	Best management practices to control dust	Implement controls and routine air quality monitoring
Land	Maintain required site infrastructure during active reclamation	Reduce the use of facilities after closure to promote early decommissioning	Physical inspection
	Clean up and remove machinery, materials and equipment	Machinery, materials and equipment will be will be disposed of in an on-site landfill	Physical inspection
		Fluid hydrocarbons drained from equipment will be burned in generators or incinerated where approved. Other fluids will be removed from site for recycling or disposal at a licenced facility	Physical inspection
	Remove all hazardous wastes	Hazardous wastes will be shipped offsite for disposal at a licensed facility	Physical inspection
	Remove all fuels, chemicals and industrial wastes	During or prior to closure, a site inventory of all these products will be updated Any unused petroleum products will be burned in generators or incinerated where approved. Other chemicals will be sold, returned to suppliers or shipped offsite for disposal at a licensed facility.	Physical inspection
Remove surface infrastructure	Any above-ground infrastructure will be offered to third parties at closure for potential reuse elsewhere, otherwise it will be dismantled and buried in a landfill	Physical inspection	

(continued)

Table B-015. Closure Objectives and Criteria - Buildings and Equipment (completed)

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
		Remaining concrete structures at grade will be perforated and covered or removed to a landfill. The area will be re-graded to promote natural drainage	
	Remove contaminated soils	An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons	Physical inspection
		A more detailed investigations will be carried out of the potential soil contaminated areas (i.e., Phase 1 and 2 ESA investigations) to determine the extent of the contamination	Environmental Site Assessment
		Selected hydrocarbon contaminated soils will be excavated and hauled to the landfarm area for remediation	Physical inspection
Water	Ensure runoff is channelled through the watershed	Surfaces will be re-graded to promote natural drainage	Physical inspection and monitoring
Wildlife	Ensure the remaining surface areas are safe for wildlife use and access	Remaining areas will be scarified and remaining concrete structures at grade will be perforated and covered and rebar will be cut in pieces and buried or removed to a landfill	Physical inspection
Health and Safety	Ensure reclaimed areas support continuation of human land use activities	Human land use of the reclaimed area at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-016. Closure Objectives and Criteria - Mine Infrastructure

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Meet Canadian Ambient Air Quality standards	Best management practices will be implemented for controlling fugitive and exhaust emissions during active reclamation	Routine air quality monitoring
	Control dust generation from demolition and active reclamation activities	Best management practices to control dust	Implement controls and routine air quality monitoring
Land	Clean up and remove components or materials	All components and materials will be disposed of in an on-site landfill	Physical inspection
		Fluid hydrocarbons drained from components will be burned in generators or incinerated where approved. Other fluids will be removed from site for recycling or disposal at a licenced facility	Physical inspection
	Remove all reagent and hazardous wastes	Unused reagents will be returned to suppliers or shipped off-site by a licenced handler	Physical inspection
		Hazardous wastes will be removed for disposal at a licensed facility	
	Remove all fuels, chemicals and industrial wastes	During or prior to closure, a site inventory of all these products will be updated	Physical inspection
		Any unused petroleum products will be burned in generators or incinerated where approved. Other chemicals will be sold, returned to suppliers or removed for disposal at a licensed facility	
	Remove surface infrastructure	Any above-ground infrastructure will be offered to third parties at closure for potential reuse elsewhere; otherwise, it will be dismantled buried in an on-site landfill	Physical inspection
		Remaining concrete structures at grade will be perforated and covered or removed to a landfill. The area will be re-graded to promote natural drainage	
	Remove contaminated soils	An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons	Physical inspection
A more detailed investigations will be carried out of the potential soil contaminated areas (i.e., Phase 1 and 2 ESA investigations) to determine the extent of the contamination		Environmental Site Assessment	
Selected hydrocarbon contaminated soils will be excavated and hauled to the landfarm area for remediation		Physical inspection	
Water	Ensure runoff is channelled through the watershed	Surfaces will be re-graded to promote natural drainage	Physical inspection and monitoring

(continued)

Table B-016. Closure Objectives and Criteria - Mine Infrastructure (completed)

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Wildlife	Ensure the remaining surface areas are safe for wildlife use and access	Remaining areas will be scarified and remaining concrete structures at grade will be perforated and covered or removed to a landfill	Physical inspection
Health and Safety	Ensure reclaimed areas support continuation of human land use activities	Human land use of the reclaimed area at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-017. Closure Objectives and Criteria - Roads and Airstrips

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Meet Canadian Ambient Air Quality standards	Best management practices will be implemented for controlling fugitive and exhaust emissions during active reclamation	Routine air quality monitoring
	Control dust generation from decommissioning and active reclamation activities	Best management practices to control dust	Implement controls and routine air quality monitoring
Land	Ensure preservation of permafrost	Culverts will be removed and the natural drainage restored. Roads and the airstrip will be scarified when they become redundant; they will otherwise remain intact for preservation of permafrost	Physical inspection
Water	Ensure drainage is restored	Culverts will be removed and the natural drainage restored	Physical inspection
Wildlife	Ensure the remaining surface areas are safe for wildlife use and access	The roads and airstrip will be designed to be safe for wildlife use and access for Operations - no additional work is expected at closure except for scarification and the removal of the culverts	Physical inspection
Health and Safety	Ensure reclaimed areas support continuation of human land use activities and do not become a source of contamination	Human land use of the reclaimed area at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-018. Closure Objectives and Criteria - Waste Management Facilities

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Meet Canadian Ambient Air Quality standards	Best management practices will be implemented for controlling fugitive and exhaust emissions during active reclamation	Routine air quality monitoring
	Control dust generation from decommissioning and active reclamation activities	Best management practices to control dust	Implement controls and routine air quality monitoring
Land	Treat contaminated soils, ice and snow in the landfarm areas	As per operational practices contaminated soils, ice and snow will be treated in the landfarm areas during the active closure stage	Physical inspection
		Remediated soils will be hauled and disposed of in landfills or used for construction of the WRSAs cover	Physical inspection
	Clean up and remove waste management system components or materials	All components or materials will be cleaned up and disposed in the on-site landfill when they are no longer required	Physical inspection
		Metals will be separated and shipped off-site as scrap if economical to do so or disposed of in the on-site landfill	
	Remove all hazardous wastes	Hazardous wastes will be removed for disposal at a licensed facility Used oils and waste fuel could be burned in the on-site incinerators if required and approved	Physical inspection
	Remove surface infrastructure	Any above-ground infrastructure will be demolished/dismantled and the non-hazardous debris will be disposed in the on-site landfill or within the mined-out open pits Remaining concrete structures at grade will be perforated and covered. Any rebar will be cut in pieces and buried or removed and the area re-graded to promote natural drainage	Physical inspection
	Landfills are encapsulated	The landfill areas will be covered with 5 m NPAG waste rock when they are no longer required	Physical inspection
Water	Ensure runoff is channelled through the watershed	Surfaces will be re-graded to promote natural drainage	Physical inspection
Wildlife	Ensure the remaining areas are safe for wildlife use and access	Keep wildlife out of the landfills as per operational practices. Place the 5 m NPAG cover when they are no longer required The remaining areas will be re-graded to reduce hazards to wildlife	Physical inspection
Health and Safety	Ensure reclaimed areas support continuation of human land use activities	Human land use of the reclaimed area at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-019. Site-Specific Water Quality Objectives for Arsenic and Copper

Parameter	MMER (mg/L)	CCME (mg/L)	Site-Specific Water Quality Objective (mg/L)
Total Arsenic	0.5	0.005	0.01
Total Copper	0.3	0.002	0.0042

Table B-020. Closure Objectives and Criteria - Water Management Facilities

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Control dust generation from active reclamation activities	Best management practices to control dust	Implement controls and routine air quality monitoring
Land	Maintain surface water drainage control systems	Fresh water intakes and distribution system will be reclaimed after active closure	Physical inspection
		Maintain water management components until they are no longer required	Physical inspection
	Ensure berms and dams are stable	Berms and dams will be breached once water quality meets licence criteria for direct discharge. TSF dam will only be breached on left abutment (i.e., north of TSF WRSA pond) by excavating a spillway in the berm.	Physical inspection by qualified engineer
	Remove surface infrastructure (i.e., pipelines, culverts, pump systems, WTP)	All components or materials will be cleaned up and disposed in the on-site landfill when they are no longer required	Physical inspection
		Any above ground pipelines will be dismantled and associated distribution equipment will be disposed in the on-site landfill	Physical inspection
		Reclaimed areas will be re-graded	Physical inspection
		Any culverts and equipment will be removed and will be disposed in the on-site landfill	Physical inspection
		Any above-ground infrastructure will be demolished/dismantled and the non-hazardous debris will be disposed in the on-site landfill or within the mined-out open pits	Physical inspection
Remaining concrete structures at grade will be perforated and covered. Any rebar will be cut in pieces and buried or removed and the area re-graded to promote natural drainage	Physical inspection		

(continued)

Table B-020. Closure Objectives and Criteria - Water Management Facilities (completed)

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
	Remove all hazardous wastes	Hazardous wastes will be removed for disposal at a licensed facility	Physical inspection
Water	Ensure runoff is channelled through the watershed	Surfaces will be re-graded to promote natural drainage	Physical inspection
	Ensure collected runoff and seepage meets water licence criteria	Runoff and seepage collected in the Goose Main TF will be treated through the WTP until water quality meets licence criteria for direct discharge	Routine monitoring and sampling
	Remove facilities when treatment is no longer required	When water quality from the mine components is deemed suitable for direct discharge to the environment the berms will be breached	Routine monitoring and sampling
Wildlife	Discourage wildlife from entering the facilities	Wildlife will be discouraged from entering the facilities until water quality is acceptable	Physical inspection
Health and Safety	Ensure the remaining areas are left in a healthy state that supports continuation of human land use activities	Human land use of the reclaimed areas at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-021. Water Management Structure Breach Schedule during Closure Period

Berm	Timing of Breach	Number of Breach Locations
Llama Non-Contact Water Diversion (Southwest, South)	Active Closure	1
SWP Contact Water Diversion	Active Closure	4
Ore Stockpile Pond Contact Water Diversion	Active Closure	2
Echo Non-Contact Water Diversion	Active Closure	2
Echo WRSA Contact Water Diversion	Active Closure	1
Echo WRSA Pond Contact Water Diversion	Active Closure	1
Llama Reservoir	Passive Closure	1
Llama WRSA Contact Water Diversion	Passive Closure	1
Umwelt TF	Passive Closure	1
Umwelt WRSA Contact Water Diversion	Passive Closure	1
Goose Main TF	Passive Closure	1
Goose Main TF Non-Contact Water Diversion	Passive Closure	1
TSF Contact Water Diversion	Passive Closure	3
TSF WRSA Pond Dam	Passive Closure	1

Table B-022. Closure Objectives and Criteria - Quarries and Granular Borrow Sites

Component	Closure Objectives	Closure Criteria	Actions/ Measurements
Air	Control dust generation from active reclamation activities	Best management practices to control dust	Implement controls and routine air quality monitoring
Land	Surfaces are stabilized	Quarries and granular borrow sites will be contoured to achieve gentle side slopes	Physical inspection
Water	Channel runoff through the watershed	Surfaces will be re-graded to promote natural drainage, new surface drainage patterns will be established if needed	Physical inspection
	Meet Water Licence criteria for runoff	A water management strategy will be implemented to control the transport of sediments out of borrow and quarry areas should it be encountered.	Physical inspection
Wildlife	Ensure surfaces are safe for wildlife use and access	Quarries and granular borrow sites will be re-contoured to reduce hazards to wildlife	Physical inspection
Health and Safety	Ensure surfaces are left in a healthy state that supports continuation of human land use activities	Land use of the areas at post-closure will not compromise people's health	Routine monitoring and physical inspection
Community	Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement
	Consider transition plans	Community programs will be established to transition into closure	Physical inspection

Table B-023. Proposed Closure and Post-Closure Main Activities Schedule

Component	Description	Operation Phase (Progressive Reclamation)										Closure Phase							Post-Closure Phase		
		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19+	Year 23	
												Active Stage		Passive Stage							
Open Pits	- Flooding of Llama Pit			Flooding with water pumped from Saline Water Pond								Passive flooding with site runoff and precipitation ^a									
	- Filling and flooding of Umwelt Pit		Filling with tailings								Passive flooding with site runoff and precipitation ^a										
	- Filling and flooding of Goose Main Pit						Filling with tailings Active flooding with water pumped from TSF WRSA Pond			Active flooding with water pumped seasonally from TSF WRSA Pond; Passive flooding with site runoff and precipitation Treated in WTP and recirculated to Goose Main TF											
	- Flooding of Echo Pit									Passive flooding with site runoff and precipitation ^a											
	- Place warning signs around Open Pits perimeter and replace as needed, construct rock berm(s)	X (as needed)																			
Underground Mine Workings	- Active flooding of Llama U/G with water pumped from Saline Water Pond				X																
	- Active flooding of Umwelt U/G and Goose Main U/G with water pumped from Saline Water Pond									X											
	- Passive flooding of Echo U/G with site runoff									X											
	- Backfilling with waste rock (for ground support and additional PAG waste rock storage)	Ongoing during mining (mainly completed by Year 6)																			
	- Backfilling portal and capping vent raises				X (Llama U/G)						X (Echo U/G)	X (Umwelt & Goose U/G)									
WRSAs	- Cover placement with NPAG waste rock	Ongoing during mining																			
TSF WRSA	- Cover placement with NPAG waste rock	Ongoing during Operations (mainly completed by Year 6)																			
Machinery and Mobile Equipment	- Decommission machinery and equipment; drain of fluids and leave in OP or U/G. Leave equipment required for closure and post-closure activities in service.										X										
	- Drain fluids from equipment used for closure activities (e.g., trucks, backhoes, etc.) and dispose in landfill																		X		
	- Drain fluids from equipment used for long-term maintenance (e.g., excavators) ^b and dispose in landfill																			X	
Mine Infrastructure	- Decommission facilities and re-grade areas as needed										X										

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Component	Description	Operation Phase (Progressive Reclamation)									Closure Phase								Post-Closure Phase	
		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19+	Year 23
											Active Stage				Passive Stage					
Roads and Airstrip	- Decommission all-weather roads										X (partial)									X
	- Decommission all-weather airstrip																			X
Waste Management Facilities	- Decommission landfill(s)	Simultaneous with WRSAs if capacity reached																X		
	- Remediate contaminated soils in land farms	Ongoing (may continue into Closure and Post-Closure)																		
	- Decommission Sewage Treatment Plant at Goose Property (Pactos used in Closure and Post-Closure)											X								
Water Management Facilities	- Construct spillway on left abutment of TSF Embankment. Breach dams/berms and reclaim channel and pond areas										X			X	X				X	
	- Decommission WTP																		X	
MLA Facilities	- Decommission all infrastructure										X									
Long-term Care and Maintenance (assumed for 13 years) ^b																				
Monitoring											Monitor flooded open pits and contact water reporting from closed mine facilities (post-closure stage duration may be reduced or in-pit treatment may be required)									

^a Passive flooding may start earlier during Operations once each facility is no longer required.

^b Assumed for 13 years after end of Operations; however, Closure schedule dependent on monitoring results. Activities will occur when contact water quality satisfies water licence criteria for direct discharge and/or access to the site is no longer required.

