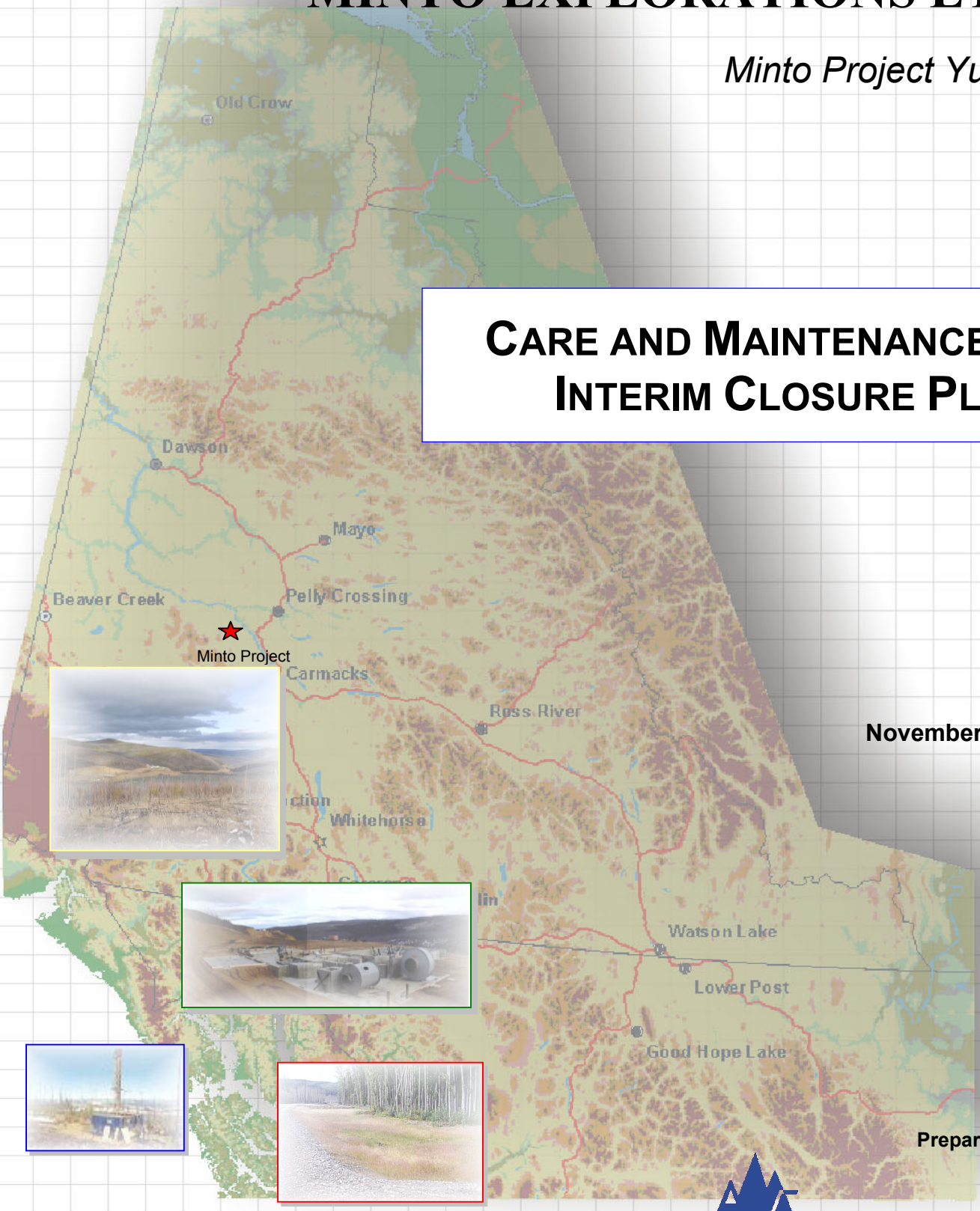
MINTO EXPLORATIONS LTD.

Minto Project Yukon



CARE AND MAINTENANCE & INTERIM CLOSURE PLAN

November 2003

Prepared by:

ACCESS MINING CONSULTANTS LTD.

accessconsulting.ca

Minto Explorations Ltd.

Minto Project, Yukon

CARE AND MAINTENANCE
&
INTERIM CLOSURE PLAN

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Distribution

Yukon Water Board	**5 Bound, 1 Unbound, 1 CDROM**
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TABLE OF CONTENTS

List of Figures

List of Tables

List of Plates

List Of Appendices

1.0 INTRODUCTION

The Minto Copper Project is operated under the corporate name of Minto Explorations Ltd. Minto Explorations Ltd. is a publicly owned company, 57.5% of which ASARCO Inc. owns (hereafter referred to as the Company). ASARCO Inc. is a wholly owned subsidiary of Grupo Mexico S.A. de C.V.

The Company has a Type A Water Use Licence (QZ96-006) issued pursuant to the Yukon Waters Act (YWA) and Regulations for the mine and milling operations. This Water Use Licence was issued in 1998, and was screened under the Canadian Environmental Assessment Act (CEAA) in April, 1997. Water Use Licence QZ96-006 was amended (Amendment #1) to revise the interim decommissioning requirements for the project. The Company continues to ensure that all water licence obligations are fulfilled.

This document is submitted towards fulfillment of the requirements of Part G – Decommissioning and Reclamation of Water Licence QZ96-006.

This Care and Maintenance & Interim Closure Plan (the "Plan") addresses two areas:

1. continued care and maintenance of the present project infrastructure, and
2. closure issues related to the decommissioning of site developments at the Minto mine and reclamation of the site.

Since no mining has yet been conducted at the property, the plan presents closure scenarios based on current conditions.

The current status of the mine is also presented in this report.

A comprehensive Plan is presented for all activities that need to be undertaken for an environmentally safe and responsible closure of the Minto mine, as it presently exists. The mine and related infrastructure to support mining and milling activities has not yet been fully constructed. Once the Company has made a production decision, the remaining components of the project will be constructed, including the mill, tailings facilities, open pit and waste rock storage areas. Development of those mine components and their operations will expand

existing areas of disturbance and a new decommissioning and reclamation plan will be developed and submitted to the Yukon Water Board (YWB). As a production decision has not been made, the Company's primary objective is to continue to maintain the existing infrastructure to support future mine development. However, as required by the Water Use Licence, an interim decommissioning and reclamation plan is presented for current conditions in the unlikely event that a production decision is never made.

The Plan addresses the long-term physical stability of the site, including reclamation of surface disturbances. A program is presented for site management and monitoring both during implementation of closure and after decommissioning and reclamation measures are completed. The Plan is based on the best information available at the present time. As additional planning, information, and/or experience at the site becomes available, the details of the plan will be updated and/or altered as necessary. Decommissioning and reclamation costs estimates are provided and licensed financial security requirements reviewed.

1.1 CLOSURE PHILOSOPHY

In keeping with its high standards for environmental and social responsibility, the Company intends to implement an environmentally sound and technically feasible interim decommissioning and reclamation plan for the Minto mine should it be required. Closure planning and the implementation of this phase at a mine site must be undertaken with appropriate environmental care, while respecting local laws, public interest and ensuring that the Company's high environmental standards are achieved. Necessary environmental protection measures have been adopted in the development of this interim Plan to ensure that a healthy environment exists after mine closure. This approach is consistent with the Company's Corporate Environmental Safety and Health Policy, which states:.

> *"Minto Explorations Ltd. recognizes and believes that its operations should be designed and managed to protect the natural surroundings, provide a safe and healthy work environment, and permit the responsible and cost-effective extraction of natural resources. Minto Explorations Ltd. intends to comply with all applicable legislation and regulations and to match industry best practices in its operations."*

A principle tenet of the philosophy followed during the development of this Plan was to work towards an eventual passive closure. This involved an assessment of the key mine components that could potentially place the public or the environment at risk following closure. Mitigation measures have been incorporated into the elements of the Plan to address public safety issues and environmental concerns with post closure monitoring and inspections planned to ensure that this objective is met. Once the effectiveness of the mitigation measures are assured, then management of the site can be safely reduced to a level that is consistent with closure. It is anticipated that final determination of the effectiveness of closure measures for passive status will be the subject of review and concurrence with regulatory agencies, First Nations and the public.

The Company has entered into a comprehensive agreement with the Selkirk First Nation. All activities at the site, including closure measures are guided by this important relationship. Therefore, detailed consultation with the Selkirk First Nation forms a foundation for this document.

Where possible, performance-based criteria have been adopted for this Plan. The Water Use Licence decommissioning and reclamation plan performance criteria for physical structures has been reviewed and criteria selected to conform to the closure philosophy.

To ensure that the closure philosophy can be achieved, the following objectives were emphasized during the development of this plan:

- Protection of public health and safety;
- Implementation of environmental protection measures that prevent adverse environmental impact;
- Ensuring land use commensurate with surrounding lands;
- Ensuring full consultation with the Selkirk First Nation, so that closure measures are appropriate and supported by the local peoples who are most affected;
- Recognize mine start-up and construction in the short term and incorporate long term closure measures;
- Progressive reclamation measures implemented during mine opening;
- Post closure monitoring of the site to assess effectiveness of closure measures for the long term; and

- Passive post closure monitoring and management of the site until the former mine presents evidence of an environmentally benign site.

1.2 SCOPE OF PLAN

The scope of the Minto mine Interim Decommissioning and Reclamation Plan was the subject of a project review meeting between the Company's agent (Access Consulting Group) and representatives from the Government of Yukon, Water Resources Branch, which was held in Whitehorse on July 16, 2003.

The elements of the meeting can be summarized as follows:

- The Water Use Licence (Part G) calls for submission of an Interim Decommissioning and Reclamation Plan;
- It was explained, by the Company's agent, that the requirement for an Interim Decommissioning and Reclamation Plan presented a difficult challenge for the Company, as there are no plans to decommission the existing site infrastructure;
- The Company's present approach is to continue to provide care and maintenance of the existing infrastructure (roads, bridge, culverts, camp, mill foundations) until a production decision is made;
- Upon a decision to proceed with production, further site develop would occur. At this time a new Decommissioning and Reclamation Plan would be developed and submitted for closure of the producing mine and infrastructure; and
- The Company does recognize, however, that closure measures and a plan are needed for the existing conditions should a decision to not go into production be made.

The parties agreed that the Plan would include the following components*:*

- *Plans for decommissioning and reclamation of the access road;*
- *Plans for decommissioning and reclamation of the mill site;*
- *Plans for continued care and maintenance of the existing site infrastructure;*
- *Plans for decommissioning and reclamation of the mine camp;*
- *Plans for decommissioning and reclamation of the exploration trails, exploration trenches and the airstrip;*
- *Plans for post closure monitoring and maintenance; and*

- *Closure measures costing and security provisions for the current site conditions.*

To achieve these goals, a review of pertinent historical information relating to the Minto operation was undertaken. Table 1-1 Global Information List, presents a listing of reports and other information sources that are related to and/or have been prepared specifically for the Minto Project. Many of theses documents were reviewed in preparation of this Plan.

Various closure options were assessed to ensure that closure objectives were met for each mine component.

The approach taken towards development of this Plan is to present a brief description of each mine component and the closure issues and measures related to that component. Previous work or reports on the project have been referenced without repeating details so that this document is focused on continued site care and maintenance and interim decommissioning and reclamation.

Table 1-1 Global Information List

(List of Reports Related to and/or Prepared for the Minto Project)

Report Title / Topic	Author	Date
Initial Environmental Study of the Minto Project. Prepared for Wright Engineers Ltd.	Division of Applied Biology, B.C. Research	1976
Report to Wright Engineers Ltd. on 1976 Geotechnical Investigations, Minto Project Feasibility Study.	Golder and Associates	1976
An Assessment of the Pre-Development Water Quality and Biological Conditions in the Water Shed Around the Minto Ore Body.	Fisheries and Environment Canada, Environmental Protection Service	1977
The Minto Copper Deposit, Yukon Territory: A Metamorphosed Ore Body In The Yukon Crystalline Terrane", An M.Sc. Thesis, Queen's University, Kingston, Ontario, Canada	Pearson, W.N.,	1977
The Minto Project, Yukon, Mineral Inventory Review Minto Explorations Ltd, Vancouver, B.C.,	H.L. Klingmann and J.S. Proc	1994
Minto Project, Initial Environmental Evaluation, Supporting Volume I, Development Plan. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1994
Minto Project, Initial Environmental Evaluation, Supporting Volume II, Environmental Setting. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1994
Minto Project, Initial Environmental Evaluation, Supporting Volume III, Socioeconomic Description and Impact Assessment. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1994
Survey of Firekilled Fuelwood Harvest Potential, Minto Creek, Yukon, Prepared for Minto Explorations Ltd. Vancouver, B.C.	John Gibson	1994
“Development of the Minto Project Process Design”, Project No. 8553-15	Kilborn Engineering Pacific Ltd.	1994
An Impact Assessment of the Minto Project. Memo from the Selkirk First Nations to the Northern Affairs Program.	Magrum	1994
Minto Project Prospectus prepared for Minto Explorations Ltd.	Pearson, Hofman and Assoc. Ltd.	1994
Minto Area Archaeology And History - Final Report of the Minto Archaeological Impact Assessment Project	Sheila Greer, Edmonton	1994
Technical Feasibility Study - Thickened Tailings Disposal System - Minto Project - Phase 1. Laboratory Tailings Characterization Tests, Project 94-608	E.I Robinsky Associates Limited, Consulting Engineers	1995
Geotechnical Design Tailings/Water Dam, Minto Project, Yukon	EBA Engineering Consultants Ltd., Edmonton, Alberta, 0201-95-11509	1995

Report Title / Topic	Author	Date
Metallurgical Test Work And Mill Design Criteria", Minto Project, Yukon	H.L. Klingmann	1995
The Minto Project, Yukon, Feasibility Study – May 1995	H.L. Klingmann & J.S. Proc, Vancouver, BC	1995
Minto Project, Initial Environmental Evaluation, Supporting Volume IV, Environmental Mitigation and Impact Assessment. Prepared for Minto Explorations Ltd.	Hallam Knight Piesold Ltd.	1995
Minto Project, Application for Land Use Permit YA5F045. Submitted as reference to the YWB.	Minto Explorations Ltd.	1995
Minto Explorations Ltd., Minto Project, Proposed Designs for Big Creek Crossing, Minto Creek Crossing, Yukon River Barge Landings	N.A. Jacobsen, P. Eng., Civil Engineering Consultant, Whitehorse, Yukon.	1995
Minto Explorations Ltd., Access Road Design Report	Yukon Engineering Services, Whitehorse, Yukon	1995
Environmental Assessment Screening Report and Project Summary: Land Use Permit Application YA5F045 and Water Licence Application MS95-013.	Department of Indian Affairs & Northern Development (DIAND) and YWB	1996
Environmental Assessment Screening Report: Minto Explorations Ltd. Minto Property. Whitehorse, Yukon Territory.	DIAND and Regional Environment Review Committee	1997
Revised Preliminary Dam Design, Minto Project, YT	EBA Engineering Consultants Ltd., Edmonton, Alberta.	1997
Construction Quality Assurance Manual for Waste Dumps, Tailings/Water Dam, Mill Water Pond and Diversion Ditch, Minto Project, Yukon", Project No. 0201-95-11509	EBA Engineering Consultants Ltd., Whitehorse, Yukon	1997
Design Brief Tailings/Water Dam, Minto Project, Yukon Project No. 0201-95-11509	EBA Engineering Consultants Ltd., Whitehorse, Yukon	1997
Brief to the YWB, re. Water Licence Application QZ96-006 Minto Explorations Ltd..	Environment Canada and Fisheries and Oceans Canada	1997
Minto Project, Application for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	1997
Review of Hydrology for Minto Project	Remi J.P. Allard Rescan Environmental Services Ltd.	1997
Geotechnical Evaluation - Proposed Main Waste Dump - Minto Project - Yukon Territory - 0201-95-11509	EBA Engineering Consultants Ltd., Edmonton, Alberta	1998
Minto Project, Geology, Ore Reserves & Mine Design	H.L. Klingmann and J.S. Proc	1998

Report Title / Topic	Author	Date
Mill Water Pond, Minto Project	H.L. Klingmann and J.S. Proc	1998
Grout Curtain For The Tailings/Water Dam	H.L. Klingmann and J.S. Proc	1998
Minto Explorations Ltd., Minto Project, 6102-01, Design Progress At June 1998. Vancouver, B.C.	Rescan Engineering Ltd.	1998
Cumulative Effects Assessment, Minto Project. Prepared for Minto Explorations Ltd.	Access Consulting Group	1999
Construction Monitoring Report Grout Curtain for Tailings/Water Dam, Minto Project, Yukon. Prepared for Minto Explorations Ltd.	EBA Engineering Consultants Ltd.	1999
Revised Construction Specification Tailings/Water Dam Minto Project, Yukon. Prepared for Minto Explorations Ltd.	EBA Engineering Consultants Ltd.	1999
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	1999
Minto Project, Yukon – Site Inspection & Compilation of Environmental Information. Prepared for DIAND, Renewable Resources Waste Management Program.	Access Consulting Group	2000
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2000
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2001
Minto Project, Decommissioning and Reclamation Plan.	Minto Explorations Ltd.	2001
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2002
Minto Project, Annual Report for Water Licence QZ96-006. Submitted to the YWB.	Minto Explorations Ltd.	2003

1.3 STATUTORY AND REGULATORY RESPONSIBILITIES

1.3.1. *Regulatory Agencies*

Several agencies are involved in authorizing and monitoring mining projects in the Yukon. Pursuant to the YWA and *Yukon Waters Regulations*, the YWB has granted a Water Use Licence to authorize quartz mining at the Minto mine. The YWB has permitted this undertaking after its review of an environmental assessment and screening completed for the project. The

environmental assessment pursuant to the CEAA was completed for this project in 1997. In addition, the Company has a Quartz Mining Production Licence issued under the Quartz Mining Act (YQMA).

The Company has taken a proactive approach towards their regulatory responsibilities by meeting with various government regulatory agencies, boards, and local First Nations. Periodic meetings are held to provide project updates. A similar approach is planned for implementation of the Plan.

Prior to implementing the closure measures described in this Plan, both the YWB and Government of Yukon, Water, Land & Mineral Divisions, will be informed of the Company's intentions to implement the Plan. Meetings will also be held with Environment Canada, Environmental Protection, Department of Fisheries and Oceans, Environmental Health, and Government of Yukon departments of Environment and Occupational Health and Safety to apprise regulators of planned site activities. A similar meeting will be held with the Selkirk First Nation and the local community. These meetings should ensure that regulatory agencies' concerns with closure implementation are met.

The Company will also cooperate with the Mining Land Use Division of the Government of Yukon to address non-water related issues.

1.3.2. *Approvals and Licences*

The project proponent currently holds one Water Licence: Type A - QZ96-006 for quartz mining, which expires on June 30, 2006. This licence (QZ01-053) was amended on August 6, 2002, to address interim decommissioning and reclamation requirements. The Company also previously held a Type B Water Use Licence (MS95-013) for miscellaneous works along the main property access road. The Company is required to comply with the terms and conditions of the current Type A licence and of the YWA. The Government of Yukon, Water Resources Division, monitors compliance with licence terms and conditions.

A Production Licence has been secured for the mine pursuant to Section 139 of the YQMA (QLM-9902). Both the Type A Water Use Licence and Production Licence will govern future mining operations at the site. It is anticipated that both of these licences will be renewed to

authorize continued start-up operations at the mine. As noted previously, once operations commence at the mine, the Company is required to develop and submit a detailed decommissioning and reclamation plan for the project. This plan for the project would be implemented once mining and milling operations are completed and mineral resources are exhausted.

Upon final decommissioning and reclamation, the Company would apply for a closure certificate under the YQMA legislation at the conclusion of the implementation of the final closure measures to seek government approval of conditions at the site.
Various other agencies grant the permits necessary to develop, operate and close a project of this nature. As part of implementing the Plan, the Company would ensure that the various other licences and/or permits that are required for undertaking various closure measures are secured and followed.

1.4 DOCUMENT ORGANIZATION

Section 1 of this document introduces the philosophy and scope for the interim care and maintenance and decommissioning and reclamation plan for the site and the Company's corporate background. Information is provided on the property and its history and a discussion of regulatory responsibilities regarding interim closure.

Section 2 provides a project description, including a brief overview of the current status of the Minto mine and the Company's plans for eventual mine opening.

Section 3 provides a brief summary of the environmental setting for the mine.

Section 4 outlines the Company's interim care and maintenance program and activities to be followed prior to a formal production decision being made and start-up operations initiated.

Section 5 provides a detailed description of the interim closure plan for current conditions for the various components including mine mill foundations, mine camp, other infrastructure, and the site access road and other trails. This section presents a description of each of the project components and outlines potential closures issues. The plan for decommissioning and reclamation activities for each of these areas is then presented.

Section 6 presents the implementation schedule for the plan.

Section 7 deals with post closure site management plans and activities. This section presents the environmental management measures proposed for the interim decommissioning and post closure period.

Section 8 provides an updated cost estimate for implementing the interim closure plan.

Section 9 provides report references.

1.5 ACKNOWLEDGEMENTS

This report benefited from input by the following companies:

Minto Explorations Ltd. – Dale Dixon provided overall direction for the Project as well as the corporate policy framework and senior technical review of the proposed closure measures. Jim Proc's (Consultant) knowledge of the Project and of the general area also proved valuable.

Access Mining Consultants Ltd. – Responsible overall project management, document preparation and coordination.

Selkirk First Nation – Provided input into the development of closure scenarios based on current and potential future use of the project area.

Others – Site access to the property was made possible by Heinz Sauer, a local businessman (water taxi and freight operator).

2.0 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND AND LOCATION

The Minto Project is a copper-gold-silver project located on the west side of the Yukon River approximately 75 km (47 miles) north-northwest of Carmacks, Yukon Territory. The mine site and access road lie within the traditional territory of the Selkirk First Nation and comprises part of land claim settlement parcels R-6A, R-44A (Type A settlement lands) and R-40B. The Company concluded a comprehensive cooperation agreement with the Selkirk First Nation on September 16, 1997. This agreement is still in effect.

Copper deposits were first discovered in 1970 and claims were staked in 1971. Extensive exploration yielded the first significant drill intersection in July of 1973. The Minto and DEF claims and leases cover an area of approximately 10 square miles. Mineable reserves for the deposit, above a cut-off grade of 0.50% copper, consist of 8,818,000 tonnes at grades of 1.73% copper, 0.48 g/t gold and 7.5 g/t silver. Current project design parameters are based upon 6,510,000 t at grades of 2.13% copper, 0.62 g/t gold and 9.3 g/t silver.

The ore deposits are to be mined using conventional open pit truck and loader operations and processed in a mill with a designed throughput of 477,000 t of ore per year. Thickened tailings will be deposited upstream of the storage dam and supernatant liquor and precipitation will collect in the main water storage pond.

A total complement of 79 employees will be required once the mine is in full production. A camp to accommodate 54 people was constructed in 1998.

The property is accessible by crossing the Yukon River at Minto Landing. Barge landings have been constructed for ice-free crossing and an ice bridge is used upon freeze-up of the Yukon River. The initial 16 km of access road along the western side of the Yukon River and the bridge across Big Creek were constructed in 1996. The remaining 12.8 km was constructed in the latter portion of 1997.

Preliminary site development was initiated at the property in 1996. Construction activities at the suite can be summarized as follows.

1996 Construction

The initial 16 km of access road and a barge landing on the west side of the Yukon River and the bridge across Big Creek were constructed.

1997 Construction

The remaining 12.8 km of access road were constructed with only final grading and minor clean-up to be done after the 1998 spring break-up.

The site for the permanent camp was excavated. A water well to supply domestic water for the camp was drilled to a depth of 72 m, tested and equipped. A set of septic tanks was installed and a leach field was constructed. A camp services unit built in Whitehorse during the winter months was moved to site. This unit includes a water purification system, water storage for both fire protection and for domestic purposes and has provision for housing a generator for emergency power generation.

The mill site was excavated and various roads on site and the pit perimeter road for the first phase of mining were constructed.

Two used grinding mills were purchased in the United States, dismantled and shipped to the Yukon and across the Yukon River.

1998 Construction

The mill footings were constructed. A total of 1,688 m^3 of concrete was placed over a period of eight weeks.

The Company purchased a used, eight-unit, 42-man bunkhouse and a new, seven-unit kitchen/diner/change house complex. These units were erected on site and all services such as sewage disposal, potable water supply and power distribution were installed.

Final grading, minor cleanup and reclamation were done along the 28.8 km long access road. The road was in excellent condition and approximately sixty loads of freight were hauled to site during the three months of construction.

A grout curtain, designed to control seepage through the foundation of the tailings/water dam, was completed.

1999 Construction

A short construction program was completed in September 1999. The two grinding mills were moved to site, mill components were cleaned, sandblasted and painted and the two mills were assembled. Svedala Canada Inc. completed a detailed inspection of the mills and submitted a proposal for the final installation of the mills.

2000 Construction

The Company completed work on the camp in September 2000 and additional engineering work is ongoing. Engineering is now 95% complete.

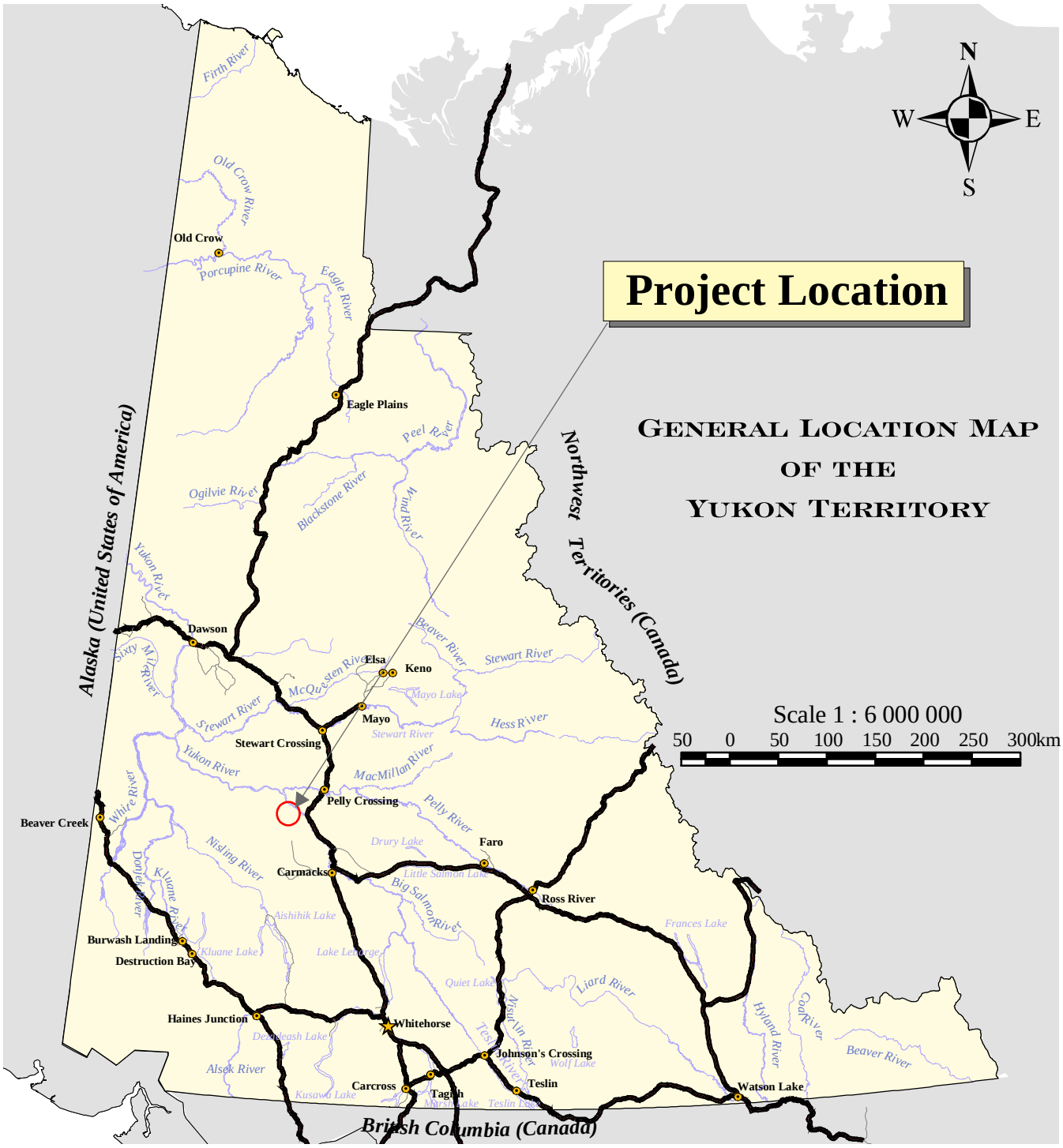
2001 Construction

Road maintenance and repair work was done along the access road in the vicinity of Big Creek as per a recommendation by BK Hydrology Service, which was submitted to the YWB on January 8, 2001.

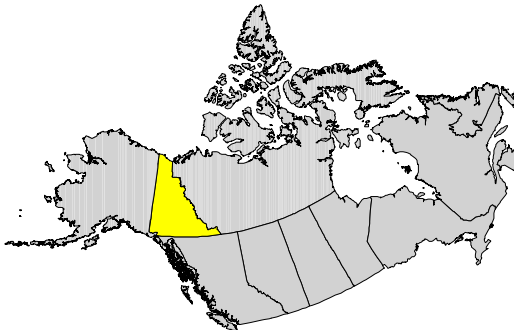
Once a production decision is made, start-up construction activities at the mine will be initiated.

Table 1-2 provides a summary of the Project location and environmental setting information for the study area. This table provides physical Project location information, geographic reference, access route, watershed drainage, special designations, and key environmental features within the study area. The information has been extracted from a number of documents, including previous *CEAA* screenings, and is summarized in Table 1.

Figure 1 and Figure 2 present visual depictions of the general project location with in the Yukon.



Minto Explorations Ltd.



Minto Project, Yukon

Care and Maintenance and Interim Closure Plan

Drawn By: NS	**Figure 1.**
Checked By: TR	Date: Aug 27, 2003

File: D:\Project\MIN-03-01\ArcMap\MXD\Figure1.mxd

Minto Project, Yukon
Care and Maintenance &
Interim Closure Plan

Minto Explorations Ltd.

Legend

- Watercourse
- Contour Interval, 100'
- Access Road
- First Nation Settlement Lands
- Existing Trail System
- Mining Claims
- Licensed Surface Water Quality Monitoring Station

Project Area Overview

2.5km 5km

Scale approx 1:100 000

ACCESS MINING CONSULTANTS LTD.

DRAWN BY: LDR/NS | CHECKED BY: TR

DATE: 28/08/2003

Figure 2

Wolverine Creek
R-41B
Yukon River
W2
Lower Minto Creek
Minto Creek
DEF Claims
W3
Upper Minto Creek
Minto Claims
Airstrip
Minto Mine Site
R-06A
Big Creek Bridge
Dark Creek
R-10B
North Klondike Highway #2
R-11B
R-03A
Big Creek
R-44A
Minto Landing
To Carmacks
R-44B
Existing Barge Crossing
Minto Access Road
R-43B

Table 2-1 Project Area Overview

Project Area Attribute	Description
Region:	Yukon
Topographic Map Sheet:	NTS 115 I/10, 115 I/11
Geographic Location Name Code:	Minto Project
Latitude:	62° 36' N
Longitude:	137° 15' W
Drainage Region:	Yukon River
Watersheds:	Yukon River, Big Creek, Wolverine Creek, Dark Creek, and Minto Creek.
Nearest Community:	Pelly Crossing, Yukon, approx. 33 km north on Klondike Highway.
Access:	Klondike Highway, Barge crossing on Yukon River at Minto Landing, Minto mine access road.
Traditional Territory:	Northern Tutchone, Selkirk and Little Salmon/Carmacks First Nation peoples. Traditional use for hunting, trapping and fishing.
Surrounding Land Status:	Selkirk First Nation Settlement Lands and Federal Crown Land.
Special Designations:	Lhutsaw Wetland Habitat Protection Area located approx. 17 km NE of Minto Landing (outside the project area).
Ecoregion:	Yukon Plateau (Central) - Pelly River Ecoregion.
Study Area Elevation:	Rolling hills above mine site at 1131 metres to 600 metres at the Yukon River Valley bottom.
Site Climate:	Temp. ranges from –30.9°C (Jan. 1994) to 12.1°C (July.1994). Mean annual temp. of -7.3°C. Mean annual precipitation is 378mm.
Vegetation Communities:	Riparian, black spruce, white spruce, paper birch, lodgepole pine, buck brush/willow and ericaceous shrubs, feathermoss, sedge, sagewort grassland, mixed, aspen, balsam, and sub-alpine. Discontinuous permafrost is present on site. Site has been subject to recent forest fires.
Wildlife Species:	Moose, caribou, Dall sheep, mule deer, grizzly and black bear, varying hare, beaver, lynx, marten, ermine, deer mouse, fox, mink, wolverine, least weasel, wolf, squirrel, porcupine coyote, muskrat, otter and wood frog. Bird species include: spruce, blue, ruffed, and sharptail grouse, waterfowl, raptors, and a variety of smaller birds.
Fish Species:	In the Yukon River, chinook, coho, and chum salmon, rainbow trout, lake trout, least cisco, bering cisco, round whitefish, lake whitefish, inconnu, arctic grayling, northern pike, burbot, longnose sucker and slimy sculpin; In Big Creek, Chinook and chum salmon, arctic grayling and whitefish species; In Wolverine Creek, chinook salmon, arctic grayling, and slimy sculpins; In Minto Creek and project area watershed (primarily lower reaches), slimy sculpi8n, round whitefish, arctic grayling.
Known Heritage Resources:	East side of Yukon River in the vicinity of Minto Landing four historic sites designated KdVc-2 (Minto landing), KdVc-3 (Minto Resort), KdVc-4 (Old Tom's Cabin), and KdVD-1 (Minto Creek).

Note: Information summary drawn from various sources, including several Minto project reports and the CEAA screening report.

2.2 CURRENT STATUS

The Minto mine has not yet been brought into production and is currently idle, awaiting the return of more favorable metals prices. Once a production decision has been made, project construction and start-up activities would commence. The project has seen only minor site development. In 1998, the construction of the mill footings, employee camp, and grout curtains for the tailings/water dam were completed. The entire site is clean, inventoried, and kept in a 'standby' mode ready for a decision to go into production. The site is under the care of the Company and a part-time caretaker. The caretaker provides security for the site, conducts periodic checks of the mill and the general area, mine camp, as well as documenting site maintenance requirements. Annual maintenance is conducted on the access road and camp to facilitate planned start-up. Details of the current state of all facilities are provided in later sections of this report.

Water quality monitoring, as required by Water Licence QZ96-006, is conducted on an annual basis. This ensures that adequate baseline data is compiled prior to formal operational start-up.

Figure 3 presents an overview of current site conditions.

Yukon River

Trapper's Cabin
- Glenn Bullied (owner)
- Miscellaneous debris, scrap metal

Explosives Magazine
- Semi trailer

Minto Creek Crossing
- Twin 1500mm culverts
- Riprap armour

Borrow #3
- Active
- Some Revegetation
- Stockpiled overburden around perimeter
- Stockpiled aggregate material
- Area 60m x 40m

Mine Refuse Area
- Small amount of debris (wood, plastic, scrap metals)
- Partially or completely buried
- Area 30m x 60m

Minto Creek

Project Road Construction Camp
- Reclaimed

Trappers Cabin
- Glenn Bullied (owner)
- Destroyed by Fire 1995

Borrow #2
- Recontoured
- Moderate Revegetation
- Gravel/Sand/Organics
- Area 50m x 50m

Tailings Impoundment Dam Area
- Grout curtain completed 1998
- Tailings dam not constructed

Borrow #1
- Recontoured
- Some Revegetation
- Gravel Substrate
- Area 100m x 30 m

Minto Landing

North Klondike Highway #2

Big Creek

Old Drilling Area/Core Storage
- Miscellaneous exploration related debris
- Abandoned weather station
- Core storage crates

Minto Access Road

To Carmacks

Airstrip
- Partially overgrown

Mill and Ancillary Facilities
- Mill Foundation completed 1998
- Campsite - Staff facilities, septic field, genshack, and liquid petroleum storage, completed 1998/99
- Ball Mill and SAG Mill added 1999
- 3.61 Ha

Flood Protection Berms
- Big Creek riprap armoured
- 4 road flood protection berms

Big Creek Bridge Landings
- Barge Landings Stable

Big Creek Bridge Crossing
- Steel, clear span with concrete decking
- 40m length x 5m width
- 10" x 10" guard rails (wood)
- Concrete abutments (riprap armoured)
- 4 piles supporting concrete structure
- Flood protection berms (0-300m northwest along road)

Dark Creek

N

Minto Project, Yukon
Care and Maintenance &
Interim Closure Plan

Minto Explorations Ltd.

Legend

- Watercourse
- Contour Interval, 100'
- Access Road
- Mining Claims

Project Area Current Conditions

1.5km 3km

Scale approx 1:82 000

DRAWN BY: LDR/NS | CHECKED BY: TR

DATE: 28/08/2003

Figure 3

2.3 REOPENING PLANS & PROJECTIONS

The Company plans to initiate mining and milling operations when satisfactory metal prices return. The Company is confident that this will occur as world copper markets return to a more balanced supply and demand situation.

The Company proposes the following criteria to define the status of the mine as being in a state of pre start-up and interim closure:

- The site will continue to be inspected several times annually and maintenance works conducted as required;
- The main access road would continue to be maintained in a manner that heavy equipment could be brought on site on short notice to deal with any environmental emergency;
- Buildings and facilities on the site are being adequately monitored and maintained; and
- Major fixed equipment and buildings remain intact onsite.

It cannot be predicted when metal prices will begin to rise enough to make the Minto mine economically viable. Proven and probable reserves are estimated at 8,818,000 tonnes at 1.73% Cu; 0.48% g/t Au, and 7.5 g/t Ag. The mine life is projected to be 11 years. The Company will continue to consult with government agencies and First Nations to ensure that development plans are presented to these agencies.

3.0 ENVIRONMENTAL SETTING

A detailed description of the environmental setting of the project area has been excerpted from a report prepared previously for this project on behalf of DIAND. The relevant section of that document is included here as Appendix A. Table 2-1 provides a summary of the key environmental features near the project area.

4.0 CARE & MAINTENANCE PROGRAM

As the project has not yet completed construction or start-up, the Company's priority is to maintain the existing site infrastructure to enable timely start-up. This includes regular and routine maintenance of the access road barge landings, access road, Big Creek bridge crossing, access road culverts, mill foundations and site camp. The following provides a summary of project components and inspection and maintenance checklist.

Table 4-1 Surveillance Program During Care and Maintenance

Project Component	Area of Interest	Timing/Frequency	Actions
Barge Landing	Access to Yukon River	Twice Annually	As required, granular upgrade to landing site.
Access Road and Surface Drainage	Entire Route	Twice Annually	As required, surface grading and granular amendments, ditch and culvert maintenance.
Precautionary Signage	Entire Site	Twice Annually	As required, repair and replace.
Mill and Camp Site	Buildings, Equipment, and Infrastructure	Twice Annually	As required, repair and replace.
Water Use Licence	Annual Report	Annually	Prepare and Submit to the Yukon Water Board pursuant to Water Use Licence QZ96-006

5.0 INTERIM CLOSURE PLAN – FOR CURRENT CONDITIONS

5.1 OVERVIEW

This section presents a discussion of the planned decommissioning and reclamation measures for the various facilities located on the Minto property.

The approach to each subsection is to present a description of each area so that readers are familiar with the existing facility and do not have to refer back to previous reports or information. Planned closure measures are then presented. Each section is supported with detailed figures and tables as required. Where needed, references are made to previous reports or supporting documentation. Figure 3, above, provides a general arrangement plan for current conditions at the site. Figure 4, 5, 6, and 7 presented in the following sections, provide a summary of the various closure measures for features on the general arrangement plan.

The primary objectives of land reclamation and revegetation at the Minto mine site are to provide short and long term erosion control, to ensure land use compatible with the surrounding lands, and to leave the area as a self-supporting ecosystem.

The overall goal is to prepare the site so that the vegetation returns to a state as near as possible to that in existence prior to mining activities. The Company has undertaken previous site revegetation and reclamation along portions of the access road and at borrow areas. Revegetation and fertilize mixtures are known and areas monitored for revegetation success. This information will be used to assist with planned reclamation measures for interim closure.