Appendix C. Glossary of Terms and Definitions

Glossary of Terms and Definitions

Term	Definition
Acid Base Accounting (ABA)	Acid base accounting; a static test that defines the amounts, and relative balance, of potentially acid-generating and acid-neutralizing (or base) minerals in a sample.
Active layer	The layer of ground above the permafrost which thaws and freezes annually.
Acid rock drainage (ARD)	Acidic pH rock drainage due to the oxidation of sulphide minerals that includes natural acidic drainage from rock not related to mining activity; an acidic pH is defined as a value less than 6.0.
Advanced mineral exploration	Any appurtenant undertaking in which the proponent requires a Type A or Type B water licence in order to carry out the proposed activities.
Quarries and Granular Borrow Sites	Site from where soils and aggregates are obtained for use in earthworks construction.
Care and maintenance	The status of a mine when it undergoes a temporary closure.
Closure goal	The guiding statement that provides the vision and purpose of reclamation. Attainment of the closure goal happens when the proponent has satisfied all closure objectives. By its nature, the closure goal is a broad, high-level statement and not directly measurable.
Closure principles	The four core closure principles are 1) physical stability, 2) chemical stability, 3) no long-term active care requirements, and 4) future use (including aesthetics and values). The principles guide the selection of closure objectives.
Closure objectives	Statements that describe what the selected closure activities are aiming to achieve; they are guided by the closure principles. Closure objectives are typically specific to project components, are measurable and achievable, and allow for the development of closure criteria.
Closure options	A set of proposed alternatives for closing and reclaiming each mine component. The closure options are evaluated to determine the selected closure activity, which must be approved by the NWB.
Closure criteria	Standards that measure the success of selected closure activities in meeting closure objectives. Closure criteria may have a temporal component (e.g., a standard may need to be met for a pre-defined number of years). Closure criteria can be site-specific or adopted from territorial/federal or other standards and can be narrative statements or numerical values.
Contaminant	1) any physical, chemical, biological or radiological substance in the air, soil, or water that has an adverse effect; and 2) any chemical substance with a concentration that exceeds background levels or which is not naturally occurring in the environment.
Effluent	Water flows being discharged to the environment.
Engagement	The communication and outreach activities a proponent undertakes with affected communities and Aboriginal organizations/governments prior to and during the operation of a project, including closure and reclamation phases.
Environmental Site Assessment (ESA)	Phase I ESA: A review of available information to determine the likelihood of actual or potential environmental impacts. Phase II ESA: An intrusive investigation involving sampling and testing to better define the nature and scope of any environmental impacts.
Explosives	Gunpowder, blasting powder, nitroglycerine, gun-cotton, dynamite, blasting gelatine, gelignite, fulminates of mercury or of other metals and every other substance made, manufactured or used with a view to producing a violent effect by explosion.
Humidify cell test (HCT)	A type of kinetic test in which a small sample (about 1 kg) is placed in an enclosed chamber in a laboratory, alternating cycles of moist and dry air is constantly pumped through the chamber, and once a week the sample is rinsed with water; chemical analysis of rinse water yields concentrations of elements and other parameters used to calculate reaction rates.

APPENDIX C. GLOSSARY OF TERMS AND DEFINITIONS

Term	Definition
Kinetic test	A geochemical procedure for characterizing the chemical status of a sample through time during continued exposure to a known set of environmental conditions, such as a humidity cell.
Landfarm	Infrastructure that uses biological and physical processes to treat (remove contaminants) contaminated soil.
Land owner	The responsible authority with administrative control and ownership of a type of land classified as crown land, commissioners land or Inuit Owned Land. Crown land is land belonging to Her Majesty or in respect of which Government has the power of disposition. In Nunavut, this power rests with Indigenous and Northern Affairs Canada (INAC). Commissions land is land belonging to the Commissioner for the Government of Nunavut; which typically is land within an established municipality administered by a Municipal Corporation and/or the Department of Community Government and Services (CGS) Inuit Owned Land (IOL) are those lands vested in the Designated Inuit Organization (DIO) pursuant the Nunavut Agreement. For this Project the DIO is the Kitikmeot Inuit Association.
Land use permit	For Crown land a Class A Permit or Class B Permit as required by the Territorial Land Use Regulations SOR/82-217, s.1; SOR/88-169, s.2 administered by INAC Lands Department. For IOLs- Land Use Licence I, II or III or Commercial Lease I, II, III as defined by the DIO. For Commissioners land - a permit or lease as required by the Municipal Land Administration Policy.
Leachate	Water or other liquid that has washed (leached) from a solid material, such as a layer of soil or water; leachate may contain contaminants.
Long-term active care	A post-closure mine site is in long-term active care when sustained monitoring and maintenance of active facilities is required (e.g., for more than 25 years). This should be avoided whenever possible.
Metal leaching (ML)	The release of a metal from its solid-phase mineral into mine site drainage; described by concentrations in static tests and by metal release rates obtained from kinetic tests.
Long-term passive care	Occasional monitoring, coupled with infrequent maintenance or repairs that takes place following reclamation in the post closure phase of the mine site. Many mine sites require ongoing passive care, which can be an acceptable practice.
Ore	Rock that is considered economic according to the parameters used in the ore reserve estimate. Ore will be processed at the mineral processing plant after it is mined from the Project underground mine and open pits.
Overburden	A general term referring to soil and broken rock, lying above ore and mine rock, that can usually be removed without blasting; at mines in soft sedimentary rock like coal, overburden can be synonymous with mine rock.
Potentially acid generating (PAG)	Rock with an NP/AP ratio less than 2 as determined by static tests, as defined by MEND (2009). PAG rock can also be operationally defined based on the results of static testing such as ABA and NAG testing.
Passive treatment	Treatment technologies that can function with little or no maintenance over long periods of time (e.g., use of wetlands).
Permafrost	Bedrock or soil that maintains a temperature at or below 0° C for a continuous period of two years or more.
Progressive reclamation	Selected closure activities that can be taken at advanced mineral exploration and mine sites before permanent closure. Progressive reclamation takes advantage of cost and operating efficiencies by using the resources available from an operation to reduce the overall reclamation costs incurred. It enhances environmental protection and shortens the timeframe for achieving the closure objectives.
Proponent	Applicant for, or a holder of, a water licence and/or land use permit.

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Term	Definition
Reclamation	The process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
Reclamation research	Literature reviews, laboratory or pilot-scale tests, engineering studies, and other methods of resolving uncertainties. Proponents conduct reclamation research to answer questions pertaining to environmental risks; the design of reclamation research plans aims to provide data and information which will reduce uncertainties for closure options, selected closure activities, and/or closure criteria.
Remediation	The removal, reduction, or neutralization of substances, wastes, or hazardous material from a site in order to prevent or minimize any adverse effects on the environment and public safety now or in the future.
Risk assessment	Analysis of potential threats and options for mitigation for a given site, component, or condition. Risk assessments consider factors such as risk acceptability, public perception of risk, socio-economic impacts, benefits, and technical feasibility. It forms the basis for risk management.
Salvageable Materials	Decommissioned materials which can be sold or reused elsewhere.
Security deposit	Funds held by the Crown (Aboriginal Affairs and Northern Development Canada) or land owner that can be used in the case of abandonment of an undertaking to reclaim the site or carry out any ongoing measures that may remain to be taken after the abandonment of the undertaking.
Selected closure activity	The closure and reclamation activity chosen from the closure options for each Project component.
Stakeholders	Industry, federal agencies, the territorial government, Aboriginal organizations/governments, land owners, affected communities, proponent, and other parties with an interest in the Project.
Tailings	Material rejected from a mill after the recoverable valuable minerals have been extracted.
Talik	Unfrozen ground surrounded by permafrost.
Traditional Knowledge	Accumulative, collective body of knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual, and political change.
Type A Water Licence	A Type A Water Licence is required if the use is of a type set out in column 2 of Schedule 2 and satisfies a criterion set out in column 5 in respect of an undertaking set out in column 1 of the Nunavut Water Regulations SOR/2013-69 <i>(Note: despite definition of Type B water licence item a), a Type A licence is the appropriate licence for a use of waters if a Type A licence is required for another use of waters, or a deposit of waste, in respect of the same undertaking.)</i>
Type B Water Licence	A Type B water licence is required if the use is of a type set out in column 2 of Schedule 2 and satisfies a criterion set out in column 4 in respect of an undertaking set out in column 1 of the Nunavut Water Regulations SOR/2013-69, or The use satisfies the criterion set out in paragraph 4(1)(a) but does not satisfy one or more criterion set out in paragraphs 4(1)(b) to (d)
Waste rock	All unprocessed rock materials that a mining operation produces.

Appendix D. List of Acronyms, Abbreviations, Units, and Symbols

List of Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AANDC	Aboriginal Affairs and Northern Development Canada (formerly known as Indian and Northern Affairs Canada, now known as Indigenous and Northern Affairs Canada)
ABA	Acid-Base Accounting
AEMP	Aquatic Effects Monitoring Plan
ARD	Acid Rock Drainage
ANFO	Ammonium Nitrate/Fuel Oil
AWAR	All-weather Access Road
BIF	Banded Iron Formation
CCME	Canadian Council for Ministers of the Environment
CLARC	Community Lands and Resources Committee
CLEY	Culture, Language, Elders and Youth
CGS	Community and Government Services
CP	Collection Pond
ICRP	Interim Closure and Reclamation Plan
DFO	Fisheries and Oceans Canada
FCRP	Final Closure and Reclamation Plan
FEIS	Final Environmental Impact Statement
Golder	Golder Associates Ltd.
GN	Government of Nunavut
HADD	Harmful Alteration Disruption or Destruction
HTO	Hunters and Trappers Organizations
INAC	Indigenous and Northern Affairs Canada
ISQG	Interim Sediment Quality Guidelines
KIA	Kitikmeot Inuit Association
LSA	Local Study Area
ML	Metal Leaching
MMER	Metal Mining Effluent Regulations
MVLWB	Mackenzie Valley Land and Water Board
NIRB	Nunavut Impact Review Board
NPAG	non-Potentially Acid Generating
NRC	Natural Resources Canada
NWB	Nunavut Water Board
PAG	Potentially Acid-Generating
Project	Back River Project
PEL	Probable Effect Level
RSA	Regional Study Area
SFE	Shake Flask Extraction
TDS	Total Dissolved Solids
TF	Tailings Facility

TSF	Tailings Storage Facility
TSS	Total Suspended Solids
WRSA	Waste Rock Storage Area
WTP	Water Treatment Plant

List of Units and Symbols

Units/Symbols	Definition
%	percent
°	degrees
°C	degrees Celsius
bgs	below ground surface
dBA	Decibels (A-weighted)
g	gram
H:V	horizontal to vertical
ha	hectares
km	kilometre
km/h	kilometres per hour
km ²	square kilometres
m	metres
m ²	square metres
m ³	cubic metres
m ³ /day	cubic metres per day
masl	metres above sea level
mm	millimetres
mm/year	millimetres per year
mg/L	milligrams per litre
mg/kg	milligrams per kilogram
m ³	cubic metres
Mm ³	million cubic metres
Mt	million tonnes
t	tonnes
tpd	tonnes per day

Appendix E. Lessons Learned from Other Projects

Development	Activity Which Led to Lesson	Lesson Learned	Adaptive Management Result
Ekati, Diavik, and Snap Lake mine sites	Open pit mining	Wildlife injury or mortality may occur by entering the open pit	A rock berm(s) will be constructed around the open pits
Ekati, Diavik, and Snap Lake mine sites	Mine site infrastructure	Wildlife injury or mortality may occur by entering mine site facilities	Disturbed areas will be re-contoured at closure reducing hazards to wildlife
Meadowbank mine site	Landfill located within WRSA	Birds or wildlife injury or mortality by entering the landfill	Landfill will be located within the WRSAs and covered at closure reducing hazards to birds and wildlife

Appendix F. Ongoing Reclamation Studies

To address the uncertainties in the closure and remediation activities, the below ongoing reclamation studies will be considered. These studies will be reviewed on an ongoing bases and considered during Operations to allow potential modifications to be incorporated during progressive and final reclamation. The Table 1 below presents an update to the proposed reclamation studies presented in the Feasibility Study.

Table 1. Updated Proposed Reclamation Studies

Study No.	Description
1	Additional geochemical characterization to characterize the ARD/ML potential of the pit walls that will be above the final pit lake elevations.
2	Confirm cover designs are appropriate through further modelling and monitoring of temperatures, completion of energy balance on model inputs during freeze-back period, permafrost aggregation, active layer thaw in waste rock storage areas, etc.
3	Acquire an estimate of creep parameters for WRSA foundations and perform long-term deformation modelling for physical stability closure objective.
4	Develop an improved estimate of the runoff coefficient from the WRSAs. This will have an impact operationally on pump and pond sizing, and during closure on treatment volume and environmental loading estimates.
5	Collect additional water quality data during the winter to permit less conservative water quality modelling assumptions during the under-ice period.
6	Identify opportunities to locate the saline reservoir outside of Umwelt Lake in order to avoid an MMER Schedule II application for Umwelt Lake. Possible opportunities include building a ring dike containment structure or transporting the connate water to Bathurst Inlet and discharging via a diffuser.
7	Revegetation research focused on large footprint areas which will significantly improve long-term stability and usability of the site follow Closure.

Appendix G. Interim Closure Cost Estimate

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	TOTAL LIABILITY
OPEN PIT	Umwelt	\$35,187	\$35,187
	Llama	\$18,846	\$18,846
	Echo	\$18,625	\$18,625
	Goose Main	\$53,390	\$53,390
QUARRY (under OPEN PIT TAB estimate)	Airstrip Quarry	\$3,800	\$3,800
UNDERGROUND MINE	Umwelt	\$310,467	\$310,467
	Llama	\$89,886	\$89,886
	Goose Main	\$157,010	\$157,010
	Echo	\$96,206	\$96,206
TAILINGS FACILITIES	TSF	\$186,719	\$186,719
ROCK PILE	Umwelt, Llama, Echo and TSF	\$14,400,000	\$14,400,000
BUILDINGS AND EQUIPMENT		\$1,939,431	\$1,939,431
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		\$1,385,630	\$1,385,630
SURFACE AND GROUNDWATER MANAGEMENT		\$158,608	\$158,608
INTERIM CARE AND MAINTENANCE		\$592,201	\$592,201
	SUBTOTAL: Capital Costs	\$19,446,004	\$19,446,004
	PERCENT OF SUBTOTAL		100%
INDIRECT COSTS		COST	TOTAL LIABILITY
MOBILIZATION/DEMOBILIZATION		\$4,165,738	\$4,165,738
POST-CLOSURE MONITORING AND MAINTENANCE		\$5,565,651	\$5,565,651
ENGINEERING	5%	\$972,300	\$972,300
PROJECT MANAGEMENT	5%	\$972,300	\$972,300
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	\$194,460	\$194,460
BONDING/INSURANCE	1%	\$194,460	\$194,460
CONTINGENCY	20%	\$3,889,201	\$3,889,201
MARKET PRICE FACTOR ADJUSTMENT	0%	\$0	\$0
	SUBTOTAL: Indirect Costs	\$15,954,111	\$15,954,111
TOTAL COSTS		\$35,400,115	\$35,400,115