This section describes the current areas slated for reclamation, and the closure issues and measures proposed. Previous reclamation activities that have occurred on the property were observed during a June and July 1999 site visit. The extent of natural revegetation on previously disturbed areas was also observed. These observations were used to develop an overall reclamation and revegetation strategy for the site. Reclamation options for various types of disturbed lands were developed and are discussed below.

Natural Revegetation

Areas that are revegetating naturally on the site include disturbed lands adjacent to the tailings dam centreline, old borrow sources, exploration trails, airstrip and the cleared right-of-way of the main access road. Although an extensive survey was not conducted to document the extent of natural revegetation, the following observations were noted.

The primary colonizing plant species now found around the mine site are willows and graminoids. The extent of recolonization at each location is dependent on local conditions, including soil conditions (type and moisture content) and aspect. Generally, revegetation is occurring more extensively next to undisturbed areas. Much of the exploration trails and airstrip are completely recolonized.

Revegetation Options

The establishment of an initial ground cover of graminoids has historically been viewed as a desirable objective on most disturbed areas to stabilize slopes and control soil erosion. Reclamation and revegetation efforts on site will ensure that this objective is achieved; however, the establishment of existing or natural vegetative communities and species is also another desirable objective. Based on recent reclamation research, it is noted that there is typically an abundance of natural seed or reproductive seed material available from local surroundings, and that these naturally occurring seed sources should be considered as part of the reclamation program (Craig, et al., 1998).

The natural vegetation found on undisturbed sites around the mine generally indicate the underlying soil properties, including texture, drainage, and pH, and the level of available nutrients. Revegetation seed mixtures will ultimately be formulated for the Minto mine site using knowledge of the naturally occurring vegetation and soil conditions. Additional soil sampling on disturbed sites may be required in order to determine areas of localized nutrient deficiencies.

Evidence indicates that revegetation by the seeding of sod-forming grass species will inhibit the invasion of the area's natural colonizing species by competing for space, light, nutrients, sunlight and moisture (Craig, et al., 1998). Seeding predominantly with native species should aid in ensuring that the later successional stages of vegetative cover appear. Seed mixtures have been recommended for initial use. See Table 5-1 for the two seed mixes chosen for linear and non-linear disturbances.

The nutrient uptake by northern native seed varieties on nutrient deficient soil is usually more effective than nutrient uptake by southern agronomic species. Seeding with agronomic species at the Minto mine site may be required because of the high cost and limited availability of northern native revegetation species.

Closure objectives for the non-linear disturbances include slope and drainage stabilization, erosion prevention, and revegetation.

5.2 MAIN ACCESS ROAD

5.2.1. *General*

The main access road to the property was constructed in 1996 and 1997. Figure 2, above, illustrates the overall routing for this road. This road was constructed to facilitate traffic from 26-ton ore concentrate trucks. The road was constructed by cut and fill methods with a road width of 8 m and associated ditch drainage and culvert installations.

The Company expects that the determination of the main access road will be made in consultation primarily with the Selkirk First Nation and secondarily with local trappers, the community, and government regulators. The closure plan presents three options for road reclamation.

1. No road deactivation;
2. Road deactivation from Minto Creek to the mine site; or
3. Deactivation of the entire road.

In making a final decision about closing the main access road, consideration will also be given to the potential requirement for equipment access. Despite the identified closure timing and schedule, final access road removal (if selected) would only be undertaken once it is concluded that the site is stable.

Closure measures related to road decommissioning include final timeframe for road closure, stabilization of slopes and prevention of erosion, and stabilization of stream crossings.

Decommissioning of this road will include recontouring, scarification, and removal of stream culverts. On steeper slopes, erosion barriers will be placed at frequent intervals to ensure stability.

A number of culverts will be removed upon final closure of the road. Of key importance is the removal of culverts at stream crossings, which are fish bearing. At these stream crossings, the roadbed would be cut down to the culvert and original streambed elevation with side slopes brought back to 2:1. Material removed during culvert removal will be spread loosely on adjacent road surface to promote revegetation. The stream channel would be stabilized and slopes revegetated.

The Big Creek Bridge and all culverts will be removed once all heavy equipment has been removed from the mine and closing reclamation has essentially been completed in the upper Minto Creek basin. Drainage patterns will be restored and road edges will be scarified and seeded as required.

The preferred methodology is to encourage natural revegetation to occur, after first preparing the road surface by recontouring, scarifying, and fertilizing. For the purposes of budgeting, the decommissioning and reclamation plan assumes that the access road will be seeded.

The road surface (approximately 65 hectares) will be revegetated with graminoids and legumes. The seed mixes used for revegetating this road will include native selections recommended for linear development in Region 5 as per Kennedy (1993). For costing purposes a seed selection was compiled and is presented in Table 5-1.

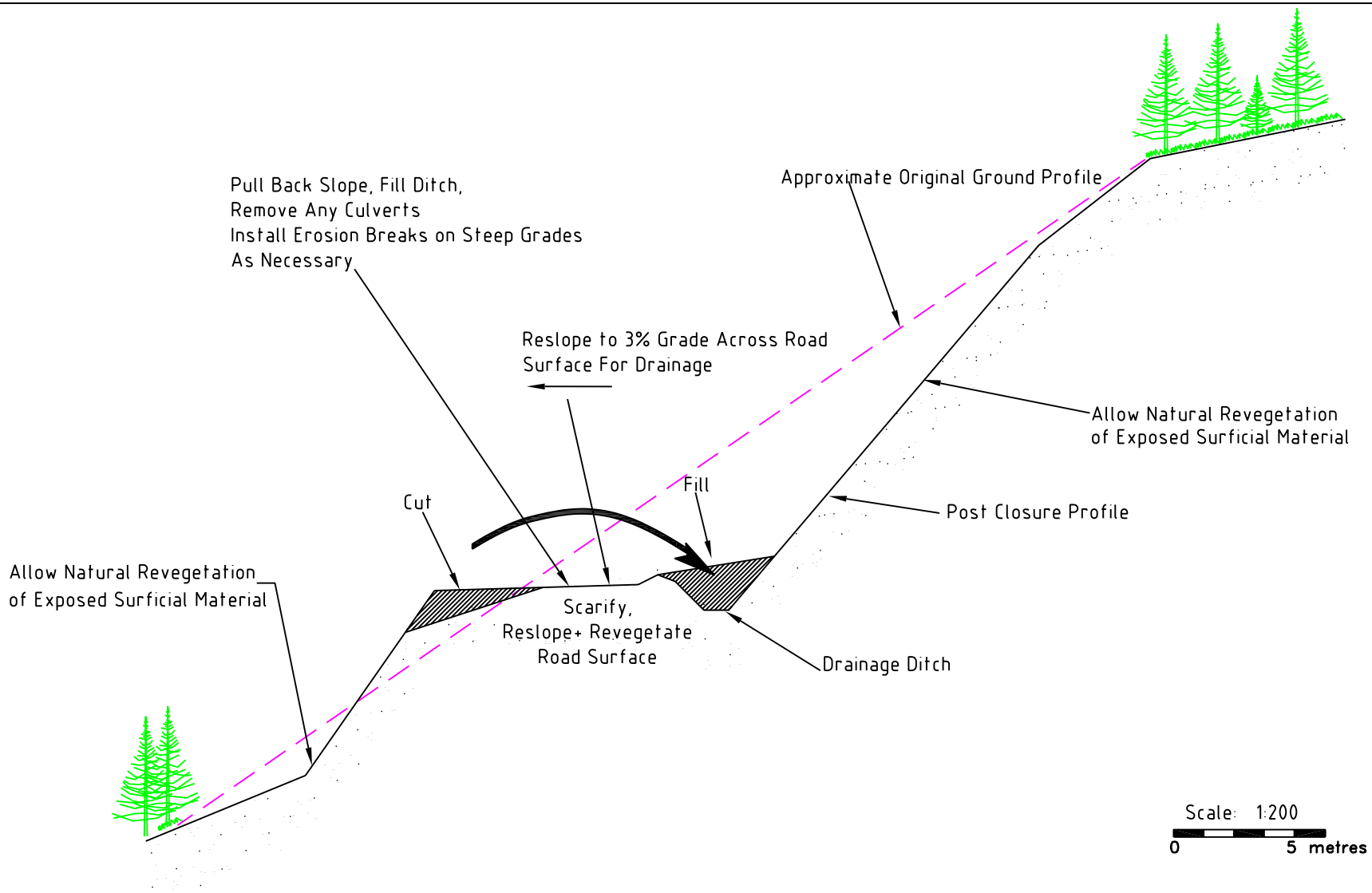
Closure objectives for the site access roads include slope and drainage stabilization, erosion prevention and revegetation.

Figure 4 depicts the typical treatment of the access road for closure, if selected.

Table 5-1 Selected Seed Mixtures for Revegetation

Native Species	Mix #3 Mixed Deciduous/Coniferous (Non-Linear Development) kg/ha	Mix #4 Linear Development kg/ha
Yukon wheatgrass	2	3
Violet wheatgrass	6	8
Northern fescue	2	3
Arctic lupine	2	2
Yellow locoweed		1
Glaucous bluegrass	2	3
Meadow foxtail		
Tufted hairgrass		
Polargrass		
Bluejoint reedgrass		
Altai fescue		
Fowl bluegrass		
Sheep fescue	2	3
Showy locoweed		1
Sweetgrass	1	
Total	17	24

Native species may be substituted with agronomic species, however, native species are recommended and require approximately one half the weight in seed as the agronomic species. (Adapted from Kennedy 1993)



Minto Explorations Ltd.	ACCESS MINING CONSULTANTS LTD.	Sand & Gravel Existing Vegetation	Minto Project, Yukon Care and Maintenance & Interim Closure Plan
			Typical Road Closure Cross-Section
		NOTE: DRAWING NOT FOR CONSTRUCTION - FOR ILLUSTRATIVE PURPOSES ONLY	DRAWN BY: ASH/NS; CHECKED BY: TR; DATE: 03/09/03
			Figure 4

5.3 AIRSTRIP & EXPLORATION ROADS AND TRAILS

An old exploration trail system exists around the height of land surrounding the general mine area. These trails primarily follow the local ridges navigating the highest elevations of the Minto Creek catchment basin. These trails have provided access for mineral exploration activities and are characterized by intermittent trenching lines, drilling pads, core sample storage crates, and various forms of non-hazardous debris related to these exploration activities. The trail system is also used by a local trapper (Glenn Bullied) who has a small cabin along the ridge immediately to the north of the mill and campsite. The airstrip and exploration trails comprise approximately 21 hectares of boreal forest, which was burned in a forest fire 1995.

The exploration trails are outside of the immediate mine site and have not actively been used for a number of years. The trails are smaller than the main access road and generally follow topographic contours (i.e. were not constructed using cut and fill techniques). They will be left to allow for natural vegetation to occur, which should be successful due to the proximity of the seed source and the minimal compaction during original construction and subsequent use. Some limited recontouring and stabilization may be required in a few locations where potential erosion is a concern. The closure measures for the trails have been developed in consideration of the local trapper's use of the area.

The airstrip is already revegetating naturally as it has also not been used for some years. As with the exploration trails, the airstrip will be left to naturally revegetate. The airstrip makes up approximately 0.6 ha of the total 21 ha.

5.4 MINE CAMP AND RELATED INFRASTRUCTURE

In 1999 the Company completed construction of a camp for mine staff that includes living quarters for 42 persons, a seven-unit kitchen/diner/changehouse complex. This complex is comprised of a number of trailer units, skirted and locked. The facility provides a potable water supply (drilled groundwater well, 1998), gas fired heat, a local power supply, and sewage disposal to an adjacent septic field. Several structures behind the facility, house the fuel supply to the furnaces, relay power from a diesel electrical generator, and pump fresh water.

Closure measures for the campsite include disassembly of the camp trailers and related infrastructure. All salvageable material will then be removed from the site. The remaining

campsite landing will be recontoured for erosion stabilization, scarified, and revegetated. Figure 7 presents and typical cross-section view of the proposed closure methods for the Mill and Camp areas.

Upon closure the septic tanks would be pumped out, crushed, and covered with local soils. The remaining infrastructure (i.e., piping and related materials, including the septic field) would also remain buried.

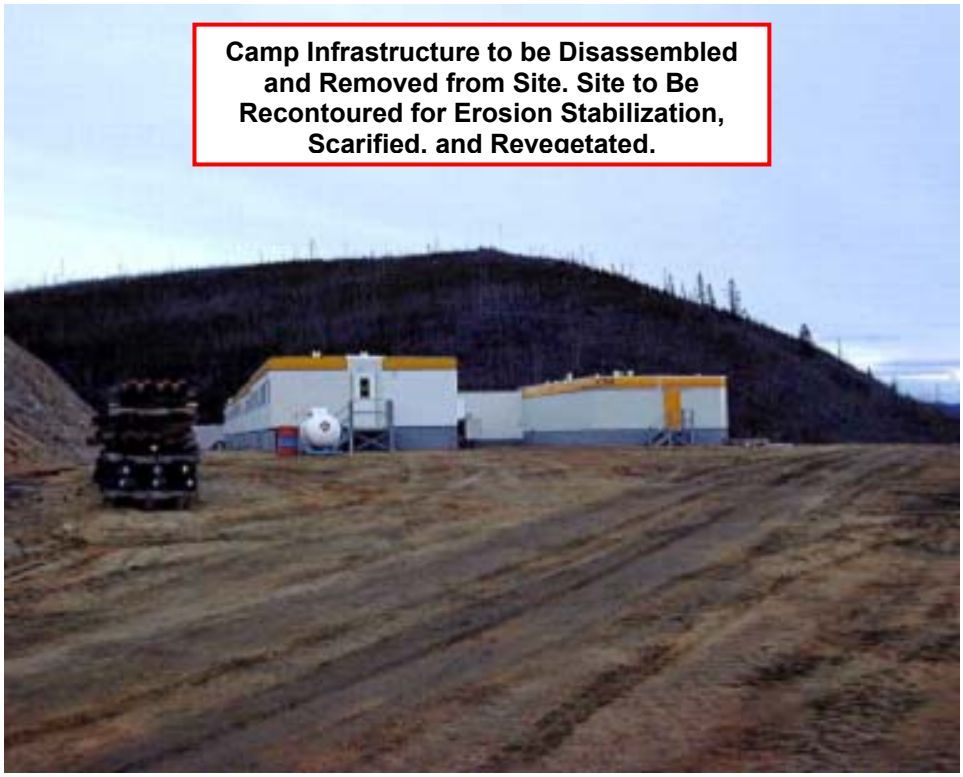


Plate 1 Minto mine Camp (Looking East)

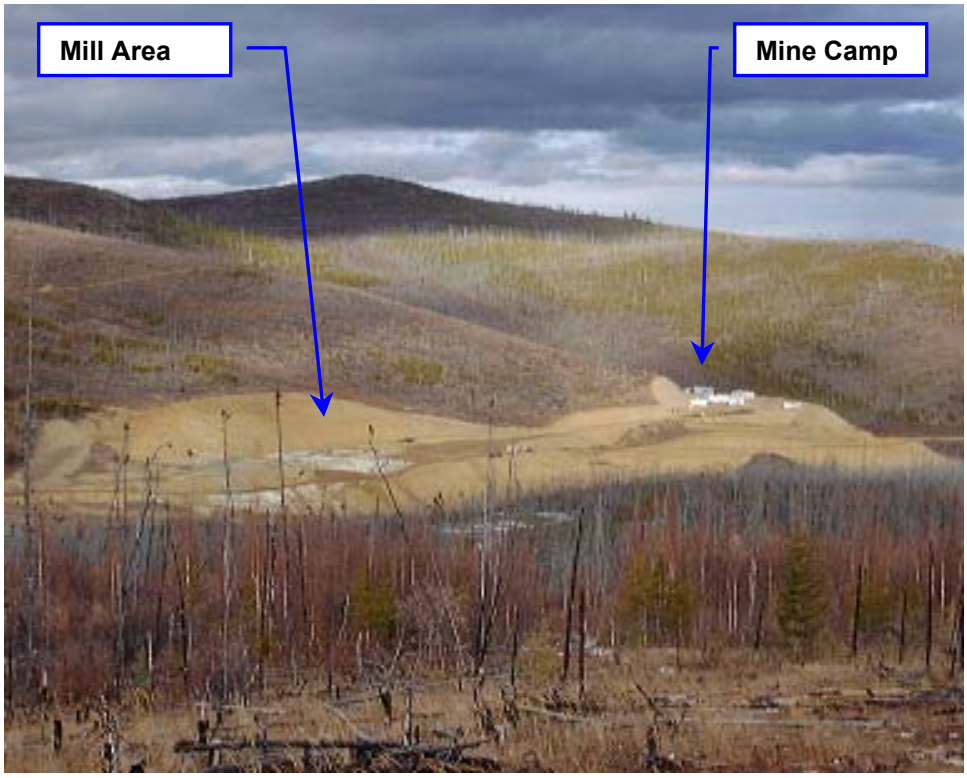


Plate 2 Mine Site Mill and Camp (Looking North)

5.5 MILL SITE

The mill footings and foundation were constructed in 1998 by Ketza Construction Corp. and have since seen limited placement of mill equipment. Portions of the concentrator equipment and ball/sag mill have been placed on the foundation/footings but are not yet fully assembled.

Plate 3 Mill Site (Looking south east towards camp and access road entry to mine site)

Closure measures for this site include removal of the salvageable mill components, such as the ball and SAG mill and milling related equipment stored here. The concrete mill foundations will then be demolished, covered with soil, and revegetated. The downhill slopes at both the mill and the campsite will then be recontoured to assume a more rounded slope, limiting erosion as much as possible.

5.6 MISCELLANEOUS

5.6.1. *Petroleum Hydrocarbons*

It is expected that the inventory of hydrocarbon products at the Minto site will be consumed as part of the interim closure. Fuels and lubricants will be required during the two-year period for implementation of the interim closure measures after mine shutdown. The inventory remaining on site once all activity has ceased will be removed from the site by one of three methods:

- returned to the original supplier for credit wherever possible;
- sold to a third party user; or
- trucked to an authorized disposal agency to be recycled or destroyed.

It should be noted that the operation of diesel powered vehicles and any electrical generators used on site will provide the Company with a method of reducing remaining inventory of diesel fuel as the mining operations cease. Gasoline will be similarly removed, and it is predicted that any remaining inventories of diesel and gasoline will be successfully returned to suppliers or sold based on its wide spread local use.

The propane supplier will remove propane tanks. Associated fuel delivery lines at the camp will be removed and disposed of in a manner similar to that of the gasoline and diesel fuels.

Other hydrocarbon products that may be present at the mine site are primarily hydraulic fluids, lubricating oils, greases, antifreeze and solvents packaged in either 1000 litre bulk cubes, 200 litre drums or smaller packaging. It is predicted that in most cases the remaining inventory of these materials will be successfully returned to the original suppliers for reuse or sold to other third party users in the local area. In certain circumstances, specialized products may have to be disposed of through a licensed waste disposal firm. It is anticipated that such material will be small in volume.

During the final site assessment, petrochemical contaminated soils will be identified and processed for remediation. Any fuel storage areas and refueling stations, once decommissioned, will then be assessed for soil contamination. The affected soils may be removed from the mine site and disposed of through a licensed hazardous waste disposal firm. The second, and more probable, method of disposal will be to have the soils removed to an area suitable for deposition of such material and where bioremediation may work to renovate the soils. In either event, the disposal will only take place following consultation with and approval from appropriate regulatory authorities.

5.6.2. *Scrap Metal*

Scrap equipment may been stored in various lay down areas (known as "bone yards") located on site and along the access road. This would include primarily scrapped equipment that was stored so that it could be utilized on the mine site as a source of spare parts or good recyclable scrap material. At mine closure, salvageable material from these sites will be sold as scrap and removed from the site. Material that has no scrap value will be disposed of in the existing site landfill area, located north of the mill site (see Figure 5). Prior to disposal in the landfill, all of this material will be examined to ensure that all hazardous materials have been removed. Hazardous materials so removed will be shipped off site to a licensed waste disposal site. A general inventory of scrap materials will be maintained and the fate of such materials at closure will be documented.

5.6.3. *Site Landfill*

The site landfill, located in an area north of the Mill Site, will be an area used for the disposal of non-putrescible wastes that have no salvage value, such as lumber and scrap steel. Although the exact volumes of the scrap material have not been calculated, it is expected that the current site is adequate for the entire mine site. If, however, this turns out to not be the case on closure, expansion of this site or selection of a new site will accommodate increased volumes.