5	Open Pit Name:	Umwelt	Pit #	1	1		
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs	Assumed	each	4	Sabina	\$75.00	\$300	\$300
Berm at crest	Estimated for continous berm with 1m diameter boulders, no spacing between boulders - 0.52 m3/m - assumed 50 % done during Operations	m3	426	RB1H	\$17.05	\$7,263	\$7,263
Block roads	Temporary gate installation to allow water monitoring. It includes decommissioning of gate when no longer required. Exposed area after gate has been decommissioned will be blocked with boulders (exposed area along with block of roads with boulders included in berm cost above)	allow	1	Sabina	\$5,000.00	\$5,000	\$5,000
Other				#N/A	\$0.00	\$0	\$0
STABILITY STUDY							
Conduct stability and setback study		allow	1	Sabina	\$10,000.00	\$10,000	\$10,000
STABILIZE SLOPES							
Off-load crest, soil A		m3		#N/A	\$0.00	\$0	\$0
Off-load crest, soil B		m3		#N/A	\$0.00	\$0	\$0
Doze/trim overburden at crest		m3		#N/A	\$0.00	\$0	\$0
Drill & blast pit crest		m3		#N/A	\$0.00	\$0	\$0
Buttress slope		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
COVER/CONTOUR SLOPES							
Place fill, soil A		m3		#N/A	\$0.00	\$0	\$0
Place fill, soil B		m3		#N/A	\$0.00	\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0	\$0
Vegetate slopes		ha		#N/A	\$0.00	\$0	\$0
Vegetate pit floor		ha		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
CONSTRUCT DIVERSION DITCHES							
Excavate ditches -soil		m3		#N/A	\$0.00	\$0	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0	\$0
CONSTRUCT SPILLWAY							
Excavate channel	200 m long, 6 m wide and 1 m deep	m3	1,200	SB1L	\$4.30	\$5,160	\$5,160
Concrete		m3		#N/A	\$0.00	\$0	\$0
Rip rap		m3	400	RR1L	\$13.50	\$5,400	\$5,400
Other	Geotextile	m2	600	GSTL	\$3.44	\$2,064	\$2,064
RECLAIM QUARRIES							
Contour slopes		m3		#N/A	\$0.00	\$0	\$0
Place overburden		m3		#N/A	\$0.00	\$0	\$0
Vegetate		m3		#N/A	\$0.00	\$0	\$0
FLOOD PIT-Capital							
Remove stationary equipment (sump pumps) and Pipeline	Umwelt TF will be used to store tailings in Years 2 to 6 and it will then passively flood with site runoff and direct precipitation through the remainder of Operations and into the Closure Phase. Pipelines/pumps will be relocated for use in the other active pits (Llama Pit and Goose Main Pit) and removed to closure landfill once they are no longer needed. Dispose of fuel in diesel day tank and oil from pump and landfill cleaned pump. Remove of pumps and pipelines will occur during Operations.	m		#N/A	\$0.00	\$0	\$0
Remove dewatering pipeline		m		#N/A	\$0.00	\$0	\$0
Remove power lines		each		#N/A	\$0.00	\$0	\$0
Construct diversion ditches		m3		#N/A	\$0.00	\$0	\$0
-Ditch, mat'l A		m3		#N/A	\$0.00	\$0	\$0
-Ditch, mat'l B		m3		#N/A	\$0.00	\$0	\$0
Construct embankment/dam		m3		#N/A	\$0.00	\$0	\$0
Supply/install pump station		each		#N/A	\$0.00	\$0	\$0
Supply/install piping system		m		#N/A	\$0.00	\$0	\$0
Remove pump post-closure		each		#N/A	\$0.00	\$0	\$0
Remove pipeline post-closure		m		#N/A	\$0.00	\$0	\$0
FLOOD PIT-Annual Cost							
Operate pumps (power)		m3		#N/A	\$0.00	\$0	\$0
Maintain pump/pipeline		allow		#N/A	\$0.00	\$0	\$0
Labour: fuel management, comissioning/decom		\$/h		#N/A	\$0.00	\$0	\$0
Chemical addition, ____ kg/m3 of water		tonne		#N/A	\$0.00	\$0	\$0
Chemicals, purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0
Passive/biological additives		\$/ha		#N/A	\$0.00	\$0	\$0
Passive additives purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
						Annual pumping costs	\$0
Number of years of pump flooding	passive pit flooding	years	0			Total pumping costs	\$0
						Total	\$35,187
						% of Total	100%

Open Pit Name:		Llama	Pit #		2	2	
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs	Assumed	each	4	Sabina	\$75.00	\$300	\$300
Berm at crest	Estimated for berm with 1m diameter boulders, no spacing between boulders - 0.52 m3/m; berm needed only where pit edge will not abute the final flooded lake footprint.	m3	208	RB1H	\$17.05	\$3,546	\$3,546
Block roads	Temporary gate installation to allow water monitoring. It includes decommissioning of gate when no longer required. Exposed area after gate has been decommissioned will be blocked with boulders (exposed area along with block of roads with boulders included in berm cost above)	allow	1	Sabina	\$5,000.00	\$5,000	\$5,000
Other				#N/A	\$0.00	\$0	\$0
STABILITY STUDY							
Conduct stability and setback study		allow	1	Sabina	\$10,000.00	\$10,000	\$10,000
STABILIZE SLOPES							
Off-load crest, soil A		m3		#N/A	\$0.00	\$0	\$0
Off-load crest, soil B		m3		#N/A	\$0.00	\$0	\$0
Doze/trim overburden at crest		m3		#N/A	\$0.00	\$0	\$0
Drill & blast pit crest		m3		#N/A	\$0.00	\$0	\$0
Buttress slope		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
COVER/CONTOUR SLOPES							
Place fill, soil A		m3		#N/A	\$0.00	\$0	\$0
Place fill, soil B		m3		#N/A	\$0.00	\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0	\$0
Vegetate slopes		ha		#N/A	\$0.00	\$0	\$0
Vegetate pit floor		ha		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
CONSTRUCT DIVERSION DITCHES							
Excavate ditches -soil		m3		#N/A	\$0.00	\$0	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0	\$0
CONSTRUCT SPILLWAY							
Excavate channel	Spillway not required; will follow natural drainage to Umwelt Lake.	m3		#N/A	\$0.00	\$0	\$0
Concrete		m3		#N/A	\$0.00	\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
RECLAIM QUARRIES							
Contour slopes		m3		#N/A	\$0.00	\$0	\$0
Place overburden		m3		#N/A	\$0.00	\$0	\$0
Vegetate		m3		#N/A	\$0.00	\$0	\$0
FLOOD PIT-Captital							
Remove stationary equipment (sump pumps) and Pipeline	In Year 6, the exhausted Llama Pit will be converted to a water reservoir. Water from the Saline Water Pond will be pumped into Llama Reservoir between Year 4 and Year 9. The Llama Reservoir will continue to passively flood with site runoff and direct precipitation through the remainder of Operations and into the Closure Phase. Pipelines/pumps will be relocated for use in the other active pits (Goose Main Pit and Echo Pit) and removed to closure landfill once they are no longer needed. Dispose of fuel in diesel day tank and oil from pump and landfill cleaned pump. Remove of pumps and pipelines will occur during Operations.	m		#N/A	\$0.00	\$0	\$0
Remove dewatering pipeline		m		#N/A	\$0.00	\$0	\$0
Remove power lines		each		#N/A	\$0.00	\$0	\$0
Construct diversion ditches		m3		#N/A	\$0.00	\$0	\$0
-Ditch, mat'l A		m3		#N/A	\$0.00	\$0	\$0
-Ditch, mat'l B		m3		#N/A	\$0.00	\$0	\$0
Construct embankment/dam		m3		#N/A	\$0.00	\$0	\$0
Supply/install pump station		each		#N/A	\$0.00	\$0	\$0
Supply/install piping system		m		#N/A	\$0.00	\$0	\$0
Remove pump post-closure		each		#N/A	\$0.00	\$0	\$0
Remove pipeline post-closure		m		#N/A	\$0.00	\$0	\$0
FLOOD PIT-Annual Cost							
Operate pumps (power)		m3		#N/A	\$0.00	\$0	\$0
Maintain pump/pipeline		allow		#N/A	\$0.00	\$0	\$0
Labour: fuel management, commissioning/decom		\$/h		#N/A	\$0.00	\$0	\$0
Chemical addition, ____ kg/m3 of water		tonne		#N/A	\$0.00	\$0	\$0
Chemicals, purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0
Passive/biological additives		\$/ha		#N/A	\$0.00	\$0	\$0
Passive additives purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
					Annual pumping costs		\$0
Number of years of pump flooding	passive pit flooding	years	0	Total pumping costs		\$0	\$0
						Total	\$18,846
						% of Total	100%

Open Pit Name:		Echo	Pit #		3	3		
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	Total Cost	
CONTROL ACCESS								
Fence		m		#N/A	\$0.00	\$0	\$0	
Signs	Assumed	each	4	Sabina	\$75.00	\$300	\$300	
Berm at crest	Estimated for continous berm with 1m diameter boulders, no spacing between boulders - 0.52 m3/m - assumed 50 % done during Operations	m3	195	RB1H	\$17.05	\$3,325	\$3,325	
Block roads	Temporary gate installation to allow water monitoring. It includes decommissioning of gate when no longer required. Exposed area after gate has been decommissioned will be blocked with boulders (exposed area along with block of roads with boulders included in berm cost above)	allow	1	Sabina	\$5,000.00	\$5,000	\$5,000	
Other				#N/A	\$0.00	\$0	\$0	
STABILITY STUDY								
Conduct stability and setback study		allow	1	Sabina	\$10,000.00	\$10,000	\$10,000	
STABILIZE SLOPES								
Off-load crest, soil A		m3		#N/A	\$0.00	\$0	\$0	
Off-load crest, soil B		m3		#N/A	\$0.00	\$0	\$0	
Doze/trim overburden at crest		m3		#N/A	\$0.00	\$0	\$0	
Drill & blast pit crest		m3		#N/A	\$0.00	\$0	\$0	
Buttress slope		m3		#N/A	\$0.00	\$0	\$0	
Other				#N/A	\$0.00	\$0	\$0	
COVER/CONTOUR SLOPES								
Place fill, soil A		m3		#N/A	\$0.00	\$0	\$0	
Place fill, soil B		m3		#N/A	\$0.00	\$0	\$0	
Rip rap		m3		#N/A	\$0.00	\$0	\$0	
Vegetate slopes		ha		#N/A	\$0.00	\$0	\$0	
Vegetate pit floor		ha		#N/A	\$0.00	\$0	\$0	
Other				#N/A	\$0.00	\$0	\$0	
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	\$0.00	\$0	\$0	
Excavate ditches -rock		m3		#N/A	\$0.00	\$0	\$0	
Rip rap in channel base		m3		#N/A	\$0.00	\$0	\$0	
CONSTRUCT SPILLWAY								
Excavate channel	Spillway not required; will follow natural drainage to Goose Lake.	m3		#N/A	\$0.00	\$0	\$0	
Concrete		m3		#N/A	\$0.00	\$0	\$0	
Rip rap		m3		#N/A	\$0.00	\$0	\$0	
Other				#N/A	\$0.00	\$0	\$0	
RECLAIM QUARRIES								
Contour slopes		m3		#N/A	\$0.00	\$0	\$0	
Place overburden		m3		#N/A	\$0.00	\$0	\$0	
Vegetate		m3		#N/A	\$0.00	\$0	\$0	
FLOOD PIT-Captital								
Remove stationary equipment (sump pumps) and Pipeline	Once mining of the Echo Pit concludes in Year 5, dewatering will continue until Year 9 (i.e., the end of Echo U/G mining) as the two mines will be connected. Starting in Year 10, Echo Pit will passively flood with site runoff and direct precipitation through the remainder of Operations and into the Closure Phase. Pipelines/pumps will be removed to closure landfill. Dispose of fuel in diesel day tank and oil from pump and landfill cleaned pump. Remove of pumps and pipeline will occur during Operations.	m		#N/A	\$0.00	\$0	\$0	
Remove dewatering pipeline		m		#N/A	\$0.00	\$0	\$0	
Remove power lines		each		#N/A	\$0.00	\$0	\$0	
Construct diversion ditches		m3		#N/A	\$0.00	\$0	\$0	
-Ditch, mat'l A		m3		#N/A	\$0.00	\$0	\$0	
-Ditch, mat'l B		m3		#N/A	\$0.00	\$0	\$0	
Construct embankment/dam		m3		#N/A	\$0.00	\$0	\$0	
Supply/install pump station		each		#N/A	\$0.00	\$0	\$0	
Supply/install piping system		m		#N/A	\$0.00	\$0	\$0	
Remove pump post-closure		each		#N/A	\$0.00	\$0	\$0	
Remove pipeline post-closure		m		#N/A	\$0.00	\$0	\$0	
FLOOD PIT-Annual Cost								
Operate pumps (power)		m3		#N/A	\$0.00	\$0	\$0	
Maintain pump/pipeline		allow		#N/A	\$0.00	\$0	\$0	
Labour: fuel management, comissioning/decom		\$/h		#N/A	\$0.00	\$0	\$0	
Chemical addition, ____ kg/m3 of water		tonne		#N/A	\$0.00	\$0	\$0	
Chemicals, purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0	
Passive/biological additives		\$/ha		#N/A	\$0.00	\$0	\$0	
Passive additives purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0	
Other				#N/A	\$0.00	\$0	\$0	
						Annual pumping costs		\$0
Number of years of pump flooding	passive pit flooding	years	0					
						Total pumping costs		\$0
						Total		\$18,625
						% of Total		100%

Open Pit Name:		Goose Main			Pit # 4 4		
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs	Assumed	each	4	Sabina	\$75.00	\$300	\$300
Berm at crest	Estimated for continous berm with 1m diameter boulders, no spacing between boulders - 0.52 m3/m - assumed 50 % done during Operations	m3	494	RB1H	\$17.05	\$8,423	\$8,423
Block roads	Temporary gate installation to allow water monitoring. It includes decommissioning of gate when no longer required. Exposed area after gate has been decommissioned will be blocked with boulders (exposed area along with block of roads with boulders included in berm cost above)	allow	1	Sabina	\$5,000.00	\$5,000	\$5,000
Other				#N/A	\$0.00	\$0	\$0
STABILITY STUDY							
Conduct stability and setback study		allow	1	Sabina	\$10,000.00	\$10,000	\$10,000
STABILIZE SLOPES							
Off-load crest, soil A		m3		#N/A	\$0.00	\$0	\$0
Off-load crest, soil B		m3		#N/A	\$0.00	\$0	\$0
Doze/trim overburden at crest		m3		#N/A	\$0.00	\$0	\$0
Drill & blast pit crest		m3		#N/A	\$0.00	\$0	\$0
Buttress slope		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
COVER/CONTOUR SLOPES							
Place fill, soil A		m3		#N/A	\$0.00	\$0	\$0
Place fill, soil B		m3		#N/A	\$0.00	\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0	\$0
Vegetate slopes		ha		#N/A	\$0.00	\$0	\$0
Vegetate pit floor		ha		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
CONSTRUCT DIVERSION DITCHES							
Excavate ditches -soil		m3		#N/A	\$0.00	\$0	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0	\$0
CONSTRUCT SPILLWAY							
Excavate channel	100 m long, 6 m wide and 1 m deep	m3	600	SB1L	\$4.30	\$2,580	\$2,580
Concrete		m3		#N/A	\$0.00	\$0	\$0
Rip rap		m3	200	RR1L	\$13.50	\$2,700	\$2,700
Other	Geotextile	m2	300	GSTL	\$3.44	\$1,032	\$1,032
RECLAIM QUARRIES							
Contour slopes		m3		#N/A	\$0.00	\$0	\$0
Place overburden		m3		#N/A	\$0.00	\$0	\$0
Vegetate		m3		#N/A	\$0.00	\$0	\$0
FLOOD PIT-Captital							
Remove stationary equipment (sump pumps) and Pipeline	At closure, pump will be at top of TF and pipeline leads to WTP. Remove pipeline to closure landfill; dispose of fuel in diesel day tank and oil from pump and landfill cleaned pump.	m	4,325	Sabina	\$5.40	\$23,355	\$23,355
Remove dewatering pipeline		m		#N/A	\$0.00	\$0	\$0
Remove power lines		each		#N/A	\$0.00	\$0	\$0
Construct diversion ditches		m3		#N/A	\$0.00	\$0	\$0
-Ditch, mat'l A		m3		#N/A	\$0.00	\$0	\$0
-Ditch, mat'l B		m3		#N/A	\$0.00	\$0	\$0
Construct embankment/dam		m3		#N/A	\$0.00	\$0	\$0
Supply/install pump station		each		#N/A	\$0.00	\$0	\$0
Supply/install piping system		m		#N/A	\$0.00	\$0	\$0
Remove pump post-closure		each		#N/A	\$0.00	\$0	\$0
Remove pipeline post-closure		m		#N/A	\$0.00	\$0	\$0
FLOOD PIT-Annual Cost							
Operate pumps (power)		m3		#N/A	\$0.00	\$0	\$0
Maintain pump/pipeline		allow		#N/A	\$0.00	\$0	\$0
Labour:fuel management, comissioning/decom		\$/h		#N/A	\$0.00	\$0	\$0
Chemical addition, ____ kg/m3 of water		tonne		#N/A	\$0.00	\$0	\$0
Chemicals, purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0
Passive/biological additives		\$/ha		#N/A	\$0.00	\$0	\$0
Passive additives purchase and shipping		tonne		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
					Annual pumping costs		
Number of years of pump flooding	passive pit flooding	years	0				
					Total pumping costs		
					\$0	\$0	\$0
					Total	\$53,390	\$53,390
					% of Total		100%

Quarry Name:		Airstrip Quarry		Quarry #		1	1			
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	Total Cost			
CONTROL ACCESS										
Fence		m		#NA	\$0.00	\$0	\$0			
Signs		each		#NA	\$0.00	\$0	\$0			
Berm at crest		m3		RB1H	\$17.05	\$0	\$0			
Block roads		allow		#NA	\$0.00	\$0	\$0			
Other				#NA	\$0.00	\$0	\$0			
STABILITY STUDY										
Conduct stability and setback study	Not required for quarry	allow		#NA	\$0.00	\$0	\$0			
STABILIZE SLOPES										
Off-load crest, soil A		m3		#NA	\$0.00	\$0	\$0			
Off-load crest, soil B		m3		#NA	\$0.00	\$0	\$0			
Doze/trim overburden at crest		m3		#NA	\$0.00	\$0	\$0			
Drill & blast pit crest		m3		#NA	\$0.00	\$0	\$0			
Buttress slope		m3		#NA	\$0.00	\$0	\$0			
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	20 exc-sL		\$190.00	\$3,800	\$3,800			
COVER/CONTOUR SLOPES										
Place fill, soil A		m3		#NA	\$0.00	\$0	\$0			
Place fill, soil B		m3		#NA	\$0.00	\$0	\$0			
Rip rap		m3		#NA	\$0.00	\$0	\$0			
Vegetate slopes	Allow to revegetate naturally	ha		#NA	\$0.00	\$0	\$0			
Vegetate pit floor		ha		#NA	\$0.00	\$0	\$0			
Other				#NA	\$0.00	\$0	\$0			
CONSTRUCT DIVERSION DITCHES										
Excavate ditches -soil		m3		#NA	\$0.00	\$0	\$0			
Excavate ditches -rock		m3		#NA	\$0.00	\$0	\$0			
Rip rap in channel base		m3		#NA	\$0.00	\$0	\$0			
CONSTRUCT SPILLWAY										
Excavate channel	Not required. Quarry base will be graded for sheet drainage.	m3		SB1L	\$4.30	\$0	\$0			
Concrete		m3		#NA	\$0.00	\$0	\$0			
Rip rap		m3		RR1L	\$13.50	\$0	\$0			
Other		m2		GSTL	\$3.44	\$0	\$0			
RECLAIM QUARRIES										
Contour slopes	Quarry will not be flooded - development will occur below water level and the areas will be contoured to drain positively	m3		#NA	\$0.00	\$0	\$0			
Place overburden		m3		#NA	\$0.00	\$0	\$0			
Vegetate		m3		#NA	\$0.00	\$0	\$0			
FLOOD PIT-Capital										
Remove stationary equipment (sump pumps) and Pipeline		m		#NA	\$0.00	\$0	\$0			
Remove dewatering pipeline		m		#NA	\$0.00	\$0	\$0			
Remove power lines		each		#NA	\$0.00	\$0	\$0			
Construct diversion ditches		m3		#NA	\$0.00	\$0	\$0			
-Ditch, mat'l A		m3		#NA	\$0.00	\$0	\$0			
-Ditch, mat'l B		m3		#NA	\$0.00	\$0	\$0			
Construct embankment/dam		m3		#NA	\$0.00	\$0	\$0			
Supply/install pump station		each		#NA	\$0.00	\$0	\$0			
Supply/install piping system		m		#NA	\$0.00	\$0	\$0			
Remove pump post-closure		each		#NA	\$0.00	\$0	\$0			
Remove pipeline post-closure		m		#NA	\$0.00	\$0	\$0			
FLOOD PIT-Annual Cost										
Operate pumps (power)		m3		#NA	\$0.00	\$0	\$0			
Maintain pump/pipeline		allow		#NA	\$0.00	\$0	\$0			
Labour:fuel management, commissioning/decom		\$/h		#NA	\$0.00	\$0	\$0			
Chemical addition, ____ kg/m3 of water		tonne		#NA	\$0.00	\$0	\$0			
Chemicals, purchase and shipping		tonne		#NA	\$0.00	\$0	\$0			
Passive/biological additives		\$/ha		#NA	\$0.00	\$0	\$0			
Passive additives purchase and shipping		tonne		#NA	\$0.00	\$0	\$0			
Other				#NA	\$0.00	\$0	\$0			
						Annual pumping costs		\$0		
Number of years of pump flooding	No flooding	years	0					Total pumping costs	\$0	\$0
						Total		\$3,800	\$3,800	
						% of Total			100%	

4	Underground Mine Name Umwelt				UG Mine # 1		1
ACTIVITY/MATERIAL	Notes	Unit	Qty	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0
Backfill Portal (NPAG waste rock plug)	At least 5 m deep into 5x4.5m portal and slope at least 2:1 outside of portal	m3	150	PORL	\$18.80	\$2,820	\$2,820
Backfill portal #2		m3		#N/A	\$0.00	\$0	\$0
Cap raise # 1	Concrete plug over 4m-dia. vent raise	m3	28	SRH	\$2,132.00	\$60,336	\$60,336
Cap raise #2	Concrete plug over 4m-dia. vent raise	m3	28	SRH	\$2,132.00	\$60,336	\$60,336
Cap shaft #1	Concrete plug over 4m-dia. fresh air vent	m3	28	SRH	\$2,132.00	\$60,336	\$60,336
Cap shaft #2		m3		#N/A	\$0.00	\$0	\$0
Backfill adits		m3		#N/A	\$0.00	\$0	\$0
Backfill open stope		m3		#N/A	\$0.00	\$0	\$0
Concrete cap over open stope		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
REMOVE HAZARDOUS MATERIALS							
Remove hazardous materials, U/G labor	Two shifts with loader, incl. operator and fuel	manhour	20	load-s	\$175.00	\$3,500	\$3,500
Remove/decontam. stationary & elect. equip		mandays		#N/A	\$0.00	\$0	\$0
Remove/decontam. mobile equipment		each		#N/A	\$0.00	\$0	\$0
Remove misc. haz. mat & explosives	Dispose of up to 1 week's inventory of explosives	kg	100	Sabina	\$50.00	\$5,000	\$5,000
Decommission Pipeline	Clean Umwelt UG to SWP pipeline, decommission and landfill	m	1,200	Sabina	\$4.90	\$5,880	\$5,880
INSTALL BULKHEADS							
Bulkheads to control water flow		each		#N/A	\$0.00	\$0	\$0
Grout bulkhead		m3		#N/A	\$0.00	\$0	\$0
FLOOD MINE							
Supply/install pump	UG mine is expected to be flooded in Year 10 and active flooding will take about a year, relocation of pipelines and flooding will occur as part of operations but cost is provided as a conservative approach	each		#N/A	\$0.00	\$0	\$0
Relocate Pipeline	Move SWP-Llama UG pipeline discharge to Umwelt UG	m	800	Sabina	\$4.73	\$3,780	\$3,780
Operate pumps to flood workings		m3	763,134	Sabina	\$0.13	\$98,480	\$98,480
Decommission of pipeline				#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
INSTALL GROUNDWATER COLLECTION SYSTEM							
Excavate/install sumps		m2		#N/A	\$0.00	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0	\$0
SPECIALIZED ITEMS							
Install water quality monitoring pipes		each		#N/A	\$0.00	\$0	\$0
Install permanent pumping system		each		#N/A	\$0.00	\$0	\$0
Assess underground stability	Rock mechanics inspection before closure	each	1	Sabina	\$10,000.00	\$10,000	\$10,000
Total						\$310,467	\$310,467
% of Total							100%

Underground Mine Name Llama		UG Mine # 2			2		
ACTIVITY/MATERIAL	Notes	Unit	Qty	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0
Backfill Portal (NPAG waste rock plug)	At least 5 m deep into 5x4.5m portal and slope at least 2:1 outside of portal	m3	150	PORL	\$18.80	\$2,820	\$2,820
Backfill portal #2		m3		#N/A	\$0.00	\$0	\$0
Cap raise # 1	Concrete plug over 4m-dia. vent raise	LS	28	SRH	\$2,132.00	\$60,336	\$60,336
Cap raise #2		m3		#N/A	\$0.00	\$0	\$0
Cap shaft #1		m3		#N/A	\$0.00	\$0	\$0
Cap shaft #2		m3		#N/A	\$0.00	\$0	\$0
Backfill adits		m3		#N/A	\$0.00	\$0	\$0
Backfill open stope		m3		#N/A	\$0.00	\$0	\$0
Concrete cap over open stope		m3		#N/A	\$0.00	\$0	\$0
Other							
REMOVE HAZARDOUS MATERIALS							
Remove hazardous materials, U/G labor	Two shifts with loader, incl. operator and fuel	manhour	20	load-s	\$175.00	\$3,500	\$3,500
Remove/decontam. stationary & elect. equip		mandays		#N/A	\$0.00	\$0	\$0
Remove/decontam. mobile equipment		each		#N/A	\$0.00	\$0	\$0
Remove misc. haz. mat & explosives	Mining will cease before closure	kg		#N/A	\$0.00	\$0	\$0
Decommission Pipeline	Clean Llama UG to SWP pipeline, decommission and landfill	m	2700	Sabina	\$4.90	\$13,230	\$13,230
INSTALL BULKHEADS							
Bulkheads to control water flow		each		#N/A	\$0.00	\$0	\$0
Grout bulkhead		m3		#N/A	\$0.00	\$0	\$0
FLOOD MINE							
Supply/install pump	UG mine is expected to be flooded in Year 5 and active flooding will take about a year, relocation of pipelines and flooding will occur as part of operations	each		#N/A	\$0.00	\$0	\$0
Supply/install piping system		m		#N/A	\$0.00	\$0	\$0
Operate pumps to flood workings		m3		#N/A	\$0.00	\$0	\$0
Decommission of pipelines				#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
INSTALL GROUNDWATER COLLECTION SYSTEM							
Excavate/install sumps		m2		#N/A	\$0.00	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0	\$0
SPECIALIZED ITEMS							
Install water quality monitoring pipes		each		#N/A	\$0.00	\$0	\$0
Install permanent pumping system		each		#N/A	\$0.00	\$0	\$0
Assess underground stability	Rock mechanics inspection before closure	each	1	Sabina	\$10,000.00	\$10,000	\$10,000
					Total	\$89,886	\$89,886
					% of Total		100%

Underground Mine Name	Goose Main	UG Mine # 3	3				
ACTIVITY/MATERIAL	Notes	Unit	Qty	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0
Backfill Portal (NPAG waste rock plug)	At least 5 m deep into 5x4.5m portal and slope at least 2:1 outside of portal	m3	150	PORL	\$18.80	\$2,820	\$2,820
Backfill portal #2		m3		#N/A	\$0.00	\$0	\$0
Cap raise # 1	Concrete plug over 4m-dia. vent raise	LS	28	SRH	\$2,132.00	\$60,336	\$60,336
Cap raise #2		m3		#N/A	\$0.00	\$0	\$0
Cap shaft #1		m3		#N/A	\$0.00	\$0	\$0
Cap shaft #2		m3		#N/A	\$0.00	\$0	\$0
Backfill adits		m3		#N/A	\$0.00	\$0	\$0
Backfill open stope		m3		#N/A	\$0.00	\$0	\$0
Concrete cap over open stope		m3		#N/A	\$0.00	\$0	\$0
Other							
REMOVE HAZARDOUS MATERIALS							
Remove hazardous materials, U/G labor	Two shifts with loader, incl. operator and fuel	manhour	20	load-s	\$175.00	\$3,500	\$3,500
Remove/decontam. stationary & elect. equip		mandays		#N/A	\$0.00	\$0	\$0
Remove/decontam. mobile equipment		each		#N/A	\$0.00	\$0	\$0
Remove misc. haz. mat & explosives	Mining will cease before closure	kg		#N/A	\$0.00	\$0	\$0
Decommission WTP - Goose Lake Pipeline	In Water Management tab	m		#N/A	\$0.00	\$0	\$0
INSTALL BULKHEADS							
Bulkheads to control water flow		each		#N/A	\$0.00	\$0	\$0
Grout bulkhead		m3		#N/A	\$0.00	\$0	\$0
FLOOD MINE							
Supply/install pump	UG mine is expected to be flooded in Year 10 and active flooding will take about a year, relocation of pipelines and flooding will occur as progressive reclamation but cost is provided as a conservative approach	each		#N/A	\$0.00	\$0	\$0
Supply/install piping system	Adjust pipe line to route to Goose UG in Year 10	m	4,500	Sabina	\$3.91	\$17,575	\$17,575
Operate pumps to flood workings		m3	391,630	Sabina	\$0.13	\$52,259	\$52,259
Decommission SWP to Goose UG pipeline		m	10,800	#N/A	\$1.90	\$20,520	\$20,520
Other				#N/A	\$0.00	\$0	\$0
INSTALL GROUNDWATER COLLECTION SYSTEM							
Excavate/install sumps		m2		#N/A	\$0.00	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0	\$0
SPECIALIZED ITEMS							
Install water quality monitoring pipes		each		#N/A	\$0.00	\$0	\$0
Install permanent pumping system		each		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
Total						\$157,010	\$157,010
% of Total							100%

Underground Mine Name	Echo			UG Mine # 4	4		
ACTIVITY/MATERIAL	Notes	Unit	Qty	Cost Code	Unit Cost	Cost	Total Cost
CONTROL ACCESS							
Fence		m		#N/A	\$0.00	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0
Backfill Portal (NPAG waste rock plug)	At least 5 m deep into 5x4.5m portal and slope at least 2:1 outside of portal	m3	150	PORL	\$18.80	\$2,820	\$2,820
Backfill portal #2		m3		#N/A	\$0.00	\$0	\$0
Cap raise # 1	Concrete plug over 4m-dia. vent raise	LS	28	SRH	\$2,132.00	\$60,336	\$60,336
Cap raise #2		m3		#N/A	\$0.00	\$0	\$0
Cap shaft #1		m3		#N/A	\$0.00	\$0	\$0
Cap shaft #2		m3		#N/A	\$0.00	\$0	\$0
Backfill adits		m3		#N/A	\$0.00	\$0	\$0
Backfill open stope		m3	3,550	Sabina	\$6.00	\$21,300	\$21,300
Concrete cap over open stope		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
REMOVE HAZARDOUS MATERIALS							
Remove hazardous materials, U/G labor	One shift with loader, incl. operator and fuel	manhour	10	load-s	\$175.00	\$1,750	\$1,750
Remove/decontam. stationary & elect. equip		mandays		#N/A	\$0.00	\$0	\$0
Remove/decontam. mobile equipment		each		#N/A	\$0.00	\$0	\$0
Remove misc. haz. mat & explosives	Mining will cease before closure	kg		#N/A	\$0.00	\$0	\$0
Decommission Pipeline		m		#N/A	\$0.00	\$0	\$0
INSTALL BULKHEADS							
Bulkheads to control water flow		each		#N/A	\$0.00	\$0	\$0
Grout bulkhead		m3		#N/A	\$0.00	\$0	\$0
FLOOD MINE							
Supply/install pump	Passive flooding of Echo UG in Year 10, complete flooding is expected to occur within a few months.	each		#N/A	\$0.00	\$0	\$0
Supply/install piping system		each		#N/A	\$0.00	\$0	\$0
Operate pumps to flood workings		m3		#N/A	\$0.00	\$0	\$0
Decommission				#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
INSTALL GROUNDWATER COLLECTION SYSTEM							
Excavate/install sumps		m2		#N/A	\$0.00	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0	\$0
SPECIALIZED ITEMS							
Install water quality monitoring pipes		each		#N/A	\$0.00	\$0	\$0
Install permanent pumping system		each		#N/A	\$0.00	\$0	\$0
Assess underground stability	Rock mechanics inspection before closure	each	1	Sabina	\$10,000.00	\$10,000	\$10,000
					Total	\$96,206	\$96,206
					% of Total		100%