Where permitted, the combustible wastes in this landfill area will be burned and the non-combustible debris buried under a soil cover. Final demolition and reclamation of the site will generate some non-hazardous waste material that will be disposed of in this landfill area. Once use of this site has been completed (i.e., at the end of mill and camp decommissioning), the landfill area will be covered by two compacted layers of 200 mm thick compactable soil

material obtained from local borrow sources. The cover material will be graded to prevent pooling of precipitation runoff and to encourage the shedding of water. The site would then be revegetated.

5.6.4. *Tailings Dam Foundation*

A grout curtain, designed to control seepage through the foundation of the tailings/water dam, was completed in 1998. The site is located on either side of Minto Creek and is near km 27 (LHS). Some limited disturbance of the soils adjacent to Minto Creek exists from this activity. Several covered pallets of grouting compound are stored in a staging area at the foot of the access road, upstream of the curtain.

Closure plans for this area include recontouring, scarification, and revegetation of the disturbed areas on either side of Minto Creek. In addition, the stick-ups from the grout injection holes, located on both sides of the creek, will be cut off at ground level and covered with local soils. The grout compound will also be removed from the property, or disposed of properly.

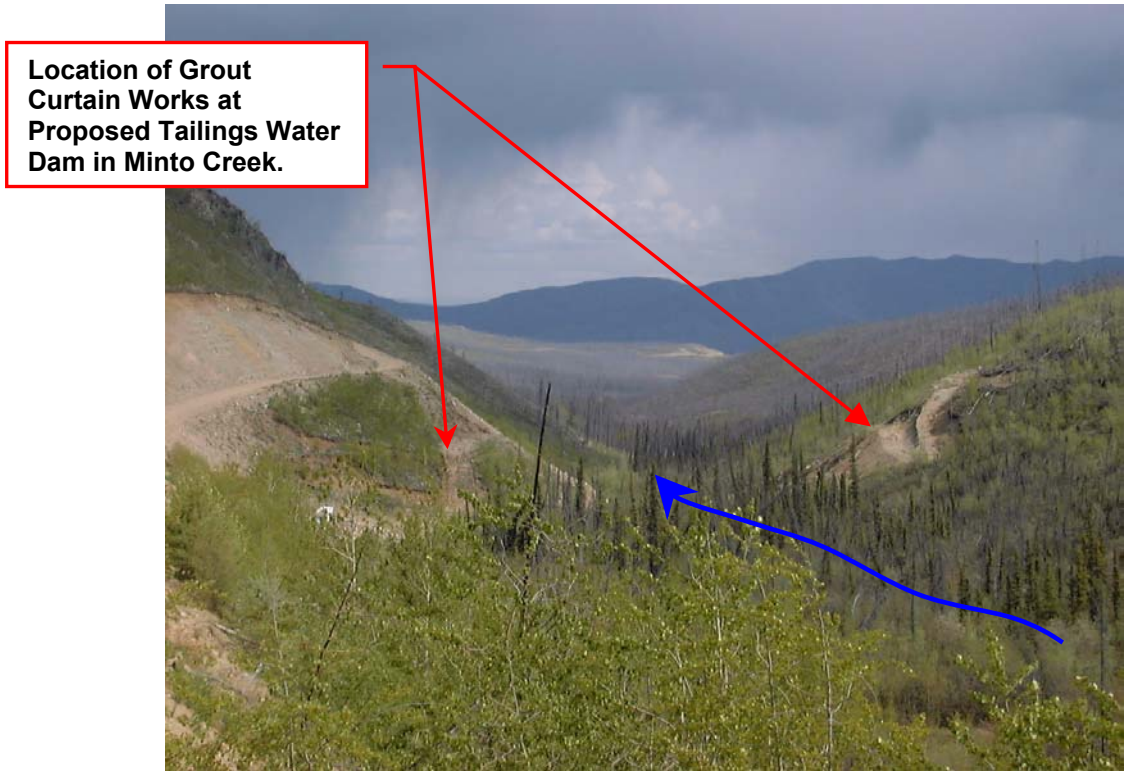


Plate 4 Proposed Location of Tailings/Water Dam (Looking Downstream on Minto Creek)

Plate 5 Grout Curtain Injection Pipes (Looking West - Upstream)

Plate 6 Grout Curtain Works Adjacent to Minto Creek (Looking South From Access Road)

5.6.5. *Explosives Magazine*

The explosives magazine (secured trailer) is located in a small borrow are located adjacent to the access road, at km 23.2. There are no explosives currently stored on the site. The trailer would be removed from the site and the area revegetated.

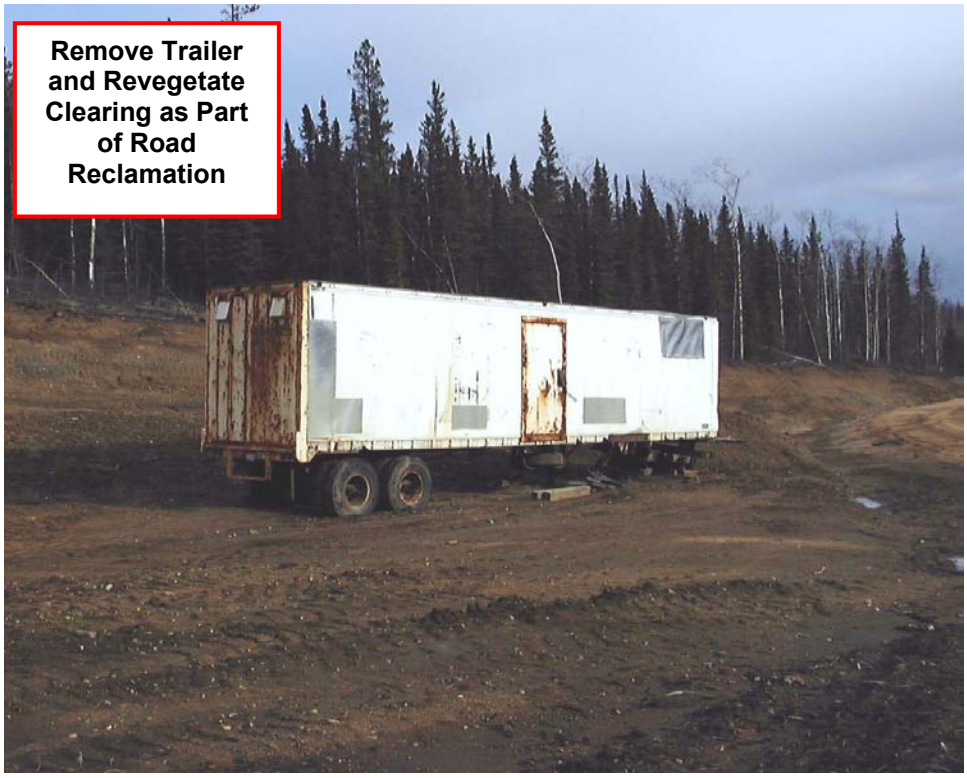


Plate 7 Explosives Magazine (Looking Northeast)

5.6.6. *Core Racks*

Core racks remain from previous exploration at the property. They are located in an old drilling area 1 km southwest of the Mill/Camp site. The core will be removed from the property for secure storage (possibly at the H.S. Bottock Core Library in Whitehorse), and the racks will be demolished and burned and/or buried. Any scrap metal or other debris will be buried at the site as part of the reclamation of this location, which entails recontouring and scarification.

Plate 8 Old Drilling Area/Core Storage (Looking East)

5.6.7. *Old Drill Sites*

The old drill sites were inspected in 2003 and no evidence of hazardous materials or of water flow or artesian conditions at any of the holes was observed. Sites will be left to revegetate naturally.

Table 5-2 summarizes the area of disturbance within the project area.

Table 5-2 Summary of Spatial Disturbance for Minto Project Property

	Component	Approach	Approximate Area of Disturbance (Hectares)
Linear Disturbances	Exploration Trails and Trenches	Natural Revegetation. Some Stabilization and Assisted Revegetation Where Required.	20.4
	Access Road	Scenario #1: No Deactivation	0
		Scenario #2: Deactivation From Mine Site to Minto Creek Crossing	40
		Scenario #3: Complete Access Road Deactivation	90
Non-Linear Disturbances	Mill and Camp	Recontour, Scarify, and Revegetate	4.7
	Airstrip	Natural Revegetation	0.6
	Tailings Dam Foundation Area	Recontour, Scarify, and Revegetate	2

Total Area in Hectares Scenario #1:	**27.7**
Total Area in Hectares Scenario #2:	**67.7**
Total Area in Hectares Scenario #3:	**117.7**

5.7 SUMMARY OF CLOSURE METHODOLOGY

Figure 5 presents an overview of the closure measures for the Mill and Campsite, specifically. Figure 6 presents an overview of the closure measures for the entire site.

Minto Project, Yukon
Care and Maintenance &
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Minto Explorations Ltd

Mill and Ancillary Facilities

- Remove camp trailers, Ball and SAG Mill, other salvageable structures, materials and infrastructure
- Burn and bury refuse
- Recontour and scarify site landings

Tailings Dam

- Cut off grout injection pipes at ground level
- Recontour and scarify
- Remove refuse

Mine Refuse Area

- Burn, bury, recontour and scarify

Old Drilling Area/Core Storage

- Recontour and scarify to promote natural revegetation

Air Strip

- Leave as is

Minto Access Road (to Barge Landing)

Minto Creek

Typical Exploration Drill Pad

Existing Exploration Trails

Minto Claims

2800

3200

3200

2200

3000

Legend

- Watercourse
- Contour Interval, 100'
- Access Road
- Mining Claims
- Existing Trail System

Overview of Mill and Camp Area Closure Measures

0.5km 1km

Scale approx 1:20 000

DRAWN BY: LDR/NS | CHECKED BY: TR

DATE: 28/08/2003

Figure 5

Yukon River

Minto Creek Crossing
· Remove culverts
· Restore streambed and banks

Explosives Magazine
· Remove from site
· Recontour and scarify

Minto Creek

Mine Refuse Area
· Burn, bury, recontour and scarify

Tailings Impoundment Dam Area
· Cut off grout injection pipes at ground level
· Recontour and scarify
· Remove refuse

Old Drilling Area/Core Storage
· Recontour and scarify to promote natural revegetation

Airstrip
· Leave as is

Mill and Ancillary Facilities
· Remove camp trailers, ball and SAG mill, other salvageable structures, materials and infrastructure
· Burn and bury refuse
· Recontour and scarify site landings

Minto Access Road
Options:
1) No Deactivation
2) Deactivate Minto Creek to Mine Site
3) Deactivate Entire Road

Dark Creek

Big Creek

Big Creek Bridge Crossing
· Remove bridge
· Pull back/crush abutments
· Restore streambank

Big Creek Bridge Landings
· Retain

Minto Landing

Highway #2

North Klondike

To Carmacks

N

1500
3000
2500

Minto Project, Yukon
Care and Maintenance &
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Legend

- Watercourse
- Contour Interval, 100'
- Access Road
- Mining Claims

Overview of Project Area
Closure Measures

1.5km 3km
Scale approx 1:82 000

ACCESS MINING CONSULTANTS LTD.

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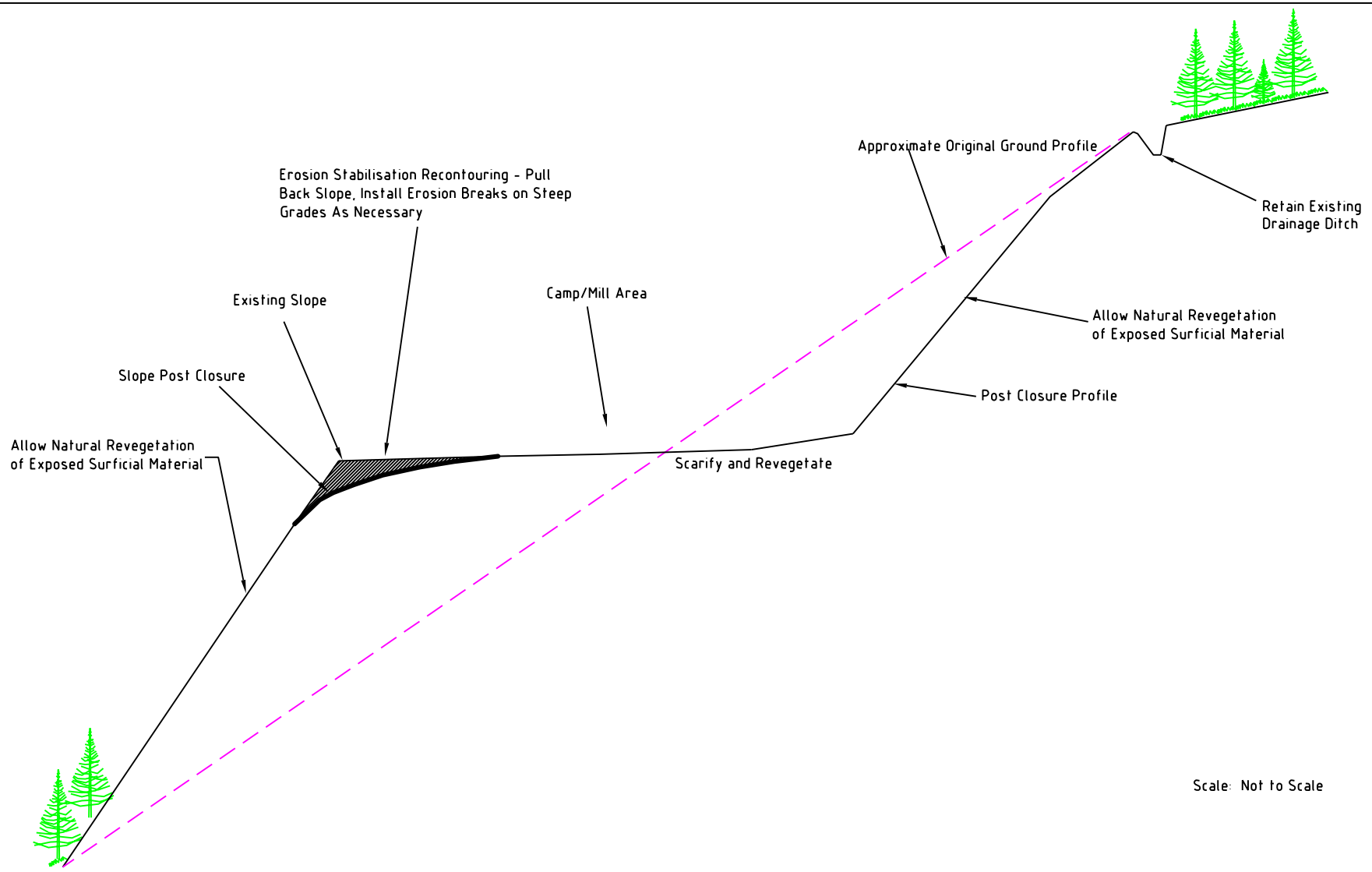
DATE: 28/08/2003

Figure 6



Minto Explorations Ltd	ACCESS MINING CONSULTANTS LTD.	Sand & Gravel Existing Vegetation	Minto Project, Yukon Care and Maintenance & Interim Closure Plan
		NOTE: DRAWING NOT FOR CONSTRUCTION - FOR ILLUSTRATIVE PURPOSES ONLY	Typical Cross-Section of Camp/Mill Area
		DRAWN BY: ASH/NS; CHECKED BY: TR; DATE: 28/08/03	Figure 7

6.0 IMPLEMENTATION SCHEDULE

For this interim Plan, it has been assumed that active mining will not occur at the mine. The timing for a final determination on whether to decommission existing site infrastructure cannot be predicted at this time as it is the intent of the Company to bring the mine into production at some point. This decision is largely dependent on metal prices, which cannot be predicted with any certainty. Mine opening remains a function of future economics.

It is anticipated that 2 years will be required to fully implement and complete all aspects of the decommissioning and reclamation works. The work would be conducted seasonally during the ice-free period (May-September). During the first year of closure, the majority of site decommissioning works would be initiated.

As one of the first steps in decommissioning the site, an environmental site assessment will be done to identify any closure issues not addressed at the time of writing this plan.

Decommissioning and final closure of the main property access road will be the last closure measure to be fully completed. A program of post closure monitoring and inspection will be carried out during the implementation of closure measures and for a 2 year period following closure. The details of the post closure-monitoring program are discussed in Section 5. The program would continue until it is demonstrated that closure objectives have been met and performance in the long term is assured.

The general schedule for closure of the mine is summarized in Table 6-1.

Table 6-1 Closure Measures Implementation Plan and Schedule

Closure Measure Sequencing	Project Element	Proposed Timing Within Year	Activity
Year 1	General	Winter (January-December)	Water Use licence Permit Acquisition for Big Creek Bridge
		Spring/Summer/Fall	General Site Clean-up/Site Audit to Confirm Site Conditions and Closure Proposed Measures
	Mill Site	Spring/Summer	Dismantle Salvageable Mill Components and Prep. For Removal From Site
	Camp Site	Spring/Summer	Dismantle Salvageable Camp Components and Prep. For Removal From Site
	Airstrip, Exploration Trails, and Trenches	Spring/Summer	Inspection for Required Reclamation
	Tailings Dam Foundation	Spring/Summer	Cutoff Grout Injection Pipe Stick-ups; Remove Salvageable Materials
Year 2	General	Winter (January-March)	Construct Ice Bridge at Yukon River And Mobilize Equipment Onto Site
		Spring/Summer/Fall	General Site Clean-up
	Mill Site	Winter (January-March)	Demobilize Salvageable Mill Components From Site
	Camp Site	Winter (January-March)	Demobilize Salvageable Camp Components From Site
	Explosive Magazine	Winter (January-March)	Demobilize Explosive Trailer From Site
	Mill Site	Spring/Summer	Stabilize and Recontour Site
			Revegetate
			Monitoring
	Camp Site	Spring/Summer	Stabilize and Recontour Site
			Revegetate
			Monitoring
	Airstrip, Exploration Trails, and Trenches	Spring/Summer	Remediation (if required)
			Reclamation Monitoring
	Tailings Dam Foundation		Stabilize, Recontour, and Revegetate Site
	Access Road	Summer/Fall	Implement Decommissioning Plan for Access Road
Year 3 (Year 1 Post Closure)	General	Winter (January-March)	Construct Ice Bridge at Yukon River and Demobilize Heavy Equipment, Bridge, and Culverts From Site
	Access Road	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Mill Site	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Camp Site	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Airstrip, Exploration Trails, and Trenches	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Tailings Dam Foundation	Spring and Fall	Reclamation Monitoring & Maintenance As Required
Year 4 (Year 2 Post Closure)	Access Road	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Mill Site	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Camp Site	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Airstrip, Exploration Trails, and Trenches	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Tailings Dam Foundation	Spring and Fall	Reclamation Monitoring & Maintenance As Required
Year 5 (Year 3 Post Closure)	Access Road	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Mill Site	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Camp Site	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Airstrip, Exploration Trails, and Trenches	Spring and Fall	Reclamation Monitoring & Maintenance As Required
	Tailings Dam Foundation	Spring and Fall	Reclamation Monitoring & Maintenance As Required

7.0 POST CLOSURE SITE MANAGEMENT

The closure phase of the Minto mine will commence with the decision to abandon efforts to bring the mine into production. During the active decommissioning phase, which is expected to last approximately 2 years, the number of personnel required will vary depending on site activities. It is, however, expected that as the major decommissioning and reclamation tasks are completed, the number of site personnel required will decline.

It is expected that a Water Use Licence will be required for the decommissioning of the main access road at Big Creek and potentially Minto Creek. Post closure management and monitoring of the site will be guided to some extent by water licence and other permit requirements. The following section provides a general outline of the site management approach that will be taken at the Minto project during the closure phase.

7.1 ORGANIZATION, SITE ACCESS & SECURITY

A number of personnel will be required on site to implement the various decommissioning and closure tasks. Generally these tasks entail closure of mill site, salvage and removal of infrastructure, decommissioning of access roads and reclamation and revegetation of disturbed lands. These activities would be undertaken on a seasonal basis and directed by an on-site manager responsible for decommissioning and reclamation of the Minto mine.

During site decommissioning, it is anticipated that the existing camp accommodations would be used on-site to support site personnel. At present, a caretaker visits the property once in winter to observe site security. The Company staff conduct two inspections of the property in the frost-free period of the year to observe site security, conduct required maintenance, and to complete the required environmental monitoring tasks. It is anticipated that this inspection schedule will continue for the period of closure (2 years) and post closure monitoring (3 years). Table 7-1 provides a summary of the personnel requirements by year for decommissioning and reclamation works. The Company is committed to having Selkirk First Nation members employed during implementation of the Interim Closure Plan.