1 Tailings Impoundment Name:

TSF

Pond # 1

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost %	Land Cost	Total Cost
CONTROL ACCESS								
Fence		m		#N/A	\$0.00	\$0	\$0	\$0
Signs		each		#N/A	\$0.00	\$0	\$0	\$0
Berm		m3		#N/A	\$0.00	\$0	\$0	\$0
Block roads		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
STABILIZE EMBANKMENT(S)								
Toe buttress, drainage layer		m3		#N/A	\$0.00	\$0	\$0	\$0
Toe buttress, bulk fill		m3		#N/A	\$0.00	\$0	\$0	\$0
Rip rap		m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0	\$0
Raise crest		m3		#N/A	\$0.00	\$0	\$0	\$0
Flatten slopes		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
COVER TAILINGS								
Grade/shape tailings surface		m3		#N/A	\$0.00	\$0	\$0	\$0
Liner bedding		m3		#N/A	\$0.00	\$0	\$0	\$0
Subgrade preparation - compact		m2		#N/A	\$0.00	\$0	\$0	\$0
Supply geotextile/geosynthetic		m2		#N/A	\$0.00	\$0	\$0	\$0
Install geotextile/geosynthetic		m2		#N/A	\$0.00	\$0	\$0	\$0
Soil cover		m3		#N/A	\$0.00	\$0	\$0	\$0
Rock cover	Included in the quantity for waste rock pile cover (5m of NPAG). See Rock Pile tab.	m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		m2		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
BURY PAG ROCK								
Relocate PAG rock		m3		#N/A	\$0.00	\$0	\$0	\$0
Place cover over PAG rock		m3		#N/A	\$0.00	\$0	\$0	\$0
Raise crest of dam		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
STABILIZE DECANT SYSTEM								
Excavate and replace		m3		#N/A	\$0.00	\$0	\$0	\$0
Plug/backfill with concrete or clay		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
REMOVE TAILINGS DISCHARGE								
Cyclones		m3		#N/A	\$0.00	\$0	\$0	\$0
Pipe		m3		#N/A	\$0.00	\$0	\$0	\$0
Remove reclaim barge		allow		#N/A	\$0.00	\$0	\$0	\$0
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	\$0.00	\$0	\$0	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0	\$0	\$0
Rip rap in channel base (liner)		m2		#N/A	\$0.00	\$0	\$0	\$0
FLOOD TAILINGS								
Doze tailings to final contour		m3		#N/A	\$0.00	\$0	\$0	\$0
Raise crest of dam		m3		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
UPGRADE SPILLWAY								
Excavate channel on TSF	Breach west end of dam to existing drainage reporting to Goose Main Pit; 100 m channel.	m3	11,000.0	Sabina	\$7.30	\$80,300	\$0	\$80,300
Excavate channel, soil		m3		#N/A	\$0.00	\$0	\$0	\$0
Concrete		m3		#N/A	\$0.00	\$0	\$0	\$0
Rip rap		m3	7,000	RR1L	\$13.50	\$94,500	\$0	\$94,500
Other	Geotextile	m2	2,860	GSTL	\$3.44	\$9,838	\$0	\$9,838
CONSTRUCT SEEPAGE COLLECTION POND								
Excavate seepage collection pond		m3		#N/A	\$0.00	\$0	\$0	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0	\$0	\$0
Bedding layer		m3		#N/A	\$0.00	\$0	\$0	\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0	\$0	\$0
Install geomembrane		m2		#N/A	\$0.00	\$0	\$0	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0	\$0	\$0
Breach seepage diversion berm		m3	285	Sabina	\$7.30	\$2,081	\$0	\$2,081
INSTALL GROUNDWATER COLLECTION SYSTEM								
Excavate/install sumps		m3		#N/A	\$0.00	\$0	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0	\$0	\$0
SPECIALIZED ITEMS								
Install permanent instrumentation, supply & technician		each		#N/A	\$0.00	\$0	\$0	\$0
Install permanent instrumentation, drilling		each		#N/A	\$0.00	\$0	\$0	\$0
TREAT SEEPAGE - see "Water Management" and "Water Treatment"								
TREAT SUPERNATANT								
Pump water (to pit, U/G)		m3		#N/A	\$0.00	\$0	\$0	\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$0	\$0	\$0
Supply reagents		tonne		#N/A	\$0.00	\$0	\$0	\$0
						Annual treatment costs	\$0	
Number of years of treatment		years	0			Total treatment costs	\$0	\$0
						Total	\$186,719	\$0 \$186,719
						% of Total	0%	100%

* for construction of passive treatment system refer to "Water Management"

1 Rock Pile Name: Umwelt, Llama, Echo and TSF

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	Total Cost
STABILIZE SLOPES							
Flatten slopes with dozer		m3		#N/A	\$0.00	\$0	\$0
Flatten "bubble dump" areas		m3		#N/A	\$0.00	\$0	\$0
Divert runoff, ditch mat'l A		m3		#N/A	\$0.00	\$0	\$0
Divert runoff, ditch mat'l B		m3		#N/A	\$0.00	\$0	\$0
Toe buttress, drain mat'l		m3		#N/A	\$0.00	\$0	\$0
Toe buttress, fill mat'l A		m3		#N/A	\$0.00	\$0	\$0
Toe buttress, fill mat'l B		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
COVER ROCK PILE							
Subgrade preparation - doze surface		m3		#N/A	\$0.00	\$0	\$0
Soil cover - excavate,haul,spread&compact		m3		#N/A	\$0.00	\$0	\$0
Rock cover - excavate,haul & spread	Cover 4 rock piles: Umwelt, Llama, Echo and TSF. Note all WRSAs will be covered progressively by direct hauling NPAG during mining; however Sabina is assuming that 48 ha will still require covering at Closure.	m3	2,400,000	Sabina	\$6.00	\$14,400,000	\$14,400,000
Excavate downslope drainage channel & chute		m3		#N/A	\$0.00	\$0	\$0
Rip rap drainage channel and chute		m3		#N/A	\$0.00	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
VERY LOW PERMEABILITY COVER (in addition to above)							
Liner subgrade preparation - compact		m2		#N/A	\$0.00	\$0	\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0	\$0
Install geomembrane		m2		#N/A	\$0.00	\$0	\$0
Protective cover - excavate,haul,spread&compact		m3		#N/A	\$0.00	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0
Install infiltration/seepage instrumentation		allow		#N/A	\$0.00	\$0	\$0
CONSTRUCT DIVERSION DITCHES							
Excavate ditches -soil		m3		#N/A	\$0.00	\$0	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0	\$0
CONSTRUCT SEEPAGE COLLECTION POND							
Excavate seepage collection pond	See Water Management tab for berm breaching	m3		#N/A	\$0.00	\$0	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0	\$0
Bedding layer		m3		#N/A	\$0.00	\$0	\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0	\$0
Install geomembrane		m2		#N/A	\$0.00	\$0	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0	\$0
INSTALL GROUNDWATER COLLECTION SYSTEM							
Excavate/install sumps		m3		#N/A	\$0.00	\$0	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0	\$0
Install pumps/pipelines/power supply		allow		#N/A	\$0.00	\$0	\$0
RELOCATE DUMPS							
Load, haul, dump or doze		m3		#N/A	\$0.00	\$0	\$0
Add lime		tonne		#N/A	\$0.00	\$0	\$0
Contour reclaimed area		ha		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
SPECIALIZED ITEMS							
Install ground temperature monitoring cable	Will be installed during Operations to meet operational monitoring commitments	each		#N/A	\$0.00	\$0	\$0
Install permanent instrumentation, drilling		each		#N/A	\$0.00	\$0	\$0
TREAT ROCK PILE SEEPAGE - see "Water Management"							
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox							
Cyanide destruction water treatment pumping		m3		#N/A	\$0.00	\$0	\$0
Reagents		tonnes		#N/A	\$0.00	\$0	\$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	\$0.00	\$0	\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$0	\$0
						Annual treatment costs	\$0
Number of years of treatment		years	0			Total treatment costs	\$0
HEAP LEACH SEEPAGE TREATMENT - ARD/ML							
Upgrade/modify pumping system - report to WTP		allow		#N/A	\$0.00	\$0	\$0
						Total	\$14,400,000 \$14,400,000
						% of Total	100%

* For construction of passive treatment system refer to "Water Management".

1

Building / Equip Name:

Bldg / Equip #: 1

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost Total Cost	
DISPOSE MOBILE EQUIPMENT							
Decontaminate and ship off-site		allow		#N/A	\$0.00	\$0	\$0
Decontaminate and dispose on-site	Drive or transport to landfill; drain fluids; NPAG cover cost below	allow	1	Sabina	\$20,000.00	\$20,000	\$20,000
Other				#N/A	\$0.00	\$0	\$0
REMOVE BUILDINGS - see note below							
Accommodation Complex	Goose Admin: Kitchen/camp. Landfill building materials and pad	m2	1,980	BRS1L	\$45.00	\$89,100	\$89,100
Process Facilities		m2	6,464	BRS1H	\$65.00	\$420,160	\$420,160
Crusher		m2	1,630	BRS1H	\$65.00	\$105,950	\$105,950
Power plant		m2	2,040	BRS1H	\$65.00	\$132,600	\$132,600
Emergency power plant		m2	300	BRS1H	\$65.00	\$19,500	\$19,500
Truck Shop/Office	Goose Admin building	m2	2,349	BRS1L	\$45.00	\$105,725	\$105,725
Cold storage	Goose Admin building	m2	840	BRS1L	\$45.00	\$37,800	\$37,800
Storage Facilities	Waste oil storage Goose Site	Lot	1	Sabina	\$43,333.33	\$43,333	\$43,333
Storage Facility	Goose freight storage	Lot	1	Sabina	\$19,250.00	\$19,250	\$19,250
Water and Wastewater Treatment Facilities	Water treatment plant Goose Building	m2	647	BRS1L	\$45.00	\$29,115	\$29,115
Sewage Treatment Plant	Remove hazardous materials and dispose of at licensed facility, landfill building materials	Lot	1	Sabina	\$11,550.00	\$11,550	\$11,550
Fuel Tanks	Fuel storage and distribution Goose facility	Lot	1	Sabina	\$154,000.00	\$154,000	\$154,000
Offices, Repair, Lab, Warehouse	MLA infrastructure Port Office	Units	5	Sabina	\$2,340.00	\$11,700	\$11,700
Pipeline	MLA Infrastructure	m	10,000	Sabina	\$3.90	\$39,000	\$39,000
Warehouse, Shops and Others	MLA Infrastructure. Includes: Incinerator and waste management, Warehouses, Genset, Maintenance shop, water storage, WTP/STP, camp/office, freight storage area, waste area, fuel storage. Cost includes grade and contour pads, disposal at designated areas, remove hazard material when applicable.	LS	1	Sabina	\$308,683.33	\$308,683	\$308,683
Freshwater intakes	pipes will be capped at substrate and left in place.	m2		#N/A	\$0.00	\$0	\$0
Reclaim pumps		m2		#N/A	\$0.00	\$0	\$0
Outfall & Diffuser		m2		#N/A	\$0.00	\$0	\$0
Airstrip lighting, navigation, electrician		manhours	20	elecH	\$95.00	\$1,900	\$1,900
Airstrip lighting, navigation, mechanical		manhours	20	mechH	\$72.85	\$1,457	\$1,457
Break foundation slabs		m2		#N/A	\$0.00	\$0	\$0
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
LANDFILL FOR DEMOLITION WASTE							
Place rock cover		m3	25,000	Sabina	\$6.00	\$150,000	\$150,000
Place soil cover		m3		#N/A	\$0.00	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0
GRADE AND CONTOUR PADS							
Accommodation Complex	Goose Admin: Kitchen/camp. no concrete foundation	ha	0.2	SCFYL	\$4,300.00	\$860	\$860
Process Facilities	concrete foundation demolished to ground level	m2	6,464	BRCS	\$6.00	\$38,784	\$38,784
Crusher	concrete foundation demolished to ground level	m2	1,630	BRCS	\$6.00	\$9,780	\$9,780
Power plant	no concrete foundation	ha	0.3	SCFYL	\$4,300.00	\$1,290	\$1,290
Emergency power plant	no concrete foundation	ha	0.10	SCFYL	\$4,300.00	\$430	\$430
Truck Shop/Office	concrete foundation demolished to ground level	m2	2,349	BRCS	\$6.00	\$14,097	\$14,097
Cold storage	no concrete foundation	ha	0.1	SCFYL	\$4,300.00	\$430	\$430
Water and Wastewater Treatment Facilities	no concrete foundation	ha	0.1	SCFYL	\$4,300.00	\$430	\$430
Sewage Treatment Plant	no concrete foundation	m2	33	BRCS	\$6.00	\$198	\$198
Fuel Tanks	Fuel storage and distribution Goose facility; no concrete foundation	ha	2.2	SCFYL	\$4,300.00	\$9,460	\$9,460
Warehouse, Shops and Other	MLA, includes all storage/laydown, Fuel Tanks and camp area	ha	20	SCFYL	\$4,300.00	\$86,000	\$86,000
Place rock cover		m3		#N/A	\$0.00	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0
PUNCTURE LINED SUMPS							
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0	\$0
RECLAIM ROADS							
Restore drainage, remove culverts haul road	Restore drainage including culverts; Roads will remain intact to facilitate long-term access.	m3	1,488	Sabina	\$11.00	\$16,368	\$16,368
Remove bridges		each		#N/A	\$0.00	\$0	\$0
Scarify and install water breaks		ha		#N/A	\$0.00	\$0	\$0
Restore drainage airstrip		m3	1,020	Sabina	\$12.00	\$12,240	\$12,240
Scarify laydown areas		ha		#N/A	\$0.00	\$0	\$0
Scarify Winter Ice Roads	Fill sections on land - 8 km x 10 m wide = 8.0 ha	ha	8	SCFYH	\$6,030.00	\$48,240	\$48,240
Vegetate		ha		#N/A	\$0.00	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0
SPECIALIZED ITEMS							
Dispose of misc. debris and laydown area refuse				#N/A	\$0.00	\$0	\$0
					Total	\$1,939,431	\$1,939,431
					% of Total		100%