Prior to undertaking closure activities, areas of suspected oil, chemical, or other contaminant spills will be tested to confirm locations and quantities requiring clean up.

Once decommissioning activities are completed on-site, and following a period of post closure monitoring, a determination will be made to permanently close the main site access road. Closure of the main access road is expected to be consistent with the plan's closure philosophy; however, it is recognized that the performance of physical reclamation of the site must be assured before a final determination of the main access road closure is made.

The level of access road decommissioning will be discussed first with the Selkirk First Nation. As the access road lies within Selkirk First Nation Category A settlement lands, they should determine the appropriate course of action for potential road deactivation. Government regulators and the local trapper will also be consulted regarding decommissioning plans for the road.

Table 7-1 Site Decommissioning and Reclamation Seasonal Personnel Requirements

Personnel	Closure Period Year 1	Closure Period Year 2	Post Closure Period Year 3	Post Closure Year 1	Post Closure Year 1
Construction Supervisor	1	1	1	-	-
Environmental Monitoring *	1	1	1	1	1
Equipment Operators	1	4	-	-	-
General Labourers	4	2	1	-	-
Catering Staff	-	1	-	-	-
Total Seasonal Personnel	7	9	3	1	1
Part Time Off Season Site Security/Caretaker *	1	1	1	1	1

Note: Some personnel may be contractors.
* Denotes Selkirk First Nation Band member

7.2 SUPERVISION AND DOCUMENTATION OF WORK

All decommissioning and reclamation works will be properly supervised to ensure that works are constructed according to their design, and that this work is properly carried out and documented. The project manager or the construction supervisor would supervise all closure works. Daily inspection procedures would be completed to document work progress, deficiencies and completion. Existing plans for spill response or other site internal procedures for fuel handling, waste disposal, fire control and suppression, health and safety and environmental management systems would be developed and followed as necessary.

Environmental inspections and tests conducted prior to the implementation of closure measures would be used to confirm areas requiring clean up.

For the Big Creek bridge removal and possible Minto Creek culverts, plans for all restorative works would be prepared and submitted to the YWB prior to construction. A competent environmental practitioner following standard quality control and assurance procedures would also design, direct and document this restoration work. A summary report of the works would be prepared. This report would be submitted to the YWB and regulatory agencies upon completion of closure activities.

Upon completion of the decommissioning and reclamation works, a final site plan report (summary text and drawings) would be prepared which would outline the facilities or works remaining on the site following closure. This plan would identify the location of buried concrete structures or scrap and landfill disposal areas. It is expected that this plan would accompany an Application for a Certificate of Closure under the YQMA.

7.3 MINE RECORDS

As noted in the previous section, all decommissioning and reclamation works would be documented. Other site records, files and plans would be archived. Where plans or drawings are required for mine safety reasons, these plans would also be submitted to government mine safety offices. As-built reports for structures completed for closure and the final site closure report would be retained for record and submitted to government agencies and boards.

7.4 COMPLIANCE MONITORING AND REPORTING

Environmental compliance monitoring and internal monitoring of earthworks are presently ongoing at the property. The environmental monitoring at the Minto mine employs several types of scheduled periodic inspections to ensure that the facility is meeting environmental performance objectives and complying with appropriate regulatory standards. These inspections entail:

- Scheduled semi-annual (2) summer inspections of the access road and mine/camp components by the Company staff to look at environmental hazards, site stability, and to monitor environmental conditions of the project area in general;

- Intermittent water quality sampling and flow measurements of local receiving water streams to monitor downstream environmental quality; and

- Occasional environmental tours and audits of the property.

At present, the Company staff undertakes the scheduled environmental monitoring and inspection programs. All results from the licensed compliance monitoring programs are reported to the YWB.

During the closure phase, environmental compliance monitoring and inspections will continue according to the present water use licence, utilizing seasonally site-based personnel. A summary of the present environmental compliance and inspection was presented in Table 4-2. Table 7-2 outlines the monitoring program during the two (2) year closure and three (3) year post closure monitoring periods.

Figure 2, previously presented, provides the station locations for the environmental monitoring programs.

It is expected that the amount of environmental monitoring and inspection (frequency and quantity) will decline once all closure measures have been implemented. The approach to post closure monitoring has been to continue with the present licence monitoring and inspection programs until decommissioning and reclamation measures have been completed, and then

reduce the frequency of site monitoring and the number of monitoring stations over time as satisfactory closure performance is confirmed.

The length and extent of the post closure monitoring program will be dependant upon the success of the reclamation efforts.

As previously mentioned, the Company is interested in having the Selkirk First Nation participate actively in both the closure activities and in post-closure monitoring. The Company will work directly with the First Nation in this regard.

Revisions to the current water licence requirements will be required upon closure to authorize them. Environmental monitoring and inspections conducted during the post-closure period will be undertaken by periodic visits to the site. Access to the property for post closure monitoring would be via ATV, snowmobile, and/or helicopter.

During the post closure period, reporting on all environmental and inspection programs carried out on the property will continue. These reports will be filed with the YWB and the Government of Yukon according to requirements contained in the Water Use Licence, Mine Production Licence and other operating permits and approvals as may be required.

The Company personnel responsible for the management of the Minto property would continue to meet with the Selkirk First Nation regulatory agencies, and the community on an as-needed basis to appraise interested parties of decommissioning activities and the results of post closure monitoring.

It is expected that a review of the environmental performance of the mine following closure would be made with Government of Yukon and or other interested parties. Once this review is completed, the Company would apply to the Government of Yukon for a Certificate of Closure for the Minto mine under the YQMA *Mine Production Regulations*. The Certificate of Closure will confirm that the Company has fulfilled their closure obligations for the site.

Table 7-2 Environmental Monitoring and Inspection Program - Post Closure

	Closure Timeline				
	Year 1	**Year 2**	**Year 3 (Post Closure Year 1)**	**Year 4 (Post Closure Year 2)**	**Year 5 (Post Closure Year 3)**
Environmental Monitoring					
Revegetation Success	n/a	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)
Water Quality Monitoring	Annually (Spring)	Annually (Spring)	Annually (Spring)	Annually (Spring)	Annually (Spring)
Physical Monitoring					
Non-Linear Disturbance Reclamation (Mill/Camp Site, Tailings Foundation)	n/a	Late Fall	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)
Linear Disturbance Reclamation (Access Road/Creek Crossings)	n/a	Late Fall	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)	Semi-annually (Spring and Late Summer)

8.0 CLOSURE COSTS

It is reiterated that the Company's intention is to start up the mine and bring the project into production status. As such, the Company's approach is to continue to expend funds to provide for care and maintenance of the existing infrastructure. However, in the unlikely event that no further development will occur at the site, and interim closure is initiated, cost estimates are being provided.

The estimated costs to implement the Interim Closure Plan described in this report, are presented in Tables 8-1 through 8-5. Table 8-1 presents the summary of cost estimates for various mine components including the mill foundation, campsite, access road, land reclamation and revegetation and post closure monitoring and maintenance. The salvage value of certain components of the mine, in particular the ball and SAG mill facilities and mine camp, is expected to offset some of the costs of implementing this closure plan. The site and its equipment have been, and will be, well maintained. We have not estimated the value that can be gained after expenses for the facilities and equipment at the site.

As shown in Table 8-1, a closure cost range of **$451,439** to **$632,760** is estimated for current conditions with no mine reopening, based on three separate scenarios. All costs are in constant 2003 dollars.

The costs have been developed using current unit rates for Yukon construction projects. The costs are representative of third party contractor rates, not in house. The unit costs have been applied to levels of effort in sufficient detail to allow thorough scrutiny by the reader.

- Table 8-1 provides a summary of all cost estimates;
- Table 8-2 sets out unit rates used in the calculations;
- Table 8-3 provides closure cost estimates for the existing conditions (excluding the access road decommissioning);
- Table 8-4 provides closure cost estimates for the access road; and
- Table 8-5 outlines costs associated with the site management during closure implementation and presents post closure costs for compliance monitoring and maintenance for the entire projected 5 year post closure monitoring life (These costs are common to all scenarios).

Table 8-1 Estimated Decommissioning Costs, Summary Table

Item	Description	Cost[1]
1	Exploration Trails and Trenches	$16,940
2	Mine Camp	$24,091
3	Mill Site	$22,767
4	Tailings Dam Foundation	$5,978
5	Explosives Magazine	$1,720
6	Main Access Road	See Below
7	Post Closure Site Management (Including Monitoring & Maintenance)	$338,000
	Sub-total	$392,556
	Total Estimated Closure Cost (less Access Road Decommissioning)	**$392,556**

Item	Description	Cost
6a	Scenario 1 - Leave Access Road Untouched	**$0**
6b	Scenario 2 - Decommission Main Access Road From Minto Creek to Mine Site	**$78,013**
6c	Scenario 3 - Decommission Entire Road	**$157,670**

		Plus Contingency Allowance @ 15%
Total Cost Scenario #1	**$392,556**	**$451,439**
Total Cost Scenario #2	**$470,569**	**$541,155**
Total Cost Scenario #3	**$550,226**	**$632,760**

Note:

[1] Cost estimates have included associated expenditures for mobilization and demobilization of equipment and human resources.

Table 8-2: Unit Costs

Personnel & Equipment Rates			
Equipment	**All found ***		
	Rates/hr	**Rate/mo**	**Rate/day**
D9H Dozer	$175		
Haul Truck D250E	$115		
Tandem Haul Truck	$85		
Drill Rig	$150		
36" Walk Behind Roller	$40		
Cat 235 Excavator	$140		
Cat 16H grader	$108		
Cat 988B Loader	$140		
Tractor trailer (lobed)	$85		
30 ton crane	$115		
Hiab Flatdeck truck	$75		
Rubber Tired Backhoe	$85		
Cat 950 loader	$90		
Pick up truck		$2,500	
Blaster	$50		
Labourer	$40		
Tradesman	$75		
Site Supervisor	$95		
Design Engineer	$125		
Project Manager		$8,800	
Site Caretaker		$5,500	
Environmental Monitor		$4,500	
Haul Truck D250E			

Other Materials		
Revegetation Seed Mix	$12.00	per kg
Mix #3 (Non-linear) - 17kg/ha	$204.00	per ha.
Mix #4 (Linear) - 24 kg/ha	$288.00	per ha.
Fertilizer	$1.00	per kg
Mix #3 (Non-linear) - 250 kg/ha	$250.00	per ha.
Mix #4 (Linear) - 400 kg/ha	$400.00	per ha.
Tree Seedlings	$1,500	per ha (1,000 seedlings per ha)
Seed/Fertilizer Application	$1,500	per ha
Erosion barrier	$1,500	per linear km
Mix #3 (Non-linear) Cost per ha. Including Application Cost	**$1,954.00**	**per ha.**
Mix #4 (Linear) Cost per ha. Including Application Cost	**$2,188.00**	**per ha.**

Contractor Unit Rates & Camp Costs		
Excavation of Soil	$3.50	cu.m
Supply and place Geotextile	$5.00	sq m
Place Riprap	$10.00	cu.m
Camp Cost	$100.00	per day per person

Table 8-3: Estimated Decommissioning Costs: Structures, Services, Exploration Trails

	Work Item Description	Equipment/ Labour	Units	Quantity	Unit Cost	Cost	Total Cost
	Exploration Trails and Trenches						
	stabilize slopes - erosion barriers	Unit Cost Basis	per linear km	4	$1,500	$6,000	
	Revegetation Cost	seed/fertilizer/labour	hectares	5	$2,188	$10,940	
	Subtotal:						**$16,940**
	Accommodation/Camp Trailers Buildings						
	Demobilize camp trailers, including decommissioning of septic tanks	General Labour	hrs	80	$40	$3,200	
		Trades Labour	hrs	32	$75	$2,400	
		Cat 235	hrs	10	$140	$1,400	
		tractor trailer/lobed	hrs	120	$85	$10,200	
	Reslope, contour & bury	Cat D9H	hrs	20	$175	$3,500	
	Scrap haul to landfill	Truck D250E	hrs	4	$115	$460	
	Revegetation Cost	seed/fertilizer/labour	hectares	1.5	$1,954	$2,931	
	Subtotal:						**$24,091**
	Mill Site						
	Remove salvageable equipment	General Labour	hrs	40	$40	$1,600	
	Dismantle Ball and SAG Mill	General Labour	hrs	10	$40	$400	
		30 ton crane	hrs	16	$115	$1,840	
		tractor trailer/lowbed	hrs	30	$85	$2,550	
		Trades Labour	hrs	30	$75	$2,250	
	Reslope, contour & bury	Cat D9H	hrs	30	$175	$5,250	
		Cat 235	hrs	20	$140	$2,800	
	Revegetation Cost	seed/fertilizer/labour	hectares	3.11	$1,954	$6,077	
	Subtotal:						**$22,767**
	Tailings Dam Foundation						
	Cut off Grout Injection Pipes and Remove Salvageable Material/Refuse	General Labour	hrs	8	$40	$320	
	Recontour & Scarify Site	Cat D9H	hrs	10	$175	$1,750	
	Revegetation Cost	seed/fertilizer/labour	hectares	2	$1,954	$3,908	
	Subtotal:						**$5,978**
	Explosive Magazine						
	Inspect/verify and/or remove contents	Trades Labour	hrs	16	$40	$640	
	Remove trailer	General Labour	hrs	10	$40	$400	
		Highway Tractor	hrs	8	$85	$680	
	Revegetation Cost (Included in Access Road Reclamation Costs)	n/a	n/a	n/a	n/a	n/a	
	Subtotal:						**$1,720**
Total Estimated Cost							**$71,496**

Table 8-4 Estimated Decommissioning & Reclamation Costs: Main Access Road

Scenario 1 - No Road Deactivation							**$0**
Scenario 2 - Decommission Access Road From Minto Creek to Mine Site							
	Work Item Description	**Equipment/ Labour**	**Units**	**Quantity**	**Unit Cost**	**Cost**	**Total Cost**
	Main Access Road						
	Culvert excavation	Cat 235	hrs	100	$140	$14,000	
	Culvert removal	haul truck	hrs	100	$85	$8,500	
		General Labour	hrs	140	$40	$5,600	
	Minto Creek Culvert Removal & Streambank Restoration	Trades Labour	hrs	40	$75	$3,000	
		Cat 235	hrs	40	$140	$5,600	
	Scarify	Cat 16H grader	hrs	70	$108	$7,560	
	Recontour slopes	D9H Dozer	hrs	70	$175	$12,250	
	Stabilize slopes - erosion barriers	Unit Cost Basis	per linear km	5	$1,500	$7,500	
	Revegetation Cost	Unit Cost Basis	per ha.	6.4	$2,188.00	$14,003	
	Subtotal:						**$78,013**
Total Estimated Cost							**$78,013**
Scenario 3 - Decommission Entire Access Road							
	Work Item Description	**Equipment/ Labour**	**Units**	**Quantity**	**Unit Cost**	**Cost**	**Total Cost**
	Main Access Road						
	road barrier	Misc.	l.s..			$3,000	
	culvert excavation	Cat 235	hrs	210	$140	$29,400	
	culvert removal	haul truck	hrs	100	$85	$8,500	
		General Labour	hrs	400	$40	$16,000	
	Minto Creek Culvert Removal and Restoration, Plus Big Creek Bridge Re	Trades Labour	hrs	20	$75	$1,500	
		Crane	hrs	40	$115	$4,600	
		Cat 235	hrs	40	$140	$5,600	
	scarify	Cat 16H grader	hrs	150	$150	$22,500	
	recontour slopes	D9H Dozer	hrs	150	$175	$26,250	
	stabilize slopes - erosion barriers	Unit Cost Basis	per linear km	5	$1,500	$7,500	
	Revegetation Cost	Unit Cost Basis	per ha.	15	$2,188.00	$32,820	
	Subtotal:						**$157,670**
Total Estimated Cost							**$157,670**

Table 8-5: Estimated Closure and Post Closure Site Management and Monitoring Costs

Item	Work Item Description	Equipment/ Labour	Units	Quantity	Unit Cost	Cost	Total Cost
	SITE MANAGEMENT / POST CLOSURE MONITORING						
	Site Management						
	Decommissioning Supervisor	Management	monthly	10	$8,800	$88,000	
	Camp Cost	Labour	person days	500	$100	$50,000	
	Site Security, Routine Water Sampling until end of Year 5	Labour	l.s..	5	$4,500	$22,500	
	Pre-Closure Site Environmental Audit	Contract	l.s..	1	$35,000	$35,000	
	Main Access Road Maintenance	Misc.	per year	2	$15,000	$30,000	
	Vehicles for Security & Manager	Light trucks	months	10	$2,500	$25,000	
	Misc. Office/Supply/Misc. Costs	Misc.	per year	2	$3,000	$6,000	
	Subtotal:						**$256,500**
	Supervision and Documentation of Work						
	Document Reviews/Storage	Misc.	l.s..	1	$5,000	$5,000	
	Final Decommissioning Record Drawing(s)	Person Hours	hrs	32	$125	$4,000	
	Subtotal:						**$9,000**
	Compliance Monitoring and Reporting						
	Water Quality Monitoring - During Closure Implementation & Post Closure Monitoring - analytical	Misc.	l.s..	5	$1,500	$7,500	
	Water Quality Monitoring - During Closure Implementation & Post Closure Monitoring - Disbursements (non-labour/non-analytical)	Misc.	l.s..	5	$2,000	$10,000	
	Biological Monitoring - Closure implementation	Misc.	per event	3	$10,000	$30,000	
	Subtotal:						**$47,500**
	Post Closure Maintenance						
	Misc. Maintenance work related to the site after closure	Misc.	per year	5	$5,000	$ 25,000	
	Subtotal:						**$25,000**
Total Estimated Cost in Post Closure Site Management							**$338,000**

Note: This table includes time and cost for decommissioning supervision and all professional fees related to Site Management during Closure and Post Closure activities and for monitoring.

8.1 UPDATED FINANCIAL SECURITY

The Company recognizes that based on its estimates, the bonding currently in place does not meet the revised estimates presented in this report. The Company will be proposing the bonding requirements should be re-visited to consider the revised estimates when the Company applies to renew its current water licence and mine production licence that expires on June 30, 2006. The Company also intends to discuss road decommissioning cost estimates and bonding requirements with the Selkirk First Nation in advance of the water and production licence renewal applications.

The bonding already in place for the project ($50,000) would be more than sufficient to cover the costs of the removal of any hazardous or special products at the site. The salvage value of the infrastructure on-site (camp site and ball and SAG Mill) is adequate to cover the costs of its removal from the site as well. The bulk of the remaining costs that have been identified in this plan are those involved in recontouring and reclaiming relatively benign linear and non-linear disturbances, such as the access road and the mill and campsite clearings. These elements pose negligible environmental risks on their own. In addition, a final determination regarding the fate of the access road has not yet been made. Consultations with both the Selkirk First Nation and local trappers will be required before a decision can be made in this regard and a more accurate evaluation of the final closure costs can be made. The estimated costs for road decommissioning, presented in this plan, range from 0% to almost 45% of the estimated project closure costs and are related directly to the decommissioning method that is selected.

The Company has an active care and maintenance program as previously described. The Company does not have any plans to decommission the property, and are keenly interested in expanding their investment in the project and seeing it go into production. The water use and production licencing exercises that are imminent will require review of the security requirements, and it is the desire of the Company to defer discussion on the adjustment of bonding requirements until that time.

9.0 REFERENCES

Craig, D.B., Craig, J.E., Pelletier, K., Emond, D. and Copland, H., 1998. "*Reclamation Practices and Research on Mineral Exploration Properties in the Yukon Territory".* Mineral Resources Directorate, Yukon Region, Indian & Northern Affairs Canada, 36 p.

INAC, 1992. *Mine Reclamation in Northwest Territories and Yukon*. Northern Water Resources Studies, Indian and Northern Affairs Canada.

Kennedy, C.E., Editor. 1993. *Guidelines for Reclamation/Revegetation in the Yukon*. Department of Renewable Resources, Government of Yukon, Whitehorse, Yukon.

Note: Other documents reviewed include those listed in Table 1-1 Global Information List.

Minto Explorations Ltd.