1 Chemicals/Soil Area Name:

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost Total Cost	
HAZARDOUS MATERIALS AUDIT							
Hazardous materials audit		mandays		#/N/A	\$0.00	\$0	\$0
Phase 1 audit		each	1	CS1L	\$7,500.00	\$7,500	\$7,500
Phase 2 audit		each	1	CS2L	\$50,000.00	\$50,000	\$50,000
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS							
Environmental technician/coordinator		mandays		#/N/A	\$0.00	\$0	\$0
Decontaminate: oil, fuel		mandays		#/N/A	\$0.00	\$0	\$0
Decontaminate maintenance shop		mandays		#/N/A	\$0.00	\$0	\$0
Decontaminate power plant		mandays		#/N/A	\$0.00	\$0	\$0
Decontaminate bulk fuel storage		mandays		#/N/A	\$0.00	\$0	\$0
Decontaminate ANFO plant		mandays		#/N/A	\$0.00	\$0	\$0
Decontaminate offices/warehouse/accom		mandays		#/N/A	\$0.00	\$0	\$0
Removal of asbestos siding on buildings		m2		#/N/A	\$0.00	\$0	\$0
Removal of friable asbestos on equipment		m2		#/N/A	\$0.00	\$0	\$0
Other				#/N/A	\$0.00	\$0	\$0
HAZARDOUS MATERIALS REMOVAL							
Waste oils	Consume in a waste oil burner on-site	litre	10,000	ORL	\$0.43	\$4,300	\$4,300
Waste fuel	Consume on-site to power an incinerator, or in a waste oil burner	litre	250,000	ORL	\$0.43	\$107,500	\$107,500
Waste batteries	Assumed 10 20-kg batteries generated in the final year of closure	kg	200	PCRH	\$2.50	\$500	\$500
Assay & environmental lab reagents		kg	500	PCRH	\$2.50	\$1,250	\$1,250
Machine shop paints, solvents etc		litre	200	PCRH	\$2.50	\$500	\$500
Glycol		litre	5,000	PCRH	\$2.50	\$12,500	\$12,500
Process reagents		kg	130,000	PCRH	\$2.50	\$325,000	\$325,000
WTP sludge from Water Treatment	Assumes off-site disposal for 7 years of treatment. If sludge passes leach tests, will consider on-site disposal.	kg	21,000	PCRH	\$2.50	\$52,500	\$52,500
Nuclear sources		allow		#/N/A	\$0.00	\$0	\$0
Mobile Equipment	Remove hazardous waste from equipment not being salvaged, clean, landfill equipment	each	41	Sabina	\$2,280.00	\$93,480	\$93,480
HAZARDOUS MATERIALS							
Transportation to disposal facility	Included in hazardous materials removal cost	allow		#/N/A	\$0.00	\$0	\$0
Disposal fees	Included in hazardous materials removal cost	allow		#/N/A	\$0.00	\$0	\$0
Other				#/N/A	\$0.00	\$0	\$0
CONTAMINATED SOILS							
Contam. soil investigation - Phase 1		each		#/N/A	\$0.00	\$0	\$0
Contam. soil investigation - Phase 2		LS	1	Sabina	\$50,000.00	\$50,000	\$50,000
CONTAMINATED SOIL REMOVAL							
Excavate and transport to onsite facility		m3	10,000	SB1H	\$5.90	\$59,000	\$59,000
Manage hydrocarbon remediation at facility	Operate landfarms	m3	10,000	CSRL	\$47.00	\$470,000	\$470,000
Reagents/stabilizing agent		m2		#/N/A	\$0.00	\$0	\$0
Excavate and transport to offsite facility		m3		#/N/A	\$0.00	\$0	\$0
Contour decontaminated area	Decommission 2 landfarms and confirmation soil sampling; estimated 6,000m3 at each of Goose and MLA sites.	m3	12,000	SB1L	\$4.30	\$51,600	\$51,600
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER							
Supply geomembrane, HDPE, ES3, GCL		m2		#/N/A	\$0.00	\$0	\$0
Upper and lower bedding layers		m3		#/N/A	\$0.00	\$0	\$0
Install geomembrane, HDPE, ES3, GCL		m2		#/N/A	\$0.00	\$0	\$0
Erosion protection layer		m3		#/N/A	\$0.00	\$0	\$0
Vegetate		m2		#/N/A	\$0.00	\$0	\$0
Install infiltration/seepage instrumentation		allow		#/N/A	\$0.00	\$0	\$0
Other	Construct landfarm 1 at Goose, 1 at MLA	allow	2	Sabina	\$50,000.00	\$100,000	\$100,000
OTHER							
				#/N/A	\$0.00	\$0	\$0
					Total	\$1,385,630	\$1,385,630
					% of Total		100%

1 Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
BREACH DYKE EMBANKMENT						
Breach Llana Lake Diversion Berms		m3	665	#N/A	\$7.30	\$4,855
Breach Llana WRSA Diversion Berm		m3	95	#N/A	\$7.30	\$694
Breach Llana WRSA Containment Dam		m3	95	#N/A	\$7.30	\$694
Breach Primary Pond Containment Dam	Breach in Year 2 once Umwelt Pit mining complete and starts as Umwelt Tailings Facility (TF); Primary Pond will water will gravity flow directly.	m3		#N/A	\$0.00	\$0
Breach Umwelt WRSA Containment Dam		m3	120	#N/A	\$7.30	\$876
Breach Umwelt WRSA Diversion Berm		m3	95	#N/A	\$7.30	\$694
Breach Echo WRSA Containment Dam		m3	190	#N/A	\$7.30	\$1,387
Breach Echo Diversion Berm (East and West)		m3	190	#N/A	\$7.30	\$1,387
Breach Echo WRSA Diversion Berm		m3	95	#N/A	\$7.30	\$694
Breach East Echo Containment Dam		m3	95	#N/A	\$7.30	\$694
Breach Goose Main Diversion Berm		m3	95	#N/A	\$7.30	\$694
Breach Ore Stockpile Diversion Berm and Containment Dam		m3	215	#N/A	\$7.30	\$1,570
Breach SWP Diversion Berms and Containment Dams		m3	430	#N/A	\$8.00	\$3,440
Remove Liner from all berms	Remove liner from all berms	m2	30,700	Sabina	\$0.70	\$21,490
Contour water intake area		m3		#N/A	\$0.00	\$0
STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS						
Place soil cover		m3		#N/A	\$0.00	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0
Rip rap in channel base		each		#N/A	\$0.00	\$0
REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES						
Excavate ditches -soil		m3		#N/A	\$0.00	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0
Stabilize side slopes		m3		#N/A	\$0.00	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0
BREACH DITCHES						
Excavate breaches		m3		#N/A	\$0.00	\$0
Install flow dissipation		m3		#N/A	\$0.00	\$0
Vegetate remainder of ditch		m2		#N/A	\$0.00	\$0
DECOMMISSION FRESH WATER SUPPLY						
Breach embankment		m3		#N/A	\$0.00	\$0
Remove pump		LS		#N/A	\$0.00	\$0
Remove pipelines		m		#N/A	\$0.00	\$0
DECOMMISSION WATER RECLAIM BARGE						
Decomission reclaim barge from Goose Main TF		LS	1	Sabina	\$10,000.00	\$10,000
WATER CONTROL IN RECLAMATION QUARRY						
Install pumping system		LS		#N/A	\$0.00	\$0
Remove pumping system		m		#N/A	\$0.00	\$0
REMOVE PIPELINES						
Decommission Llana pump and pipeline		m	700	Sabina	\$6.36	\$4,450
Decommission WTP-Goose Lake pipeline		m	1,140	Sabina	\$5.42	\$6,175
Remove Umwelt Pond pump and pipeline		m	950	Sabina	\$6.10	\$5,795
Remove Primary Pond pump and pipeline		m	7,250	Sabina	\$3.49	\$25,325
Remove Echo WRSA Pond pump and pipeline		m	2,400	Sabina	\$3.10	\$7,440
Remove Echo NCW pond pump and pipeline		m	220	Sabina	\$8.28	\$1,822
Remove Ore Stockpile pump and pipeline		m	4,550	Sabina	\$3.10	\$14,105
Decommission WTP pump and pipeline		m	7,520	Sabina	\$4.60	\$34,581
Decommission WTP		LS	1	Sabina	\$9,750.00	\$9,750
Concrete plug deep pipes		m3		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
GROUNDWATER COLLECTION SYSTEM						
Excavate/install sumps		m3		#N/A	\$0.00	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0
CONSTRUCT CONTAMINATED WATER STORAGE POND						
Excavate pond		m3		#N/A	\$0.00	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0
Bedding layer		m3		#N/A	\$0.00	\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0
Install geomembrane		m2		#N/A	\$0.00	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0
CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)						
Construct access roads		km		#N/A	\$0.00	\$0
Install HDPE piping system from collection pond		m		#N/A	\$0.00	\$0
Inter-cell flow structures		allow		#N/A	\$0.00	\$0
Install liners		m2		#N/A	\$0.00	\$0
Install growth media		m3		#N/A	\$0.00	\$0
Wetland vegetation		ha		#N/A	\$0.00	\$0
CONSTRUCT WATER TREATMENT PLANT						
Build treatment plant	Treatment Plant will be constructed as part of operations	LS		#N/A	\$0.00	\$0
Build sludge containment facility		LS		#N/A	\$0.00	\$0
				Total		\$158,608

For details of long-term/post-closure water treatment see "WATER TREATMENT" Worksheet"; costs included in this tab.

1 Post Closure Water Treatment - Identified as long term/post-closure in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
ADDITION OF REAGENTS TO WTP						
H2O2		kg		#N/A	\$0.00	\$0
lime		kg		#N/A	\$0.00	\$0
ferric sulphate		kg		#N/A	\$0.00	\$0
ferrous sulphate		kg		#N/A	\$0.00	\$0
flocculents		kg		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
LABOUR AND SUPPLIES						
Annual fuel		litres		#N/A	\$0.00	\$0
Annual power		kW-h		#N/A	\$0.00	\$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	\$0.00	\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$0
Misc. supplies, hoses, tools		allow		#N/A	\$0.00	\$0
Communications		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
WATER MANAGEMENT						
Pump from Goose Main TF to WTP	7.5 Mm3 for treatment in total	m3	1,071,429	POCL	\$0.12	\$128,571
Treat water from Goose Main TF in WTP		m3	1,071,429	TPOL	\$0.35	\$375,000
Pump from WTP recirc. into Goose Main TF		m3	1,071,429	POCL	\$0.12	\$128,571
WTP WATER SAMPLING AND ANALYSES						
Sampling equipment		allow		#N/A	\$0.00	\$0
Analyses		allow		#N/A	\$0.00	\$0
Shipping to laboratory		allow		#N/A	\$0.00	\$0
Reporting		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SITE ACCESS						
Road maintenance (incl. snow removal)		allow		#N/A	\$0.00	\$0
Winter road tariff		allow		#N/A	\$0.00	\$0
Truck rental		allow		#N/A	\$0.00	\$0
Air support		allow		#N/A	\$0.00	\$0
					Annual water treatment costs	\$632,143
Number of years of water treatment		years	7			Total \$4,425,002

1 Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost	
INTERIM CARE & MAINTENANCE							
Camp operation	Caretaker and summer personnel	mandays	306	Sabina	110	\$33,660	
On-site staff	Caretaker and summer personnel	manhours	1,440	ENVCO	74.16	\$106,790	
extra personnel		manmonths		#N/A	0	\$0	
-electrician		manmonths		#N/A	0	\$0	
-mechanic		manmonths		#N/A	0	\$0	
annual fuel	Fuel for vehicles; fuel for pumping included in water treatment cost	litre	5,000	FCDH	1.39	\$6,950	
misc. supplies		allow	1	Sabina	20000	\$20,000	
pick-up truck		each		#N/A	0	\$0	
small dozer		allow		#N/A	0	\$0	
small excavator		allow		#N/A	0	\$0	
snow machine		allow		#N/A	0	\$0	
communications		allow		#N/A	0	\$0	
SNP/AEMP water sampling & reporting	Sampling and lab costs	each	1	WSH	10000	\$10,000	
geotechnical assessment	Annual geotechnical inspection	each	1	RPTH	20000	\$20,000	
interim water treatment	Captured under Water Treatment	each	1	#N/A	0	\$0	
other		each		#N/A	0	\$0	
						Annual Interim C&M Cost	\$197,400
Number of years of ICM		years	3			Total	\$592,201

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**7 Years
(Year 11 to 17)**

ACTIVITY/MATERIAL - WATER TREATMENT	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
MONITORING & INSPECTIONS						
Total geotechnical inspections (1 yearly)		year	-	#N/A	\$0.00	\$0
Waste Rock Piles		year		#N/A	\$0.00	\$0
Pit Walls		year		#N/A	\$0.00	\$0
WR GTC Monitoring		year		#N/A	\$0.00	\$0
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs		year		#N/A	\$0.00	\$0
Site water monitoring		each		#N/A	\$0.00	\$0
- Active closure and flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)		year		#N/A	\$0.00	\$0
Terrestrial Animal Monitoring		year		#N/A	\$0.00	\$0
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Maintain gravel road surface		each		#N/A	\$0.00	\$0
Maintain airstrip surface		each		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"	Treatment for Closure Period (7 years)	LS	1	#N/A	\$632,143	\$632,143
Subtotal, Annual post-closure costs						\$632,143
Discount rate for calculation of net present value of post-closure cost, %					3.00%	
Number of years of post-closure activity					7	years
Present Value of payment stream						\$3,938,430
Combined NPV of payment stream						\$5,565,651

**8 Years
(Year 11 to 18)**

ACTIVITY/MATERIAL - GEOTECHNICAL INSPECTIONS OF TSF	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
MONITORING & INSPECTIONS						
Total geotechnical inspections (1 yearly)	Annual inspection of the TSF from Closure until embankment breaching in Year 18 (8 years).	year	1	RPTH	\$20,000.00	\$20,000
Waste Rock Piles		year		#N/A	\$0.00	\$0
Pit Walls		year		#N/A	\$0.00	\$0
WR GTC Monitoring		year		#N/A	\$0.00	\$0
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs		year		#N/A	\$0.00	\$0
Site water monitoring		each		#N/A	\$0.00	\$0
- Active closure and flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)		year		#N/A	\$0.00	\$0
Terrestrial Animal Monitoring		year		#N/A	\$0.00	\$0
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Maintain gravel road surface		each		#N/A	\$0.00	\$0
Maintain airstrip surface		each		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"		LS		#N/A	\$0.00	\$0
Subtotal, Annual post-closure costs						\$20,000
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				8	years	
Present Value of payment stream						\$140,394

**10 Years
(Year 11 to 20)**

ACTIVITY/MATERIAL - WEMP and TERRESTRIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
MONITORING & INSPECTIONS						
Total geotechnical inspections (1 yearly)		year		#N/A	\$0.00	\$0
Waste Rock Piles		year		#N/A	\$0.00	\$0
Pit Walls		year		#N/A	\$0.00	\$0
WR GTC Monitoring		year		#N/A	\$0.00	\$0
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs*		year		#N/A	\$0.00	\$0
Site water monitoring		each		#N/A	\$0.00	\$0
- Active closure and flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)	Aquatics - Non-contact water basins (10 years)	year	1	Sabina	\$4,800.00	\$4,800
Terrestrial Animal Monitoring	Terrestrial Animal Monitoring (10 years)	year	1	Sabina	\$24,000.00	\$24,000
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Maintain gravel road surface		year		#N/A	\$0.00	\$0
Maintain airstrip surface		year		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"		LS		#N/A	\$0.00	\$0
Subtotal, Annual post-closure costs						\$28,800
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				10	years	
Present Value of payment stream						\$245,670

**13 Years
(Year 11 to 23)**

ACTIVITY/MATERIAL - Monitoring & Maintenance	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
MONITORING & INSPECTIONS						
Total geotechnical inspections (1 yearly)		year		#N/A	\$0.00	\$0
Waste Rock Piles	Annual inspection of WR piles from closure to post-closure (13 years)	year	1	Sabina	\$8,300.00	\$8,300
Pit Walls	Annual inspection of pit walls from closure to post-closure (13 years)	year	1	Sabina	\$4,000.00	\$4,000
WR GTC Monitoring	Umwelt, Llana, and TSF WRSA ground temp cable annual monitoring. No GTCs at Echo WRSA (13 years)	year	1	Sabina	\$14,400.00	\$14,400
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs	annual reporting, management plans, progress reports (13 years)	year	1	Sabina	\$25,000.00	\$25,000
Site water monitoring	All pits and WR piles closure and post closure monitoring (13 years)	year	1	Sabina	\$9,120.00	\$9,120
- Active closure and flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)		year		#N/A	\$0.00	\$0
Terrestrial Animal Monitoring		year		#N/A	\$0.00	\$0
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Maintain gravel road surface	maintenance from closure to post-closure (13 years)	year	1	Sabina	\$13,650.00	\$13,650
Maintain airstrip surface	maintenance from closure to post-closure (13 years)	year	1	Sabina	\$3,900.00	\$3,900
Other				#N/A	\$0.00	\$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"		LS		#N/A	\$0.00	\$0
Subtotal, Annual post-closure costs						\$78,370
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				13	years	
Present Value of payment stream						\$833,461