Minto Project, Yukon

Care and Maintenance & Interim Closure Plan

Appendix A

Environmental Setting

Excerpted from:

Minto Project, Yukon *Site Inspection & Compilation of Environmental Information* Prepared by Access Mining Consultants Ltd. For DIAND, Renewable Resources Waste Management Program

March 2000

4.0 ENVIRONMENTAL COMPONENTS

The following section presents a summary of environmental biophysical information for the project area. Where available, additional data has been used and incorporated to present the current knowledge of the area.

4.1 CLIMATE

A basic meteorological station was established at the mine site in 1993 (elevation: 884 m, 2900 ft). Only intermittent temperature and precipitation data is available (September–October 1993 and June-August 1994). Meteorological information for the Project area was collected manually and consisted of snow surveys and a weather station that measured precipitation and temperature. Due to the paucity of site specific climatic information, long-term synthetic data for various parameters was generated using regional information from the Pelly Ranch (Fort Selkirk) monitoring station. This information is presented in greater detail in Volume II of the Initial Environmental Evaluation prepared by Hallam Knight Piesold, (HKP, 1994).

Temperatures at the mine site are typical of northern inland climates, having low average temperatures and seasonal extreme low temperatures. Precipitation levels are described as moderate. The meteorological database for the Project area is limited. Table 1 presents a summary of key meteorological information for the Project area.

Table 1 Minto Project Area Meteorological Information

Site Elevation	716 to 793 (m)
Regional Station Used To Generate Synthetic Data	Pelly Ranch
Distance to Carmacks Climate Station [Elevation of 525 m]	80 km southeast
Distance to Pelly Ranch (Fort Selkirk) Climate Station [Elevation of 454 m]	20 km northwest
Mean Monthly Temperature Range	-30.9°C to 12.1°C
Annual Mean Temperature	-7.3°C
Orographic Factors	Long-term synthetic values for mean annual precipitation generated using an orographic factor of + 8% per 100 m elevation gain using Pelly Ranch as basis
Annual Precipitation	378 mm
Precipitation as Snow	157 mm (41.5%)
Precipitation as Rain	221 mm (58.5%)
Probable Maximum 24-hour Precipitation	183 mm
Snowmelt Periods	80% April, 20% May
Mean Annual Pond Evaporation	409mm

Note: Pelly Ranch data was chosen as the basis for analysis because of the close proximity of the meteorological station and the Project site, a reasonable correlation between station and site precipitation records, and a reasonable correlation between station precipitation and site runoff.

4.2 TERRESTRIAL RESOURCES

4.2.1 Surficial Geology / Terrain Hazards

The following discussion of terrain hazards at the Minto Project Site was taken directly from Volume II of Hallam Knight Piesold's Initial Environmental Assessment, 1994.

Surficial Geology

The Minto area is considered part of the Pelly River Ecoregion and lies within the Dawson Range on the west side of the Klondike Plateau. Erosion surfaces are dissected by narrow stream valleys. The topography is gently rolling with relief up

to 2000 ft (600 m). The ore body is located beneath a small stream valley, known as Minto Creek, and extends beneath the toe of the south-facing slope on the left hand side of the creek. The bottom of the valley in the region of the ore body is at an elevation of approximately 2650 ft (922 m). On either side of Minto Creek, the topography rises at slopes generally of approximately 20° to the rounded tops of the surrounding hills which are at a maximum elevation of 3250 ft (1131 m). The site is located within the discontinuous widespread permafrost subzone and extensive areas within the general region are underlain by permafrost. Permafrost is extensively distributed throughout the site with the majority located on north aspect slopes. Within the area of the open pit, overburden has been measured to be as thick at 280 feet (85.3 m) with permafrost extending to a depth of 60 feet (18.3 m).

The area west of the Yukon River and north of Carmacks, including the Minto area, was not covered during the last continental glaciation (Wisconsin Drift) and as a result, glacial till soils are not present. However, a study by Bostock (1970) on the glaciation of central Yukon indicates that two older drifts, the Klaza and Reid Advances may have partially encroached on the upper region of Minto Creek. Gravel deposits, terraces and few erratics indicate that glaciation extended above 3000 ft (1044 m), from south of the mouth of Dark Creek, north to Wolverine Creek. Due to the lack of glaciation, bedrock exposure is poor and generally limited to the tops of ridges where it forms blocky, castellated outcrops.

Soils in the Minto area have developed from saprolite, colluvial and fluvial parent materials. Where drainage is impeded, gleysols or gleyed brunisols tend to develop. On well drained materials, eutric or dystric brunisols predominate, although some podzols may also occur. Regosols may occur on recent fluvial deposits.

The predominant bedrock type in the development area is granodiorite; derived materials are generally coarse textured, basic, well to moderately drained, and have low inherent fertility. Organic content in soils is expected to be low except in the upper few centimeters.

Overburden within the plant site consists predominantly of micaceous, organic, silty sand and of sand and fine gravel, derived predominantly through *in situ* weathering of the upper surface of the bedrock. Bedrock is encountered at depths of 2 to 11 feet (0.7 to 3.8 m) below surface. Overburden in the vicinity of the proposed open pit has a maximum thickness of 280 feet (97.4 m). Soils consist of frozen micaceous silt and fine sand with varying amounts of organic constituents throughout. Overburden in the vicinity of the tailings storage facility also consists of frozen silts and sands and is approximately 200 feet (96 m) in thickness. Overburden material is described as consisting of 30% fine gravels, 40% coarse sands and 10% medium sands. In all cases, the overburden is covered by a moss and topsoil layer. Bedrock below these layers is granodiorite.

Debris Flow

Solifluction is slow downward movement (mud flow or creep) of water-saturated, near surface soil and surface vegetation from higher to lower elevations. Solifluction areas on the Minto Project site are underlain at shallow depth by permafrost, which retards subsurface drainage. The active layer becomes saturated with surface and shallow subsurface drainage from the adjacent slopes. When subjected to these conditions, the active layer creeps during the spring and summer months, even on very gentle slopes. This slow downslope creep of the saturated surface mantle is commonly referred to as solifluction.

Slope Stability

South aspect scree slopes in lower Minto Creek are comprised of a minimal vegetative layer consisting of grasses and some low growing shrubs such a kinnikinnick, juniper and soopalallie. Active erosion was observed in these areas. Extensive regions of burn, combined with steep slopes, thin overburden layers and solifluction may result in some north aspect slopes being unstable during the spring thaw and summer months.

Avalanche Hazard

The Minto Project is within an area that receives very low levels of precipitation. Regionally, snowfall averages 185 mm annually. The potential for the occurrence of an avalanche are very low.

Forest Fires

Due to the dry climate and frequent electrical storm events that occur in the summer months, forest fires are very common in the Minto area. Many areas are in varying degrees of seral succession of vegetation. Two burns have occurred in the Minto Creek watershed between 1950 and 1980, and two further burns since 1980.

Permafrost

The Minto Project lies in the southerly boundary of the discontinuous permafrost zone. From site investigations by Golder (1976), it was determined that permafrost is extensively distributed throughout the site with the majority located on north aspect slopes. Within the area of the open pit, overburden has been measured to be as thick as 280 feet (85.3 m) with permafrost extending to a depth of 60 feet (18.3 m). A significant percentage of the permafrost is clear segregated ice with water content close to the liquid limit and will not be suitable as construction material. Permafrost of the same sort is found within the proposed tailings and waste rock storage areas.

4.2.2 Wildlife and Waterfowl

Information on wildlife in the Project area has been gathered from various sources including the IEE for the Minto Project (prepared by Hallam Knight Piesold, 1994), YTG-Renewable Resources, and other reports on the Project and surrounding area. Additional information was provided by the SFN and other local residents, as part of data gathered from First Nation interviews.

Numerous aerial and ground surveys were conducted in 1994 by Hallam Knight Piesold. Some were conducted in association with the Yukon Territorial Government, Fish and Wildlife Branch of Renewable Resources. In general, it was noted during these surveys that wildlife distributions follow vegetation zone classifications. Three distinct habitat classifications, based on the predominant vegetation communities, exist in the Minto Project area. These include: mixed coniferous/deciduous forest zone, black spruce/willow/sedge zone, and areas of regenerative forests.

Wildlife species likely to be present within the Minto Project area are presented in Table 2. Although not all of these species were observed in the 1994 surveys it is suggested, by the availability of habitat and historical record, that these species are likely to be present at one time or another. This information was also confirmed during SFN interviews.

The Project area does not likely contain key habitat for either moose or caribou. However, moose utilization of the area has been reported. Moose may use new vegetative growth in the extensive burn areas for feeding during the growing season, and occasionally foraging on tall shrubs during the winter. The low-gradient areas near the Yukon River, including the area through which the access road passes, may also provide foraging habitat. Moose are also known to use some islands of the Yukon River for calving. YTG-Renewable Resources estimates the local density of moose to be approximately 40 moose/1000 km^2.

Migration corridors have been qualified as key habitat for woodland caribou. Populations of these ungulates in the region are represented by the Klaza and the Tatchun/Glenyon herds. Key winter range habitat has been identified for the Klaza herd in the headwaters of Big Creek, some 15 km west of the Project. The herd is consists of approximately 955 animals (1994 estimate). The results of radio collaring/tracking and home range mapping by YTG-Renewable Resources suggests that the herd does not enter the Minto Project area. However the Tatchun/Glenyon herd maintains a home range that may intersect portions of the access road.

Mule deer are designated as ‘specially protected wildlife’ due to their low abundance in the Yukon. Mule deer are commonly found in burn areas and south aspect slopes. Physical observations of Mule deer presence, in the Project area, has been limited to two groups of pellets observed in the vicinity of Minto Creek in 1994.

A population of Dall sheep inhabit the east bank of the Yukon river between Minto Landing and the Pelly River confluence. This area is considered key winter habitat for the species. It is anticipated that the Minto Project will have no significant effects upon this sheep population as no Project activities occur in this area.

Table 2 Wildlife Species in the Vicinity of the Minto Project Area

Ungulates	
Moose	*Alces alces*
Woodland caribou	*Rangifer tarandus*
Dall sheep	*Ovis dalli dalli*
Mule deer	*Odocoileus hemionus*
Carnivores and Furbearers	
Grizzly bear	*Ursus horribilis*
Black bear	*Ursus americanus*
Coyote	*Canis latrans*
Wolf	*Canis lupus*
Lynx	*Lynx canadensis*
Red fox	*Vulpes vulpes*
Wolverine	*Gulo luscus*
Marten	*Martes americana*
Least weasel	*Mustela rixosa*
Mink	*Mustela vison*
Muskrat	*Ondantra zibethicus*
River otter	*Lutra canadensis*
Beaver	*Castor canadensis*
Squirrel	*Tamiascurus hudsonieus*
Snowshoe hare	*Lepus americanus*
Game Birds	
Spruce grouse	*Dendragapus canadensis*
Ruffed grouse	*Bonada umbellus*
Sharp-tailed grouse	*Tympanuchus phasianellus*
Willow ptarmigan	*Lagopus lagopus*
White-tailed ptarmigan	*Lagopus leucurus*
Rock ptarmigan	*Lagopus mutus*
Canada goose	*Branta canadensis*
Mallard duck	*Anas platyrhynchos*
Northern pintail	*Anas acuta*
Green-winged teal	*Anas crecca*
American widgeon	*Anas americana*

Adapted from Table 10.1 (Minto Explorations Ltd. IEE, *Volume II Environmental Setting)*

Large carnivores, such as bears and wolves have been observed in the Project area. A female grizzly with two cubs has been observed in the upper Minto Creek drainage, Black bears have been sighted in the lower Minto Creek watershed during the summer months. A variety of smaller furbearers can also be found associated with the various Project area habitats. This is consistent with the observation of continued trapping in the area.

Big Game harvest levels and the trapping and outfitting concessions in the Project area are shown in Figure 8.

Waterfowl are not known to use the Project area for any length of time due to the lack of suitable habitat (i.e. wetlands). However, key habitat for waterfowl does exist in the area of the Wilczek Lakes, approximately 30 km east of the Project area (Hallam Knight Piesold, 1994).

SFN members do however confirm that a large number of waterfowl do inhabit the slough and wetland areas along the Yukon River. Other game birds are found in the Project area, with specific sightings of sharp-tailed grouse and spruce grouse. Raptors in the area primarily utilize the Yukon River Corridor, as there is a lack of suitable alpine habitat in the Project area. One pair Peregrine Falcons (listed in Canada as 'endangered') is currently known to utilize the Yukon River near the Minto Project area. The Yukon River shores are also home to eagles and osprey, with eagles nests reported near the Project area along the Yukon River.

4.2.3 Vegetation

The Minto Project lies within the Yukon Plateau (Central) Ecozone/Pelly River Ecoregion. The area forest types commonly include Black and white spruce, paper birch (cooler sites), aspen and balsam poplar (disturbed sites - pioneering species), and lodgepole pine (frequently in competition with deciduous species in burned areas). Mosses dominate coniferous forest floors, with willows and ericaceous shrubs becoming more prevalent as forest stand density decreases. Lichens tend to dominate in rocky Alpine areas. Alpine areas begin at elevations of 1350-1500 m. Sedges and tussocks occur in moist, low-gradient areas and under Black spruce, which also thrive in moist substrates.

The first 10-18 kilometers of the Project access road traverses a low gradient, moist habitat, as discussed above (associated with the ancient Yukon River floodplain). The remaining portion of the road ascends the Minto Creek drainage, terminating in the sub-alpine/alpine reaches of the

watershed. It is here that the local forests are regenerating as a result of successive forest fires. The Minto Project area has been burned by four separate forest fires over the last 40 years. The upper Minto Creek area was burned in 1980, while another fire occurred in 1995 in the lower Minto Creek area (within 300m of the confluence with the Yukon River). Figure 6 outlines the extent of burn areas as a result of various forest fires. Vegetation surveys and mapping were completed as art of the IEE (HKP, 1994). No further vegetation studies have been completed in the Project area, although MEL has initiated a test re-vegetation program as part of the company's reclamation efforts.

4.3 HYDROLOGY AND WATER QUALITY

4.3.1 Surface Water Hydrology and Water Quality

Hydrological and water quality information for the Project area has been collected by B.C. Research and Environment Canada (1975-1976). Further data was collected by Hallam Knight Piesold from 1993-1995. Additional hydrological and water quality data is now being collected by MEL as part of their Water Use Licence (QZ96-006) surveillance network. Figure 5 provides the location of these monitoring stations.

Although of limited quantity, the water quality data base appears to show some similarity across sampling events. Historical water quality monitoring data exists for Minto Creek, Big Creek, Unnamed Creek A & B, Wolverine Creek, and the Yukon River. These water samples were collected and analyzed on several occasions during 1975 and 1976 (conducted by B.C. Research and Environment Canada). Water quality data collected during the Initial Environmental Evaluation consists of several sampling occasions from September 1993 to October 1995, primarily on Minto Creek (MEL & DIAND). Further data was collected by Minto Explorations in 1998 as part of the monitoring requirements of their Water Use Licence (QZ96-006). Two water quality monitoring stations were sampled in Minto Creek during the October, 1999 inspection to document existing stream chemistry prior to full scale mine production in the area.

During the course of the environmental data compilation, little information or data was found regarding Yukon River winter ice conditions at Minto Landing, the site of the proposed winter ice bridge crossing.

4.3.1.1 MINTO CREEK

Minto Creek is an ephemeral watercourse with a mainstream length of approximately 17km. Three staff gauges were installed along Minto Creek (at Environmental Monitoring Stations W1, W2 & W3) to gather baseline hydrological information. During a fishery survey in 1994, the watercourse was divided up into seven (7) reaches (Minto Explorations Ltd., IEE Volume II). Lower reaches of the watercourse show lower flows than the upper reaches. This is presumably due to reduced runoff retention times in the upper regions of the drainage as a result of the burn areas and also due to the high streambed infiltration that occurs within the lower reaches.

Hydrological studies conducted as part of the 1994 IEE, by Hallam Knight Piesold also indicate that a significant amount of infiltration of Minto Creek flow is occurring in the upper reaches of the watershed. Up to 75% of the surface runoff may be entering the subsurface regime, resulting in a large amount of attenuation. As such, a reasonable estimate of maximum flow that would be expected at the Minto Creek crossing of the access road at km 15.7 is approximately 5 m^3/sec. This compares to a 1:100 year flood event, assuming approximately 50% surface flow is lost to upstream subsurface attenuation (Minto Explorations Ltd., IEE Volume II).

In the absence of long-term and complete records of streamflow for the study area streams, a regional hydrological analysis was completed using a combination of data collected on site and data collected at the hydrometric networks of the Water Survey of Canada (WSC) and the Water Resources Division of DIAND. Regional streamflow and precipitation records were used to generate synthetic long-term flow values (Minto Project IEE Volume II, 1994). Hydrological information gathered on Minto Creek is presented in Table 3. Table 4 presents the seasonal streamflow distributions for Minto Creek.

The existing Water Use License (QZ96-006) requires flow monitoring at a number of stations in the Minto Creek drainage. During the October, 1999 site inspection, flow monitoring station W2 was found in a state of disrepair.

Table 3 Measured Minto Creek Streamflow Data

Gauge Location	Catchment Area (km^2)	Mean Basin Elevation (m)	Flow (m^3/s)					Unit Area Flow (mm)				
			29-Sep-93	15-May-94	5-Jun-94	7-Jul-94	11-Aug-94	29-Sep-93	15-May-94	5-Jun-94	7-Jul-94	11-Aug-94
Minto Creek (Station W1)	4.75	885	0.035	0.119	0.029	0.042	0.005	0.637	2.165	0.527	0.764	0.091
Minto Creek (Station W3)	10.38	-	0.028	0.101	0.029	0.04	0.011	0.236	0.841	0.241	0.333	0.092
Minto Creek (Station W2)	42.18	775	0.06	0.312	0.061	0.095	n/a	0.123	0.639	0.125	0.195	n/a

Streamflow data adapted from Table 4.2 (Minto Explorations Ltd. IEE, Volume II Environmental Setting)

Table 4 Minto Creek Seasonal Streamflow Distributions (Measured and generated long-term values)

Environmental Monitoring Station	Years of Record	unit	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
Big Creek (WSC Site #09AH003)	1975-83, 1984-93	m^3/s	0.30	0.20	0.10	2.00	26.80	17.30	19.40	13.30	10.00	3.80	1.30	0.60	7.90
		mm	0.40	0.20	0.20	2.90	40.40	26.00	29.20	20.00	15.00	5.80	1.90	0.90	143.00
		%	0.30	0.20	0.20	2.10	28.20	18.20	20.40	14.00	10.50	4.00	1.30	0.60	100.00
Minto Creek Station W2 (measured)	1994	m^3/s	-	-	-	-	-	0.10	0.04	0.04	0.02	-	-	-	-
		mm		-	-	-	-	6.50	2.60	2.30	1.40	-	-	-	-
Minto Creek Station W2 (estimated)	1994	m^3/s	-	-	-	-	-	0.09	0.06	0.01	0.03	-	-	-	-
		mm	-	-	-	-	-	5.60	3.80	0.90	2.20	-	-	-	-
Minto Creek Station W2 (estimated)	Synthetic Long-term	m^3/s	0.00	0.00	0.00	0.20	0.09	0.06	0.09	0.06	0.04	0.00	0.00	0.00	0.05
		mm	0.00	0.00	0.00	12.00	5.00	4.00	5.00	4.00	3.00	0.00	0.00	0.00	34.00
		%	0.00	0.00	0.00	37.00	16.00	11.00	16.00	10.00	8.00	1.00	0.00	0.00	100.00

Streamflow distribution data adapted from Table 4.4 (Minto Explorations Ltd. IEE, Volume II Environmental Setting)

Table 5 presents the results of water quality analysis conducted as a part of the 1999 site inspection, as well as the water quality data from the 1998-1999 Annual Report to the Yukon Territory Water Board for water use licence QZ96-006 (for Minto Creek water quality monitoring sites W2 and W3 only). Water quality monitoring data collected at other locations in the Project area have been included in its entirety, as Appendix A. Figure 5 shows the current and historic environmental monitoring sites.