**Beyond Post Closure
(Long Term 1 to 5, 7,
10, 15, 25)**

ACTIVITY/MATERIAL - Long Term Monitoring	Notes	Units	Quantity	Cost Code	Unit Cost	Total Cost
MONITORING & INSPECTIONS						
General Water Sampling and Stability Monitoring	long term general monitoring	year	1	Sabina	\$40,000.00	\$40,000
Waste Rock Piles		year		#N/A	\$0.00	\$0
Pit Walls		year		#N/A	\$0.00	\$0
WR GTC Monitoring		year		#N/A	\$0.00	\$0
Survey inspection		each		#N/A	\$0.00	\$0
Regulatory costs		each	1	RPTH	\$20,000.00	\$20,000
Site water monitoring		year		#N/A	\$0.00	\$0
- Active closure and flooding		each		#N/A	\$0.00	\$0
- Post pit flooding		each		#N/A	\$0.00	\$0
Wildlife Effects Monitoring Program (WEMP)		year		#N/A	\$0.00	\$0
Terrestrial Animal Monitoring		year		#N/A	\$0.00	\$0
Vegetation Monitoring		each		#N/A	\$0.00	\$0
Maintain gravel road surface		year		#N/A	\$0.00	\$0
Maintain airstrip surface		year		#N/A	\$0.00	\$0
Other - Site Access	Float plane access	each	1	MWH	\$9,100.00	\$9,100
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	\$0.00	\$0
Repair erosion - upgrade diversion ditches		allow		#N/A	\$0.00	\$0
Remove problem vegetation		allow		#N/A	\$0.00	\$0
Repair animal damage		allow		#N/A	\$0.00	\$0
Repair/upgrade access controls		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	\$0.00	\$0
Clear spillway		each		#N/A	\$0.00	\$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	\$0.00	\$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"		LS		#N/A	\$0.00	\$0
Subtotal, Annual post-closure costs						\$69,100
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity			See Long Term years			
Present Value of payment stream						\$407,696

Annual Discout Rate: 3%					
Project Phase	Project Year	Closure Year	Post-Closure Monitoring Year	Long Term Monitoring (GTCs, physical, water)	
				One Time Cost	Yearly Total NPV
Operations	1				\$0
	2				\$0
	3				\$0
	4				\$0
	5				\$0
	6				\$0
	7				\$0
	8				\$0
	9				\$0
	10				\$0
Active Closure	11	1			\$0
	12	2			\$0
Passive Closure	13	3			\$0
	14	4			\$0
	15	5			\$0
	16	6			\$0
	17	7			\$0
	18	8			\$0
Post Closure	19	9	1	\$69,100	\$54,548
	20	10	2	\$69,100	\$52,959
	21	11	3	\$69,100	\$51,417
	22	12	4	\$69,100	\$49,919
	23	13	5	\$69,100	\$48,465
Beyond Post Closure	24	14	6		\$0
	25	15	7	\$69,100	\$45,683
	26	16	8		\$0
	27	17	9		\$0
	28	18	10	\$69,100	\$41,807
	29	19	11		\$0
	30	20	12		\$0
	31	21	13		\$0
	32	22	14		\$0
	33	23	15	\$69,100	\$36,063
	34	24	16		\$0
	35	25	17		\$0
	36	26	18		\$0
	37	27	19		\$0
	38	28	20		\$0
	39	29	21		\$0
	40	30	22		\$0
	41	31	23		\$0
	42	32	24		\$0
	43	33	25	\$69,100	\$26,834
Net Present Value:				\$407,696	

1 Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Assumes mining equipment on abandoned mine site is operable and available.						
Light duty vehicles	Purchase pickups and Vans	each		#N/A	0	\$0
Telehandlers	Purchase (standby)	each		#N/A	0	\$0
Excavators	Purchase (320 Ex)	each		#N/A	0	\$0
Dump trucks	Purchase 30T	each		#N/A	0	\$0
Dozers	Purchase (D6T)	each		#N/A	0	\$0
Grader	Purchase (140M)	each		#N/A	0	\$0
Demolition shears	For a 320 Exc	each		#N/A	0	\$0
Crane	Purchase	each		#N/A	0	\$0
Loader	Purchase (966 Loader)	each		#N/A	0	\$0
Manlifts	Purchase (standby)	each		#N/A	0	\$0
Small Equipment		LS		#N/A	0	\$0
Compactor		each		#N/A	0	\$0
MOBILIZE MISC. EQUIPMENT						
Assumes mining equipment on abandoned mine site is operable and available.						
Pump shipping		each		#N/A	0	\$0
Pipe shipping		m		#N/A	0	\$0
Minor tools and equipment		allow		#N/A	0	\$0
Truck tires		allow		#N/A	0	\$0
Other				#N/A	0	\$0
MOBILIZE CAMP						
Build 20 Person Camp	Goose Closure Camp	LS	1	Sabina	\$19,250.00	\$19,250
Build 20 Person Power Plant	Goose Closure Camp	LS	1	Sabina	\$19,250.00	\$19,250
Reclamation activities		allow		#N/A	0	\$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	\$0
WORKER ACCOMODATIONS						
Camp operation		mandays	12,000	Sabina	\$110.00	\$1,320,000
Reclamation activities		manmonths		#N/A	0	\$0
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	0	\$0
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre		#N/A	0	\$0
Fuel freight - long term reclamation activities		litre		#N/A	0	\$0
Oil & Other		litre		#N/A	0	\$0
Fuel freight accomodations		litre		#N/A	0	\$0
GENERAL CONSTRUCTION INDIRECT						
Tooling, consumables, office & safety supplies	covered in Summary tab indirects	mandays		#N/A	0	\$0
DEMOBILIZE HEAVY EQUIPMENT						
Excavators		km		#N/A	0	\$0
Dump trucks		km		#N/A	0	\$0
Dozers		km		#N/A	0	\$0
Demolition shears		km		#N/A	0	\$0
Crane		km		#N/A	0	\$0
Loader		km		#N/A	0	\$0
Compactor		each		#N/A	0	\$0
Light duty vehicles		km		#N/A	0	\$0
Other		km		#N/A	0	\$0
DEMOBILIZE CAMP						
Food and Freight		kg	27,600	Sabina	\$12.00	\$331,200
Freight		Lot	1	Sabina	\$500,000.00	\$500,000
Mobilization		tonnes	500	Sabina	\$1,500.00	\$750,000
MOBILIZE & DEMOBILIZE WORKERS						
Crew travel time - inbound & outbound	16 manhours per rotation	manhours	6,864	lab-sh	\$49.60	\$340,454
Crew transportation - inbound & outbound	28 day rotations - 12,000 man days	each	429	Sabina	\$572.46	\$245,583
WINTER ROAD						
Construction and operation	Assumes construction and maintance of 2-160 km winter ice roads; once during Active Closure and once in approximately Year 18.	km	320	WRCL	\$2,000.00	\$640,000
Limited winter use		km		#N/A	0	\$0
Winter road tarriff		km		#N/A	0	\$0
					Total	\$4,165,738

Sabina Closure Component Estimating

Code	Description	NOTES	EQUIPMENT NUMBER	ESTIMATE SOURCE DOCUMENT	Qty	Unit of Measure	Labour					Const Equip Use		Other		Total	
							Unit Man-hrs	Prod Fact	Total Man-hrs	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost
Open Pit Closure																	
Place Boulder Fence																	
	Umwelt Open Pit			x	1,635	m	0.06	1.00	98	95	9,320	175.00	17,168		-	16	26,487
	Echo open pit			x	750	m	0.06	1.00	45	95	4,275	175.00	7,875		-	16	12,150
	Goose open pit			x	1,900	m	0.06	1.00	114	95	10,830	175.00	19,950		-	16	30,780
	Llama open pit	Perimeter needed only where pit edge will not abute the final flooded lake footprint. i.e. 400m length.		x	400	m	0.06	1.00	24	95	2,280	175.00	4,200		-	16	6,480
Remove Pump and Pipeline																	
	Umwelt pit sump	Occurs during Operations		x	1,740	m	0.02	1.00	35	95	3,306	175.00	6,090		-	5.40	9,396
	Llama pit sump	Occurs during Operations		x	2,850	m	0.02	1.00	57	95	5,415	175.00	9,975		-	5.40	15,390
	Goose pit sump			x	4,325	m	0.02	1.00	87	95	8,218	175.00	15,138		-	5.40	23,355
	Echo pit sump	Occurs during Operations		x	820	m	0.02	1.00	16	95	1,558	175.00	2,870		-	5.40	4,428
Breach Pits into Receiving Waters																	
	Umwelt open pit			x	1,200	m3	0.12	1.00	144		-	5.00	6,000		-	5.00	6,000
	Llama open pit	Natural drainage connection		x	-	m3	0.12	1.00	-		-	5.00	-		-	-	-
	Echo open pit	Natural drainage connection		x	-	m3	0.12	1.00	-		-	5.00	-		-	-	-
	Goose open pit			x	600	m3	0.12	1.00	72		-	5.00	3,000		-	5.00	3,000
Landfill Mobile Equipment																	
	Goose Site Mobile Equipment			x	41	units	24.00	1.00	984	95	93,480	-	-		-	2,280	93,480
Underground Closure																	
Saline Water Pond (SWP) / WTP																	
	Relocate pipeline to Umwelt UG from Llama UG			x	800	m	1.00	1.00	24	95	2,280	6.00	1,500		-	4.73	3,780
	Dewater SWP to Umwelt UG			x	763,134	m3	1.00	1.00	153	95	14,535		-	0.11	83,945	0.13	98,480
	Decommission SWP to Umwelt UG pipeline			x	1,200	m	0.02	1.00	24	95	2,280	3.00	3,600		-	4.90	5,880
	Adjust pipeline to route to Llama UG	Completed during Operations		x	500	m	0.03	1.00	65	95	6,175		-		-	12.35	6,175
	Dewater SWP to Llama UG			x	324,234	m3		1.00	80	95	7,600		-	0.11	35,666	0.13	43,266
	Adjust pipeline to route to Goose UG			x	4,500	m	0.03	1.00	185	95	17,575		-		-	3.91	17,575
	Dewater SWP to Goose UG			x	391,630	m3		1.00	215	95	20,425		-	0.11	43,079	0.16	63,504
	Decommission SWP to Goose UG pipelines			x	10,800	m	0.02	1.00	216	95	20,520		-		-	1.90	20,520
	Breach SWP Diversion Berms and Containment Dams			x	430	m3	0.12	1.00	52		-	8.00	3,440		-	8.00	3,440
	Decommission WTP-Goose Lake pipeline			x	1,140	m	0.02	1.00	65	95	6,175		-		-	5.42	6,175
Llama UG																	
	Decommission pipeline	Completed during Operations		x	2,700	m	0.02	1.00	54	95	5,130	3.00	8,100		-	4.90	13,230
Umwelt portal																	
	Plug declines with waste rock			x	150	m3	0.05	1.00	8		-	6.00	900		-	6.00	900
Llama portal																	
	Plug declines with waste rock			x	150	m3	0.05	1.00	8		-	6.00	900		-	6.00	900
Goose portal																	
	Plug declines with waste rock			x	150	m3	0.05	1.00	8		-	6.00	900		-	6.00	900
Echo portal																	
	Plug declines with waste rock			x	150	m3	0.05	1.00	8		-	6.00	900		-	6.00	900
Umwelt vent/circular backfill raises																	
	Plug vent raises with concrete plug			x	1	LS	1.00	1.00	60		-	-	-		-	120,000	120,000
Llama vent/circular backfill raises																	
	Plug vent raises with concrete plug			x	1	LS	1.00	1.00	60		-	-	-		-	50,000	50,000
Goose vent/circular backfill raises																	
	Plug vent raises with concrete plug			x	1	LS	1.00	1.00	60		-	-	-		-	50,000	50,000
Echo vent/circular backfill raises																	
	Plug vent raises with concrete plug			x	1	LS	1.00	1.00	60		-	-	-		-	50,000	50,000
Echo crown pillar																	
	Plug UG stopes			x	3,550	m3	0.05	1.00	178		-	6.00	21,300		-	6.00	21,300
Waste Rock Stockpiles and Landfills																	
WR Pile Closure																	
	Cap and Slope WR Piles			x	2,400,000	m3	0.06	1.00	144,000		-	6.00	14,400,000		-	6.00	14,400,000

Landfill Closure																		
Cap and Reslope Landfills			x	25,000	m3	0.06	1.00	1,500		-	6.00	150,000			-	6.00	150,000	
Water Management Structures																		
Llama Structures																		
Breach Llama Lake Diversion Berms			x	665	m3	0.06	1.00	43		-	7.30	4,855			-	7.30	4,855	
Breach Llama WRSA Diversion Berm			x	95	m3	0.06	1.00	6		-	7.30	694			-	7.30	694	
Breach Llama WRSA Containment Dam				95	m3	0.06	1.00	6		-	7.30	694			-	7.30	694	
Decommission Llama pump and pipeline	24 hrs for pump		x	700	m	0.02	1.00	38	95	3,610	1.20	840			-	6.36	4,450	
Umwelt Structures																		
Breach Primary Pond Containment Dam			x	200	m3	0.06	1.00	13		-	7.30	1,460			-	7.30	1,460	
Breach Umwelt WRSA Containment Dam			x	120	m3	0.06	1.00	8		-	7.30	876			-	7.30	876	
Breach Umwelt WRSA Diversion Berm			x	95	m3	0.06	1.00	6		-	7.30	694			-	7.30	694	
Remove Umwelt Pond pump and pipeline			x	950	m	0.02	1.00	49	95	4,655	1.20	1,140			-	6.10	5,795	
Remove Primary pond pump and pipeline			x	7,250	m	0.02	1.00	175	95	16,625	1.20	8,700			-	3.49	25,325	
Echo Structures																		
Breach Echo WRSA Containment Dam			x	190	m3	0.06	1.00	12		-	7.30	1,387			-	7.30	1,387	
Breach Echo Diversion Berm (East and West)			x	190	m3	0.06	1.00	12		-	7.30	1,387			-	7.30	1,387	
Breach Echo WRSA Diversion Berm			x	95	m3	0.06	1.00	6		-	7.30	694			-	7.30	694	
Breach East Echo Containment Dam			x	95	m3	0.06	1.00	6		-	7.30	694			-	7.30	694	
Remove Echo WRSA Pond pump and pipeline			x	2,400	m	0.02	1.00	48	95	4,560	1.20	2,880			-	3.10	7,440	
Remove Echo NCW pond pump and pipeline			x	220	m	0.02	1.00	16	95	1,558	1.20	264			-	8.28	1,822	
Goose Structures																		
Breach Goose Main Diversion Berm			x	95	m3	1.00	1.00	95		-	7.30	694			-	7.30	694	
TSF Structures																		
Breach TSF Dam			x	11,000	m3	0.05	1.00	550		-	7.30	80,300			-	7.30	80,300	
Breach TSF WRSA Diversion Berm			x	285	m3	0.05	1.00	14		-	7.30	2,081			-	7.30	2,081	
Ore Stockpile Structures																		
Remove pump and pipeline			x	4,550	m	0.02	1.00	91	95	8,645	1.20	5,460			-	3.10	14,105	
Breach Ore Stockpile Diversion Berm and Containment Dam			x	215	m3	0.06	1.00	13		-	7.30	1,570			-	7.30	1,570	
Buildings and Equipment																		
Dissassembly - Goose Plant and Crusher																		
Dismantle Plant			x	6,464	m2	1.00	1.00	3,200	95	304,000	100.00	106,667			-	-	63.53	410,667
Dismantle Crushers			x	1,630	m2	1.00	1.00	800	95	76,000	100.00	26,667			-	-	62.99	102,667
Dismantle Power Plant			x	2,040	m2	1.00	1.00	1,000	95	95,000	100.00	33,333			-	-	62.91	128,333
Dismantle Emergency Power - Fuel			x	300	m2	1.00	1.00	150	95	14,250	100.00	5,000			-	-	64.17	19,250
Dismantle Fuel Storage and Distribution			x	1	Lot	1.00	1.00	1,200	95	114,000	100.00	40,000			-	-	154,000	154,000
Goose Admin Buildings																		
Demolish Truck Shop/Office			x	2,349	m2	1.00	1.00	1,000	95	95,000	100.00	33,333			-	-	54.62	128,333
Demolish Kitchen/Camp			x	1,980	m2	1.00	1.00	900	95	85,500	100.00	30,000			-	-	58.33	115,500
Demolish Cold Storage			x	840	m2	1.00	1.00	150	95	14,250	100.00	5,000			-	-	22.92	19,250
Demolish Waste/Waste Oil Storage			x	1	Lot	1.00	1.00	100		-	100.00	3,333	40,000	40,000	-	-	43,333	43,333
Remove Freight Storage			x	1	Lot	1.00	1.00	150	95	14,250	100.00	5,000			-	-	19,250	19,250
Demolish Water Treatment Plant			x	647	m2	8.00	1.00	100	95	9,500	100.00	3,333			-	-	19.84	12,833
Demolish Sewage Treatment Plant			x	1	Lot	1.00	1.00	90	95	8,550	100.00	3,000			-	-	11,550	11,550
MLA Infrastructure																		
Demolish Port Office			x	5	Units	12.00	1.00	60	95	5,700	100.00	6,000			-	-	2,340	11,700
Remove Pipelines			x	10,000	m	0.02	1.00	200	95	19,000	100.00	20,000			-	-	3.90	39,000
Demolish Incinerator and Waste Management			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Demolish Warehouses			x	1	Lot	1.00	1.00	30	95	2,850	100.00	3,000			-	-	5,850	5,850
Dismantle Genset			x	1	Lot	1.00	1.00	150	95	14,250	100.00	15,000			-	-	29,250	29,250
Demolish Maintenance Shop			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Demolish Water Storage			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Demolish WTP/STP			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Demolish camp/offices			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Demolish freight storage area			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Demolish hazardous waste Area			x	1	Lot	1.00	1.00	50	95	4,750	100.00	5,000			-	-	9,750	9,750
Dismantle Fuel Storage			x	1	Lot	1.00	1.00	1,600	95	152,000	100.00	53,333			-	-	205,333	205,333
Goose Closure Camp																		
Build 20 Person Camp			x	1	Lot	1.00	1.00	150	95	14,250	100.00	5,000			-	-	19,250	19,250
Build 20 Person Power Plant			x	1	Lot	1.00	1.00	150	95	14,250	100.00	5,000			-	-	19,250	19,250
Camp Operation	Over 13 years of Closure and Post-Closure		x	12,000	Man Days	1.00	1.00			-	-	-			110	1,320,000	110	1,320,000
Roads and Airstrips																		
Main Haulroad																		
Maintain Road Surface			x	13	Yr	70.00	1.00	910	95	86,450	100.00	91,000			-	-	13,650	177,450
Restore Drainage	Remove Culverts		x	1,488	m3	0.06	1.00	89		-	11.00	16,368			-	-	11.00	16,368