Water quality in the Minto Creek drainage is characterized as neutral to slightly basic pH, moderately hard, moderately high in total suspended and dissolved solids, and moderately to highly conductive. Concentrations of anions, nutrients, and cyanide/cyanogen-like compounds have been found to be moderate to high. Metal concentrations are generally moderately high with iron, copper, and aluminum present in high concentrations and in exceedance of the CCME Guidelines for the Protection of Freshwater Aquatic Life, particularly in the upper reaches of Minto Creek near the orebody (Minto Project IEE Volume II, 1994) (CCME, 1999)

Water quality samples were collected at Station W3 – Upper Minto Creek and the lower reach of Minto Creek, Station W2 on October 13, 1999 (Figure 5). Samples were analyzed for physical parameters, nutrients, residues, total and dissolved metals, and shipped for analysis to Norwest Labs of Vancouver the following day. Water samples taken during the October 1999 site inspection showed elevated concentrations for nutrients and metal concentrations, with cadmium, copper, iron, and selenium again exceeding CCME concentrations for the protection of freshwater aquatic life. These water quality results are consistent with previous sampling results; however, higher metal concentrations were encountered at W2 (lower Minto Creek) as opposed to W3 (upper Minto Creek).

Table 5 Minto Creek Water Quality

	Location												
	W2	W2	W2	W2	W2	W2	W2	W3	W3	W3	W3	W3	CCME Guideline
	Minto IEE*	DIAND*	DIAND*	MAR*	MAR*	ACG*	**MEAN**	Minto IEE*	DIAND*	DIAND*	ACG*	**MEAN**	
	1993-94	15-Jun-95	25-Jul-95	2-May-98	9-Aug-98	13-Oct-99		1993-94	15-Jun-95	25-Jul-95	13-Oct-99		
Physical Tests													
Conductivity (microS/cm)	185.7		174.0	127.0	247.0	220.0	190.7	239.4	337.0	297.0	300.0	293.4	
Hardness (mg/l)	93.4		114.0	65.5	145.0		104.5	113.1	173.0	176.0		154.0	
Turbidity (NTU)	18.4		5.0				11.7	33.0	0.4	1.0		11.5	
Water Analysis (mg/l)													
Total Alkalinity	86.5		85.0	54.0	123.0	97.0	89.1	105.3	148.0	132.0	112.0	124.3	
Ammonium-N	0.0052		0.002			0.001	0.0036	0.0157	0.005	0.002	0.001	0.00757	
Chloride (dissolved)	1.07						1.07	1.2	1.0			1.10000	
Fluoride (dissolved)	0.203						0.203	0.162	0.26			0.211	
Sulphate (dissolved)	13.7		15.0				14.35	20.32	35.4	21.0		25.57	
Nitrate-N (+ Nitrite-N)	0.0339		0.016	0.005	0.094	0.25	0.09848	0.0602	0.043	0.054	0.12	0.0693	
Nitrite Nitrogen	0.0029			0.008	0.001		0.00397	0.005	0.002			0.0035	0.06
pH (units)	7.8		8.0	7.6	7.7	7.8	7.8	7.9	8.1	8.1	7.9	8.0	0.0065-0.009
Phosphorus-Orthophosphate	0.0083					0.19	0.09915	0.0166	0.002		0.19	0.06953	
Total Dissolved Phosphate	0.0155						0.0155	0.0256	0.006			0.0158	
Total Phosphorus	0.0573		0.058				0.05765	0.068	0.01	0.014		0.03067	
Total Dissolved Solids	125.8			100.0	179.0	161.0	141.5	154.0				154.0	
Total Suspended Solids	42.0		20.0	150.0	1.0	31.0	48.8	85.4	248.0	5.0		112.8	
Dissolved Parameters (mg/l)													
Dissolved Organic Carbon	27.2							20.9				20.9	
Total Organic Carbon	18.9					12.1	15.5	16.1	9.1		11.8	12.3	
Total Metals (mg/l)													
Aluminum (Al)	0.948	0.084	0.901	0.8	0.2	0.35	0.6166	1.9520	0.026	0.186	0.12	0.571	
Antimony (Sb)	0.0001	0.0001	0.0004	0.2	0.2	0.02	0.0002	0.0001	0.0001	0.0004	0.02	0.0002	
Arsenic (As)	0.0009	0.0003	0.0007	**0.2**	**0.2**	**0.02**	0.0006	0.0014	0.0003	0.0004	**0.02**	0.0007	0.005
Barium (Ba)	0.0678	0.058	0.0676	0.06	0.06	0.0546	0.0613	0.1048	0.059	0.0558	0.0523	0.068	
Beryllium (Be)	0.0025	0.005	0.0001	0.005	0.005	0.0002	0.0025	0.0025	0.005	0.0001	0.0002	0.0025	
Bismuth (Bi)	0.05	0.1	0.0001	0.1	0.1	0.02	0.05	0.05	0.1	0.0001	0.02	0.05	
Boron (B)	0.107	0.1		0.1	0.1	0.04	0.0823	0.112	0.1		0.03	0.0807	
Cadmium (Cd)	**0.0001**	**0.0002**	**0.0001**	**0.01**	**0.01**	**0.0005**	**0.0001**	**0.0001**	**0.0002**	**0.0001**	**0.0005**	**0.0001**	0.000017
Calcium (Ca)	24.77	32.5	33.1	16.3	34.7	27.7	28.1783	29.28	42.0	48.0	35.8	38.77	
Chromium (Cr)	0.0026	0.001	0.0026	**0.01**	**0.01**	**0.001**	0.0021	0.0042	0.001	0.0006	0.001	0.0017	0.0089
Cobalt (Co)	0.0009	0.001	0.001	0.01	0.01	0.001	0.001	0.0016	0.001	0.0002	0.001	0.0009	
Copper (Cu)	**0.008**	0.003	**0.005**	**0.01**	**0.01**	**0.0120**	**0.007**	**0.019**		**0.004**	**0.01**	**0.011**	0.003
Iron (Fe)	**1.834**	0.087	**0.357**	**1.49**	0.17	**0.73**	**0.778**	**4.064**	0.046	0.1400	0.195	**1.1113**	0.3
Lead (Pb)	0.0022	0.001	0.0002	**0.05**	**0.05**	**0.005**	0.0011	**0.0048**	0.001	0.0002	**0.005**	0.002	0.004
Lithium (Li)			0.0016	0.01	0.01	0.003	0.0023			0.001	0.005	0.003	
Magnesium (Mg)	8.3	11.1	7.7	6.0	11.3	8.6	8.8	11.2	15.8	13.5	13.6	13.5	
Manganese (Mn)	0.066	0.0110	0.0804	0.088	0.034	0.0502	0.0549	0.2376	0.027	0.0287	0.0143	0.0769	

Table 5 Minto Creek Water Quality

	Location												
	W2	W2	W2	W2	W2	W2	W2	W3	W3	W3	W3	W3	CCME Guideline
	Minto IEE*	DIAND*	DIAND*	MAR*	MAR*	ACG*	**MEAN**	Minto IEE*	DIAND*	DIAND*	ACG*	**MEAN**	
	1993-94	15-Jun-95	25-Jul-95	2-May-98	9-Aug-98	13-Oct-99		1993-94	15-Jun-95	25-Jul-95	13-Oct-99		
Mercury (Hg)	0.00001	0.00001	0.00002				0.00001	0.00001	0.00001	0.00002		0.00001	0.001
Molybdenum (Mo)	0.0006	0.0050	0.001	0.05	0.03	0.005	0.0153	0.0014	0.004	0.002	0.005	0.0031	0.073
Nickel (Ni)	0.004	0.0010	0.0031	0.05	0.05	0.002	0.0025	0.007	0.001	0.0019	0.002	0.0033	0.025-0.15
Phosphorus			0.06	0.3	0.3	0.06	0.06			0.01	0.06	0.01	
Potassium (K)			0.98	2	2	1.0	0.99			1.00	1.1	1.05	
Selenium (Se)	0.0003	0.0005	**0.01**	**0.2**	**0.2**	**0.02**	**0.0036**	0.0003	0.0005	**0.01**	**0.02**	**0.0036**	0.001
Silicon (Si)	6.3	4.7	0.0	4.9	5.3	6.4	4.6	7.7	4.9		6.1	6.3	
Silver (Ag)	0.0001	0.0001	0.0001	**0.01**	**0.01**	**0.001**	0.0001	0.0001	0.0001	0.0001	0.001	0.0003	0.001
Sodium (Na)			4.51	3.0	7.0	5.46	4.9925			8.9	8.91	8.905	
Strontium (Sr)	0.1942	0.289	0.213	0.129	0.321	0.219	0.2275	0.206	0.334	0.266	0.282	0.272	
Sulphur (S)						4.1	4.1				11.2	11.2	
Thallium (Tl)			0.001	0.2	0.2	0.003	0.001			0.0001	0.003	0.003	
Thorium (Th)						0.005	0.005				0.005	0.005	
Tin (Sn)				0.03	0.03	0.005	0.005				0.005	0.05	
Titanium (Ti)		0.01		0.03	0.01	0.013	0.0177		0.01		0.013	0.0115	
Uranium	0.0004	0.001				0.06	0.0007	0.0005	0.0018		0.06	0.0011	
Vanadium (V)	0.015	0.03	0.003	0.03	0.03	0.003	0.0128	0.015	0.03	0.001	0.003	0.0123	
Zinc (Zn)	0.0061	0.005	0.01	0.013	0.005	0.003	0.0074	0.0108	0.005	0.005	0.003	0.006	0.03
Zirconium (Zr)						0.001	0.001				0.001	0.001	
Dissolved Metals (mg/l)													
Aluminum (Al)	0.0335	0.019	0.065			0.02	0.0344	0.0422	0.018	0.01	0.02	0.0226	
Antimony (Sb)	0.0001	0.0001	0.0005			0.02	0.0002	0.0001	0.0001	0.0004	0.02	0.0002	
Arsenic (As)	0.0004	0.0003	0.4			0.02	0.1336	0.0004	0.0003	0.0003	0.02	0.0003	
Barium (Ba)	0.0457	0.059	0.0458			0.0448	0.0488	0.0576	0.059	0.0501	0.0523	0.0548	
Beryllium (Be)	0.0025	0.005	0.0001			0.0002	0.0025	0.0025	0.005	0.0001	0.0002	0.0025	
Bismuth (Bi)	0.05	0.1	0.001			0.02	0.0503	0.05	0.1	0.0001	0.02	0.05	
Boron (B)	0.05	0.1				0.01	0.053	0.05	0.1		0.01	0.053	
Cadmium (Cd)	0.0001	0.0002	0.0001			0.0005	0.0001	0.0001	0.0002	0.0001	0.0005	0.0001	
Calcium (Ca)	24.2	32.4	19.5			27.5	25.9	28.0	42.9	29.3	35.8	34.0	
Chromium (Cr)	0.0005	0.001	0.0016			0.001	0.001	0.0005	0.001	0.0014	0.001	0.001	
Cobalt (Co)	0.0005	0.001	0.0001			0.001	0.0005	0.0005	0.001	0.0002	0.001	0.0006	
Copper (Cu)	0.0038	0.003	0.003			0.003	0.0032	0.0056	0.003	0.004	0.005	0.0044	
Iron (Fe)	0.3393	0.032	0.099			0.139	0.1523	0.7596	0.038	0.093	0.09	0.2452	
Lead (Pb)	0.0005	0.001	0.0002			0.005	0.0006	0.0005	0.001	0.0002	0.005	0.0006	
Lithium (Li)			0.0013			0.002	0.0017			0.001	0.003	0.002	
Magnesium (Mg)	8.0	11.1	7.3			8.4	8.7	10.5	16.1	12.9	13.6	13.3	
Manganese (Mn)	0.0148	0.006	0.0122			0.0087	0.0104	0.137	0.025	0.0136	0.0114	0.0468	
Molybdenum (Mo)	0.0005	0.001	0.001			0.005	0.0008	0.001	0.001	0.002	0.005	0.0013	
Nickel (Ni)	0.001	0.001	0.0023			0.002	0.0014	0.0011	0.001	0.0017	0.002	0.0013	

Table 5 Minto Creek Water Quality

	Location												
	W2	W2	W2	W2	W2	W2	W2	W3	W3	W3	W3	W3	CCME Guideline
	Minto IEE*	DIAND*	DIAND*	MAR*	MAR*	ACG*	**MEAN**	Minto IEE*	DIAND*	DIAND*	ACG*	**MEAN**	
	1993-94	15-Jun-95	25-Jul-95	2-May-98	9-Aug-98	13-Oct-99		1993-94	15-Jun-95	25-Jul-95	13-Oct-99		
Phosphorus						0.06	0.06				0.06	0.06	
Potassium (K)	0.823	1.37	1.0			1.0	1.0483	0.888	1.5	1.0	1.1	1.122	
Selenium (Se)	0.0003	0.0005	0.01			0.02	0.0036	0.0003	0.0005	0.01	0.02	0.0036	
Silicon (Si)	5.0	4.7				6.0	5.2	5.2	5.0		6.0	5.4	
Silver (Ag)	0.0001	0.0001	0.0001			0.001	0.0001	0.0001	0.0001	0.0001	0.001	0.0001	
Sodium (Na)	4.8	7.8	4.5			5.5	5.6	6.7	11.6	8.6	8.9	9.0	
Strontium (Sr)	0.1895	0.288	0.205			0.218	0.2251	0.1946	0.337	0.259	0.282	0.2682	
Sulphur (S)						4.1	4.1				11.2	11.2	
Thallium (Tl)			0.0001			0.003	0.003			0.0001	0.003	0.003	
Thorium (Th)						0.005	0.005				0.005	0.005	
Tin (Sn)						0.005	0.05				0.005	0.005	
Titanium (Ti)		0.01				0.001	0.01		0.01		0.001	0.010	
Uranium	0.0003	0.001				0.06	0.0006	0.0003	0.0012		0.06	0.0007	
Vanadium (V)	0.015	0.03	0.001			0.002	0.0153	0.015	0.03	0.001	0.002	0.0153	
Zinc (Zn)	0.0025	0.005	0.005			0.002	0.0036	0.0025	0.005	0.005	0.001	0.0042	
Zirconium (Zr)						0.001	0.001				0.001	0.001	
Cyanide (mg/l)													
Total Cyanide	0.0127	0.006	0.004				0.00757	0.0196	0.005	0.004		0.00953	0.005

*Source of information: **DIAND**=Water Resources, **Minto IEE**=Minto Explorations (IEE Volume II, 1994), **ACG**=Access Consulting Group, **Minto Annual Report**=1998/1999 Annual Report to the Yukon Territory
Note: **Bold** and shaded values represent those samples exceeding CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CCME, 1999). CCME guidelines are for total metals and some Water analysis parameters only.

Minto Project Site Inspection and Compilation of Environmental Information

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DIAND Renewable Resources
Waste Management Program

Legend

- Existing Trails
- Watercourse
- Surface Water Quality Monitoring Station
- Ground Water Quality Monitoring Station
- B.C. Research Water Quality Monitoring Station (1976)
- Environment Canada Water Quality Monitoring Station (1975-76)

Environmental Monitoring Stations

1km 2km

Scale approx 1:55 000

ACCESS CONSULTING GROUP

DRAWN BY: LDR	CHECKED BY: DDC
DATE: 03/02/2000	

Figure 5

Yukon River

Unnamed Creek B

Minto Creek

Big Creek

EC-4

EC-6

EC-3

EC-7

EC-2

93 E

94-20

Airstrip

Meteorological Station

BCR-1 BCR-2 BCR-3 BCR-4 BCR-5 BCR-6 BCR-7 BCR-8 BCR-9 BCR-10 BCR-11 BCR-12

W1 W2 W3 W4 W5 W6 W7 W8 W9

Minto Creek (Reach 2)
- Steep Gradient (21%)
- Presumed Barrier to Fish Migration
- Approximately 2km Upstream of Confluence with Yukon River

W2
- Lower Minto Creek
- Stream Sediment & Water Samples collected (13/10/99)

W3
- Upper Minto Creek
- Below Tailings Impoundment Dam
- Water Samples collected (13/10/99)

Environmental Monitoring Station W2 – Disturbed Housing for Hydrometric Datalogger

4.3.2 Groundwater Hydrology and Water Quality

Little information exists in regards to groundwater hydrology in the Minto Creek Drainage. However, attempts to quantify groundwater quality led to the installation of a pair of two (2) inch groundwater wells. They are located within the mineral deposit area and are designated 93-E (83.4m depth) and 94-20 (36.4m depth). Comparison of water quality parameters indicate that the ground water in the area is similar in quality to the near-deposit surface watercourses, except for elevated turbidity, alkalinity, fluoride, and sulphate concentrations. Monitoring data collected at these wells is also included in Appendix B. The location of the ground water monitoring wells is shown in Figure 5.

4.4 AQUATIC RESOURCES

4.4.1 Fishery Resources

Fish species found in the Yukon River include chinook, coho, and chum salmon, rainbow trout, lake trout, least cisco, round whitefish, inconnu, Arctic grayling, northern pike, burbot, longnose sucker, and slimy sculpin. Of these species only slimy sculpins and Arctic grayling were found in Minto Creek during the 1994 fishery survey. Minto Creek has been classified as a Type II habitat by the Yukon Fisheries Protection Authorization. This habitat designation is applicable to

the lower 1.5 km portion of the watercourse as steep gradients prevent fish from further migration upstream (Volume II Minto Project IEE). Since Minto Creek is an ephemeral watercourse, freezing completely during the winter, it is unlikely that any over wintering habitat for fish exists along the creek. No fish were found in reaches above the 1.5 km mark of the creek that provides the barrier to fish migration. The location of the barrier to fish migration on Minto Creek is shown on Figure 5.

Numerous locations along the Yukon River, including the confluence of Big Creek provide spawning and rearing habitat for the aforementioned fish species, including important commercial and subsistence species such as chinook and chum (dog) salmon. These areas have been identified as a result of consultation with SFN members, government fish habitat data, and other personal communications. Figure 6 provides more information on the uses and the location of Yukon River fish and fish habitat in the Minto Project area.

4.4.2 Benthic Macroinvertebrates

Benthic macroinvertebrate samples were collected along Minto Creek on several occasions during June 1975 and September 1976 by the Department of Fisheries and Oceans and Environment Canada, and by Environmental Protection Service in 1977. The most recent sampling occurred in August 1994, by Hallam Knight Piesold. The following discussion and presentation of results has been adapted from Minto Explorations Ltd. IEE, Volume II, Environmental Setting.

Benthic invertebrate communities that develop in a particular habitat reflect the relative success of those species that have adapted to suit that particular environment. Community structures of these species change as the habitat in which they reside changes, be it as a result of seasonal hydrology or water quality fluctuations or environmental disturbances. Routine sampling can track these temporal and spatial trends in species composition and abundance. The relative sensitivity of the various invertebrate inhabitants to ambient water chemistry and the changes discussed above can also be used as indicators of water quality (Minto Explorations Ltd. IEE, Vol. II).

Sampling occurred along Minto Creek at benthic sampling stations, designated B1 to B6, which correspond to water quality monitoring stations W1, W2, W3, W7, W8 and W9, respectively (see

Figure 5). Samples were preserved, stained, and sent to Dr. Charles Low in Victoria, BC for taxonomic analysis and enumeration.

Table 6 presents the numerical, statistical, and qualitative analysis results conducted as a part of the benthic invertebrate studies.

Once taxonomic identification of the samples was determined, species abundance and number of taxa were determined for each sample. Statistical analyses such as richness, diversity, dominance, and equitability indices were generated for the data set. In addition, relative abundance values and tolerance categories were determined.

Groups/species of benthic invertebrates exhibit various tolerances to disturbance, natural or otherwise. Species with a low tolerance range are susceptible to disturbance and therefore represent the best and most immediate indicators of environmental change. Organisms in the facultative and tolerant categories are more able to exploit habitat in which seasonal fluctuations or disturbances occur. With the exception of Station B4, benthic communities in Minto Creek contain a large portion of facultative species, followed by lower percentages of sensitive and tolerant species, respectively.

In general, all sites contained a well-rounded representation of sensitive, facultative, and tolerant species (Minto Explorations Ltd. IEE, Vol. II). Dipteran taxa (flies) were well represented in the facultative category; however, the facultative species composition consisted primarily of other insects and invertebrates. Populations of copepods enumerated in Minto Creek indicate a relatively large quantity of pool habitat (high numbers, specifically standing water).

It should be noted that as portions of the Minto Creek watershed recover from previous forest fires, changes in riparian and in-stream ecosystems might occur. Subsequently, benthos populations and species distributions within the watershed may also change.