Airstrips																
Maintain Airstrip Surface			x	13	Yr	20.00	1.00	260	95	24,700	100.00	26,000		-	3,900	50,700
Restore Drainage			x	1,020	m3	0.06	1.00	61		-	12.00	12,240		-	12,000	12,240
Water Treatment																
WTP Pipelines and Treatment Plant																
Pump from Goose Main TF to WTP	Pump and treat water in TF at WTP for 7 years, open water season		x	7,500,000	m3		1.00			-	-	-	0	825,000	0.11	825,000
Treat water from Goose Main TF in TWP			x	7,500,000	m3		1.00	1,916		-	-	-	0	2,625,000	0.35	2,625,000
Pump from WTP recirc. into Goose Main TF			x	7,500,000	m3		1.00			-	-	-	0	825,000	0.11	825,000
Decommission WTP pump and pipeline			x	6,700	m	0.02	1.00	158	95	15,010	100.00	15,800		-	4.60	30,810
Decommission WTP pump and return pipeline			x	820	m	0.02	1.00	40	95	3,838	100.00	4,040		-	9.61	7,878
Decommission WTP			x	1	Lot		1.00	50	95	4,750	100.00	5,000		-	9,750	9,750
Contaminated Soil																
Sitewide Investigation																
Site Investigation to estimate quantity of contaminated soil	Testpit program with excavator in all parking, fuel storage, washbays truck and maintenance shops and generator areas.		x	1	Lot	1.00	1.00			-	-	-		50,000	50,000	50,000
Treatment																
Transport contaminated soil			x	10,000	m3	0.05	1.00	500		-	7.30	73,000		-	7.30	73,000
Separation plant	Purchase separation equipment		x	1	Lot	1.00	1.00			-	-	-		100,000	100,000	100,000
Closure / Post-Closure Monitoring																
Geotechnical Inspections																
TSF embankments			x	8	Units	20.00	1.00	160		-	-	-	10,000	80,000	10,000	80,000
WR piles			x	13	Units	20.00	1.00	260		-	-	-	8,300	107,900	8,300	107,900
Pit walls			x	13	Units	20.00	1.00	260		-	-	-	4,000	52,000	4,000	52,000
Ground Temperature Monitoring																
Umwelt WRSA GTC Monitoring after Closure	Monthly		x	13	Years	24.00	1.00	312	200	62,400	-	-		-	4,800	62,400
LLama WRSA GTC Monitoring after Closure	Monthly		x	13	Years	24.00	1.00	312	200	62,400	-	-		-	4,800	62,400
TSF WRSA GTC Monitoring after Closure	Monthly		x	13	Years	24.00	1.00	312	200	62,400	-	-		-	4,800	62,400
WQ Monitoring - Closure																
Llama pit	Depends on Breach		x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Llama WR Pile			x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Umwelt pit	Depends on Breach		x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Umwelt WR Pile			x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Echo pit	Depends on Breach		x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Echo WR pile			x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Goose pit	Depends on Breach		x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
TSF WR Pile			x	13	Years	12.00	1.00	156	95	14,820	-	-		-	1,140	14,820
Aquatic Effects monitoring																
Aquatic effects monitoring	Non-contact Water Basins		x	10	Years	60.00	1.00	600	80	48,000	-	-		-	4,800	48,000
Terrestrial Animal Monitoring																
Terrestrial Animal Monitoring			x	10	Years	300.00	1.00	3,000	80	240,000	-	-		-	24,000	240,000
Total Direct Costs																
CONSTRUCTION INDIRECTS																
Freight & Transport																
Food & Freight	Total Mandays factored		x	27,600	kg		1.00			-	-	-	12	331,200	12	331,200
Freight	Rental equip, offices, etc..		x	1	Lot	-	1.00			-	-	-	500,000	500,000	500,000	500,000
Mobilization			x	500	Tonnes								1,500	750,000	1,500	750,000
General Construction Indirects																
Site Services Labour			x	16,000	HRS	1.00	1.00	16,000	65	1,040,000	-	-		-	65.00	1,040,000
Accommodations & Travel																
Camp Accommodations/Operation			x	12,000	Man Days	1.00	1.00			-	-	-	110	1,320,000	110	1,320,000
Airfare & Transportation			x	429	Each	-	1.00			-	-	-	572	245,583	572	245,583
Contractor Profit																
Total Component Estimate																28,221,373

Appendix H. Vegetation Monitoring Plan



**BACK RIVER PROJECT:
Vegetation Monitoring Program**

February 2017

BACK RIVER PROJECT VEGETATION MONITORING PLAN

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1. Introduction

The proposed Back River Project (the Project) lies in western Nunavut in the continuous permafrost zone of the continental Canadian Arctic. It is composed of two main areas: the Marine Laydown Area (MLA) (Figure 1) and the Goose Property Area (Figure 2), with a winter ice road (WIR) connecting the two (Figure 3).

The MLA is located on the western shore of Southern Bathurst Inlet, approximately 130 kilometres (km) north of the Goose Property (Figure 2). Here, the Project will sealift materials and supplies through Bathurst Inlet to the MLA annually during the open-water season only.

The Goose Property includes four open pits and four underground developments and the Project has an estimated mine life of 10 years with a total production of 19.8 million tonnes (Mt) of ore. Key Project infrastructure at the Goose Property includes:

- four open pits, and four underground mines (Umwelt, Llama, Goose Main, and Echo);
- four waste rock storage areas;
- tailings storage facility;
- underground mining pads;
- a stockpile;
- camp;
- process plant; and
- airstrip and roads, including a culvert for the haul road crossing.

A WIR will be utilized between the MLA and Goose property to allow the movement of supplies during the winter months.

This Plan represents an adaptive approach to understanding the effects of the Project on the landscape and the species that live there. In this context, 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.

1.1 PURPOSE

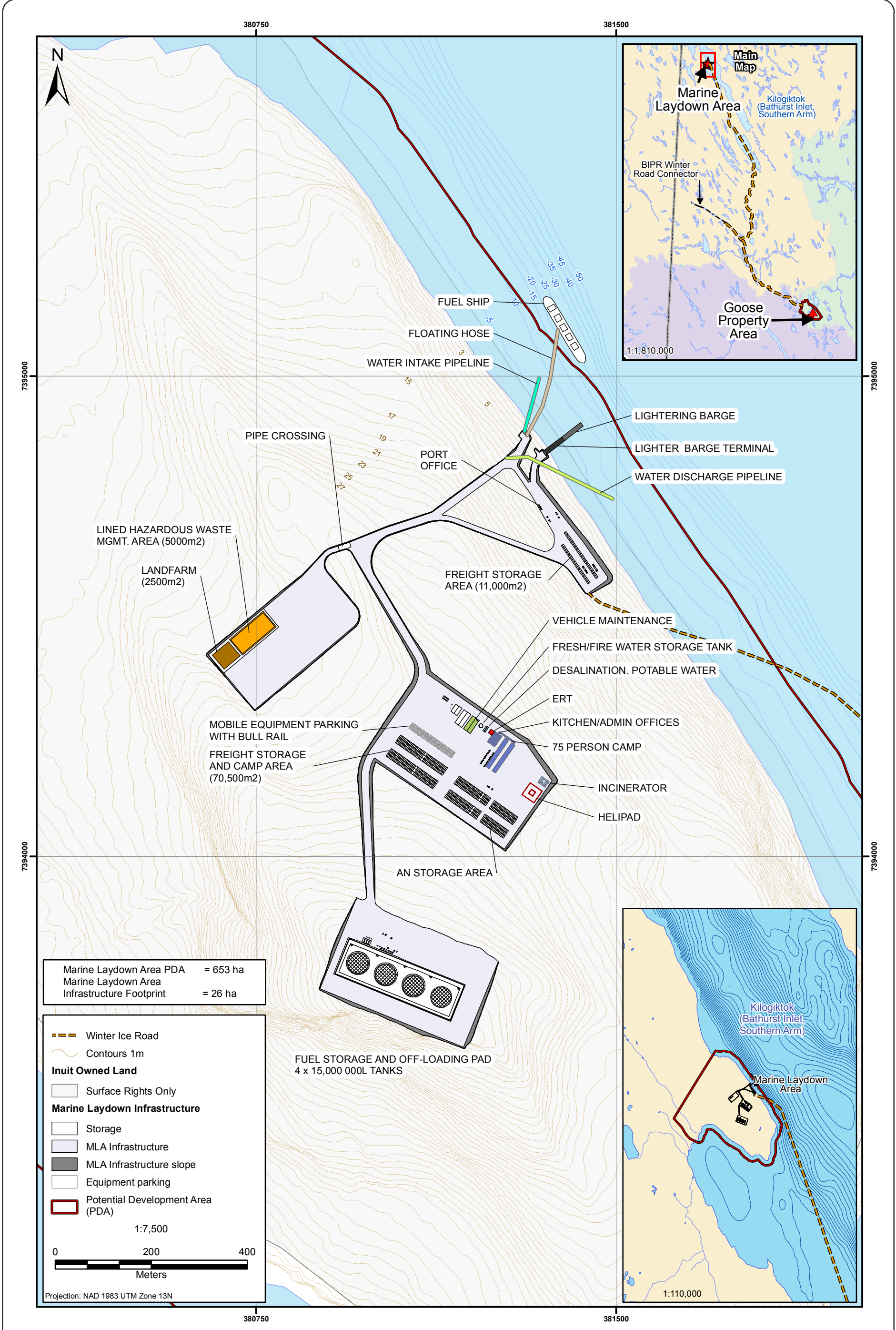
During the FEIS Final Hearings, Sabina and GN jointly submitted the following commitment (GN-C-25):

In consultation with the KIA, GN, and other relevant parties the Proponent shall develop and implement a vegetation monitoring plan for the winter road that is designed to quantify the potential impacts on vegetation. The plan shall be submitted to the NIRB prior to winter road

construction. Findings from these studies will be used to inform reclamation planning as appropriate.

Subsequently, the Nunavut Impact Review Board (NIRB) Final Hearing Report encouraged Sabina to consider additional mitigation and monitoring for the protection of vegetation and additional measures to limit potential impacts due to the introduction of invasive species from construction and clearing operations.

Since the FEIS Final Hearing, and in recognition of the NIRB's concerns, Sabina has developed this Vegetation Monitoring Plan (the Plan) which is in line with commitment GN-C-25.



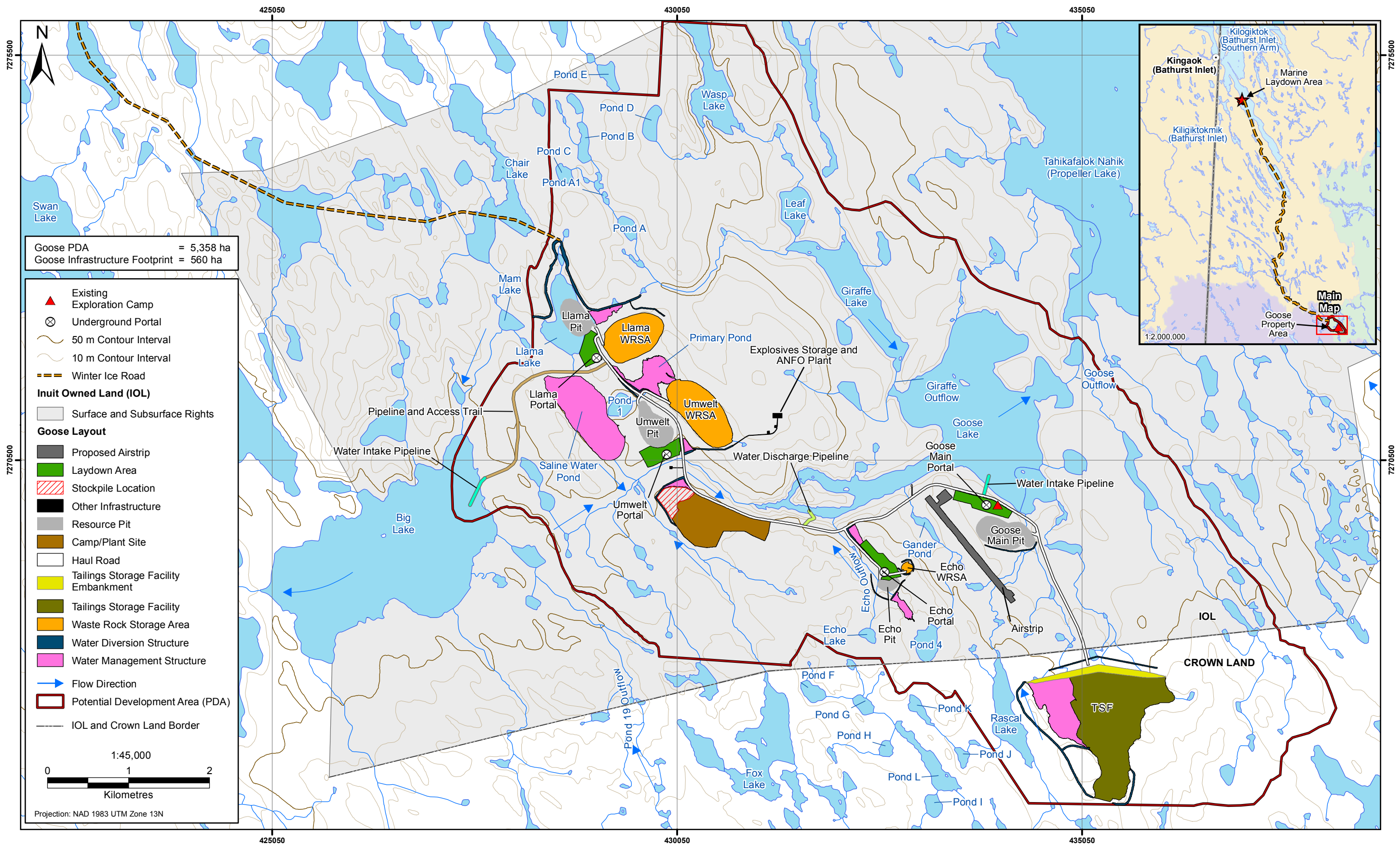


Figure 2