Table 6 Minto Creek Benthic Community Characteristics

	B1	B2	B3	B4	B5	B6
Density (#/m^2)						
Sensitive	1381	3489	1302	14453	2342	345
Facultative	3496	5802	1173	4673	10395	13608
Tolerant	421	36	162	1014	1277	950
Total	5298	9327	2637	20140	14014	14903
% Composition						
Sensitive	26.07	37.41	49.39	71.76	16.71	2.32
Facultative	65.99	62.21	44.47	23.2	74.18	91.31
Tolerant	7.94	0.39	6.14	5.04	9.11	6.37
# of Species	44	43	38	34	33	31
Shannon-Weiner Diversity	3.88	3.69	3.76	2.59	3.56	2.82
Dominance	0.11	0.11	0.13	0.38	0.13	0.27
Equitability	0.71	0.68	0.72	0.51	0.71	0.57
Richness	5.89	5.34	5.61	3.82	3.87	3.6
TU Diversity	0.892	0.894	0.873	0.623	0.871	0.732
Variance	0.027	0.015	0.049	0.319	0.03	0.165

Adapted from Table 7.3 Minto Explorations Ltd. IEE, Vol. II Environmental Setting

4.4.3 Periphyton

Periphytic alga are simple aquatic organisms which inhabit the substrate and water column of various water bodies. These organisms manufacture energy via photosynthesis and represent the base of the food chain within any aquatic community. As with benthic invertebrates, community species distributions and populations of periphyton can vary both temporally and spatially and as a result of seasonal hydrology or water quality fluctuations or environmental disturbances.

Information pertaining to species distribution and community structure of periphytic organisms in Minto Creek was gathered during the same period as the benthic invertebrate studies conducted in 1994. Five sites were established for periphyton sampling designated P1-P5, corresponding to water quality sampling sites W1, W2, W3, W5 and W9 on Minto Creek.

Concentrations of chlorophyll ‘a’ were determined to estimate algal biomass and therefore primary productivity in sections of the Minto Creek watershed. The highest mean concentrations of chlorophyll ‘a’ were detected in the upper reaches of Minto Creek where there is little vegetative cover and an abundance of sunlight exposure to the creek. The lowest concentrations of chlorophyll ‘a’ were detected at P3 (W3). Table 7 summarizes the results of the periphyton sampling, displaying chlorophyll concentrations calculated from the various sampling sites.

Table 7 Minto Creek Periphyton Chlorophyll 'a' Content
(micrograms/cm^2)

Replicate	Site P1	Site P2	Site P3	Site P4	Site P5
1	0.187	0.059	0.094	0.352	0.375
2	0.208	0.112	0.141	<0.01	0.181
3	0.132	0.637	0.098	0.153	1.104
4	0.059	0.077	0.073	0.092	0.0189
5	0.941	0.473	0.022	0.081	0.167
6	0.061	0.312	0.047	0.077	0.334
Mean	**0.265**	**0.278**	**0.079**	**0.126**	**0.392**
Standard Deviation	**0.045**	**0.053**	**0.206**	**0.109**	**0.142**

Note: Adapted from Minto Explorations Ltd. IEE, Vol. II, Environmental Setting, Table 8.1

Taxonomic identification and relative abundance rankings of the various alga samples has provided information on community composition and complexity. In general, samples from most of the sites on Minto Creek contained very little periphyton, indicating a relatively unproductive environment. This may be due to nutrient availability limitations and/or habitat disturbances as the result of seasonal scouring from high flow events, for example (i.e. substantial freshet). Species composition here is similar to other Southwest Yukon streams (Minto Explorations IEE, Vol. II). *Nitzschia* spp. were the most prevalent species, especially at sites P2 and P3 (downstream of the orebody).

4.4.4 Stream Sediments

Stream sediments were sampled at the lower reach of Minto Creek (Station W2) on October 13, 1999. The sediments were sampled in triplicate and shipped for analysis to Norwest Labs of Vancouver the following day. ICP semi-trace metal analysis in solids and a wet sieve analysis were conducted on the samples. Another sampling of Minto Creek sediments was conducted in 1994 during the collection of baseline information for the Minto Project IEE.

Sediments in Minto Creek consist primarily of sand with some gravels and minimal fractions silts and clays (Volume II Minto Project IEE, 1994). Results from the 1994 sediment analysis showed high levels of arsenic in the lowest reach of Minto Creek, high levels of chromium and zinc one (1) kilometer downstream of the proposed tailings dam, and high levels of copper in the vicinity of the ore body in the upper reaches of the creek. Results of the 1999 analysis, restricted to the lower reach of Minto Creek, showed similarly high concentrations of arsenic and chromium. However, only one replicate for each of chromium and arsenic exceeded CCME Sediment Quality Guidelines for the Protection of Aquatic Life, in 1999 (CCME, 1999). No stream sediments were collected elsewhere on site.

The results of this analysis and that of October 1999 are presented in Table 8.

Table 8 Results of Stream Sediment Analysis at Lower Minto Creek - Station W2

	Location						
	W2 Replicate #1	W2 Replicate #2	W2 Replicate #3	W2 Replicate #1	W2 Replicate #2	W2 Replicate #3	CCME Guidelines
Source	ACG	ACG	ACG	Minto IEE	Minto IEE	Minto IEE	
	13-Oct-99	13-Oct-99	13-Oct-99	1994	1994	1994	
Physical Tests							
Moisture %				21.00	18.10	16.30	
Particle Size							
Gravel - % (>2.00 mm)				25.00	27.50	34.00	
Sand - % (2.00 - 0.063 mm)				64.00	64.00	58.50	
Silt - % (0.063 mm - 4 um)				7.59	6.56	5.74	
Clay - % (<4 um)				1.99	1.93	1.75	
Wet Sieve for Solids (% Retained)							
10 Mesh (2mm)	86.2	57.4	62.8				
18 Mesh (1mm)	4.3	12.5	6.3				
35 Mesh (0.5mm)	3.7	14.3	8.4				
60 Mesh (0.25mm)	2.8	9.6	9.6				
140 Mesh (0.1mm)	1.5	4.4	7.2				
270 Mesh (0.053mm)	0.8	1.1	3				
Total Metals (mg/L)							
Mercury (Hg)				0.01	0.01	0.02	
Metals in Solids (micrograms/gram)							
Aluminum (Al)	13100	12600	11400				
Antimony (Sb)	<2	<2	<2	0.32	0.29	0.25	
Arsenic (As)	2	**6**	<2	4.57	4.66	4.09	5.9
Barium (Ba)	184	196	169				
Beryllium (Be)	0.3	0.3	0.3				
Bismuth (Bi)	<5	<5	<5				
Cadmium (Cd)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6
Calcium (Ca)	9590	6610	7530				
Chromium (Cr)	**37.6**	25	26.3	13.40	15.00	13.70	37.3
Cobalt (Co)	6.7	5.7	6.2				
Copper (Cu)	10.9	10.3	13	14.20	14.20	13.00	35.7
Iron (Fe)	15000	13000	14000				
Lead (Pb)	4	5	3	2.60	2.20	<2	35
Lithium (Li)	5	3.8	5.1				
Magnesium (Mg)	5290	3840	5290				
Manganese (Mn)	439	470	367				
Molybdenum (Mo)	<1	<1	<1	<4.0	<4.0	<4.0	
Nickel (Ni)	13.5	10	14.7				
Phosphorus	841	445	835				
Potassium (K)	2920	2960	2340				
Selenium (Se)	<2	<2	<2				
Silicon (Si)	447	817	114				
Silver (Ag)	<0.5	<0.5	<0.5	<2.0	<2.0	<2.0	
Sodium (Na)	1940	3130	1650				
Strontium (Sr)	78	79	59				
Sulphur (S)	100	60	140				
Thorium	<1	2	<1				
Tin (Sn)	2	2	2				
Titanium (Ti)	989	518	683				
Uranium	<5	<5	<5				
Vanadium (V)	44	30	36				
Zinc (Zn)	30.9	22.8	30.7	30.40	28.90	29.00	123
Zirconium (Zr)	9.6	6.4	8.3				

Note: **Bold** and shaded values represent those samples exceeding CCME Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life (CCME, 1999). CCME guidelines are for total metals.

4.5 ARCHAEOLOGY AND TRADITIONAL LAND USE

4.5.1 General Project Area

Areas of archeological interest near Minto are represented by four sites identified during an archeological survey conducted by Sheila Greer, in 1994 (Minto Project IEE, Vol. II, 1994). Three of the sites exist on the east side of the Yukon River, outside of the mine development area, while the other is located near the mouth of Minto Creek. No sites were identified or suspected of existing along the Project access road or within the mine site area. The reader is referred to the Minto Project IEE Volume II by Hallam Knight Piesold for a more detailed discussion archeology and historical anthropology of the Minto area (1994).

Interviews of SFN members were conducted as part of the compilation of environmental information for the Project area. The Project area lies within the traditional territory of the SFN and comprises part of land claim settlement parcels R-6A (Type A settlement lands), R-44A and R-40B, specifically the upper reaches of Minto Creek.

4.5.2 Selkirk First Nation Interview Results

The SFN continues to use the Project area for various activities including fishing, hunting, berry picking, and spiritual fulfillment. As a result, their current and historical knowledge of the area the SFN represents a valuable source of baseline information.

Interviews were conducted with elders and knowledgeable band members in the community of Pelly Crossing to gather local and traditional knowledge about the Project area. The interview process was initiated by introduction of the study goals to the prospective candidate. Each person interviewed was provided a description of the Project area and given some background regarding the Minto Project itself. Upon acceptance to participate, the person would be asked a series of questions presented in a questionnaire format. A site map of the area facilitated discussion and response to interview questions.

Twelve SFN members from Pelly Crossing were interviewed, including nine elders, by Nancy Alfred, a SFN member. Table 9 provides the list of interview participants. Interview questions consisted of natural resource based questions such as knowledge of and participation in various resource extraction activities (hunting, fishing, trapping, plant and berry gathering, etc.). Other questions solicited information regarding the knowledge of temporal and spatial trends observed regarding animal, plant and fish abundances and locations. There were no significantly negative responses to the posed questions, however a general sense of concern regarding the Minto Project was expressed. The respondents use the area for subsistence and other cultural activities and are keen on seeing it remain a site of continued cultural land use.

Respondents indicated on a map of the Project area where they know of, or they have, conducted various cultural land use activities. The results of this questionnaire are summarized in Figure 6.

A copy of the original questionnaire and the associated results are included as Appendix C.

Table 9 List of Interview Participants

Kitty Johnathan	Elder
Tommy Joe	Elder
George McGinty	SFN Member
Maria VanBibber	Elder
Alex Joe	Elder
Franklin Roberts	Elder
Danny Roberts	Elder
Daniel Luke	SFN Member
Darryl Johnny	SFN Member
Annie McGinty	Elder
Mary Blanchard	Elder
Johnny Simon	SFN Member

Minto Project Site
Inspection and Compilation of Environmental Information

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DIAND Renewable Resources
Waste Management Program

General Project Area (along Yukon River)

- Good fishing from Minto landing to Fort Selkirk (primarily Arctic Grayling, Chum & Chinook Salmon, Inconnu, and Whitefish)
- Creek mouths at Yukon River good fishing areas
- Have observed cyclical rabbit populations relationship to abundance of other predatory species, affects trapping success
- Numerous species of waterfowl which are hunted along the Yukon River
- Eagles are abundant along the Yukon River
- Existence of sacred traditional area (location undisclosed)

Yukon River

Chum & Chinook Salmon, Pike, and Whitefish spawning, good fishing area

Slough/Wetland Areas appear to be drying up

Project Area (Yukon River-East)

- First Nations use of area for fishing, hunting, berry and medicinal plant gathering, and trapping (current & historic)
- Trapped species include beaver, muskrat, lynx, fisher, otter, rabbit, marten, mink, fox, wolverine, squirrels
- Forest Fire has reduced numbers of animals in the area, but returning

Minto Creek

Proposed Minto Mine Site

Chum & Chinook Salmon, and Arctic Grayling spawning

CA-14-1995

CA-16-1980

CA-15-1995

Big Creek

Minto Landing

Salmon & Grayling Fishing

Project Area (Yukon River-West)

- First Nations use of the area for fishing, hunting, and trapping (current & historic)
- Trapped species include beaver, muskrat, lynx, fisher, otter, rabbit, marten, mink, fox, wolverine, squirrels
- Forest Fire has reduced numbers of animals in the area, but returning

Dark Creek

CA-21-1994

Legend

- Klondike Highway (#2)
- Existing Trails
- Watercourse
- Forest Fire General Area

Traditional Knowledge - Historic Forest Fires

1.5km 3km

Scale approx 1:90 000

ACCESS CONSULTING GROUP

DRAWN BY: LDR	CHECKED BY: DDC
DATE: 24/01/2000	

Figure 6

4.6 CURRENT LAND USE & CULTURAL RESOURCES

4.6.1 Land Tenure

Land tenure in the general vicinity of the Minto Project is limited to areas east of the Yukon River. Much of the Minto Landing area is held under title by the SFN. Other settlement lands and site specific land selections by the SFN are also located in the region. Several fee simple titled properties also exist in the area that are held by non-first nation persons. Figure 7 displays land tenure in the Project area. Detailed land tenure information for the Minto Landing area is provided in Figure 8.

The SFN has several tracts of settlement land adjacent to or within the Project area (Figure 7). The importance of the area for traditional and historic use is reflected in the lands chosen by the SFN. SFN concerns were addressed in September of 1997, upon the signing of a co-operation agreement with MEL. The SFN remains a strong supporter of the Project.

4.6.2 Mining

Mining in the immediate Project area is limited to the proposed Minto Project (currently in development). However, south of the Project area there is placer mining in the Big Creek watershed, and the proposed Carmacks Copper Project open pit copper mine in the Williams Creek watershed.

Mineral claims and leases were acquired by MEL from ASARCO Inc., Teck Corporation, and Falconbridge. Claim boundaries and lease numbers are shown in Figure 2.

4.6.3 Forestry

There are currently no permitted forestry activities in the Project area. Regional forest uses are limited to commercial permits to log burn-areas near Minto and harvest of fuel-wood for domestic use (DIAND-Field Operations, 2000).

MEL conducted a survey of harvest potential for fire killed fuel wood. The results of this survey indicated that there was sufficient fire killed fuel wood within the quartz claim boundaries to supply fuel wood for 100 years. This estimate was based on a volume of 725 m^3 of timber necessary to fire a one to two (1-2) million BTU per hour boiler/furnace at the mine site. The survey also suggested that a 30-year timber supply having 'good potential' exists in the area.

Minto Project Site Inspection and Compilation of Environmental Information

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DIAND Renewable Resources
Waste Management Program

Legend

- Klondike Highway (#2)
- Existing Trails
- Watercourse
- Selkirk First Nations Settlement Lands

Yukon River

R-41B

SIBBEL KACHUR LOT 1013
QUAD 115I/11

R-10B

R-11B

R-03A

R-44A

MINTO TENURE DETAIL - SEE FIGURE 8

R-43B

R-44B

R-06A

DEF Claims

Lease Plan 59454 CLSR

Lease Plan 59454 CLSR

Lease Plan 59454 CLSR

Lease Plan 59648 CLSR

Minto Creek

Minto Claims

Airstrip

Big Creek

Dark Creek

G&K KRUSE
LOT 1003
QUAD 115 I/10

G&K KRUSE
LOT 1002
QUAD 115 I/10

Minto Project Area Land Tenure

1.5km 3km

Scale approx 1:80 000

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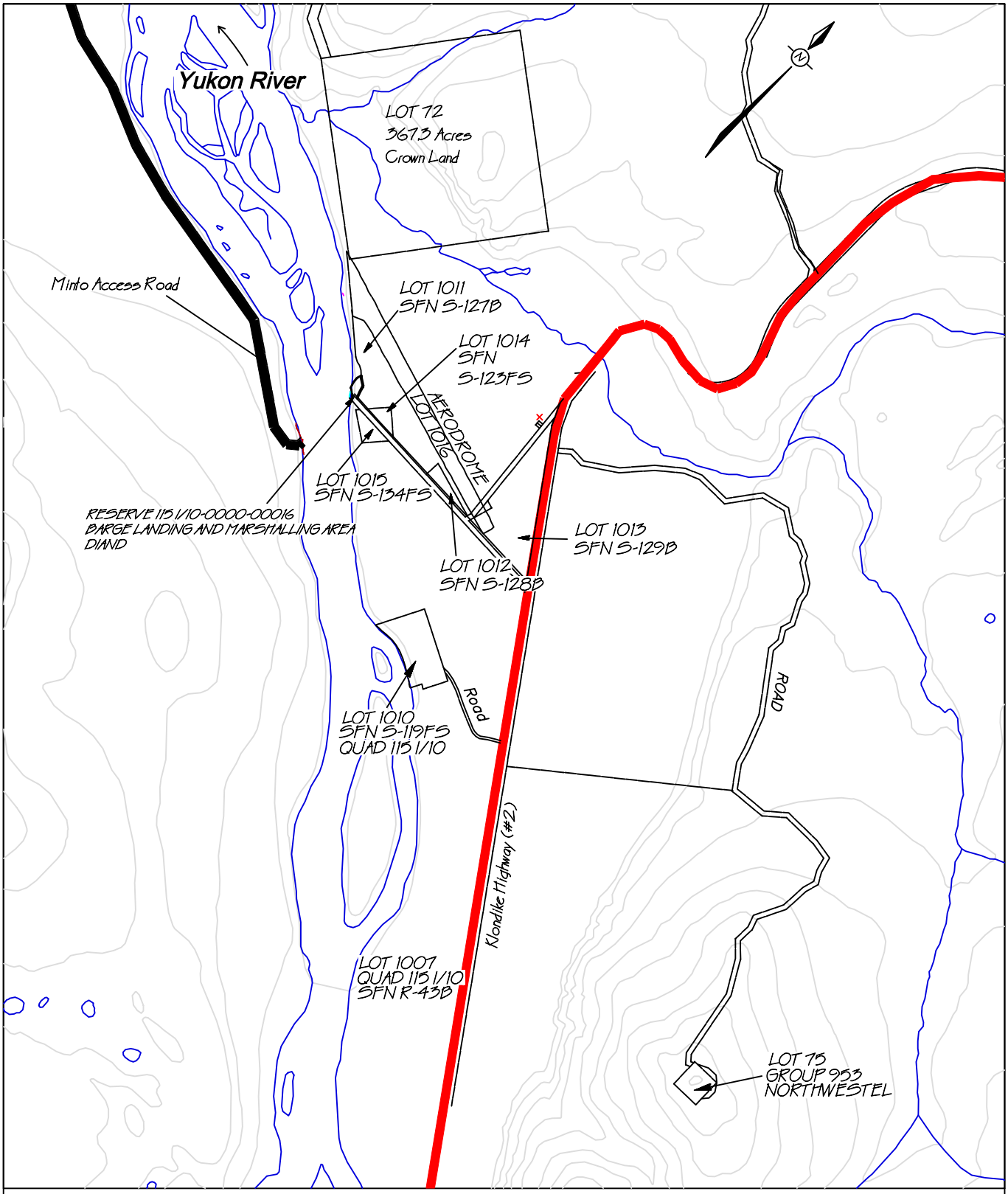
DRAWN BY: LDR | CHECKED BY: DDC

DATE: 03/02/2000

Figure 7



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Minto Project Site Inspection and Compilation of Environmental Information

Minto Landing - Land Tenure Detail

DRAWN BY: LDR	CHECKED BY: DDC	**Figure 8**
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4.6.4 Trapping and Outfitting

Trapping remains an important economic and subsistence activity for many SFN members and Yukoners in the Project area. Several Registered Trapping Concessions are held in the Project area. These include: RTC #136: Heinz Sauer, RTC#139: Danny Joe, RTC #142: OPEN, RTC #143: Johnny Sam, RTC #145: Glen and Jim Bullied, RTC #146: Geo and Ken M^{c}Ginty, RTC #147: Kathleen Sam.

Trapper access to the Project area has been identified and will be maintained, according to compensation agreements negotiated with the Project proponent.

Only two outfitting concession falls within the Project area, Registered Outfitting Concessions #13 – Held by Tim Mervyn (Mervyn Outfitting) and #14 – Held by Curt Thompson (Trophystone Safaris).

Trapping and outfitting concessions, as well as game zone locations and historical records of big game harvests in the area are presented in Figure 9.

4.6.5 Recreation and Other Land Uses

The Yukon River, in the vicinity of Minto Landing and the Minto Project access route, currently hosts recreational activities such as fishing, hunting, hiking and canoeing/rafting. The nearby Minto Resorts, owned and operated by the SFN, provides camping and other outdoor adventure excursions for visitors to the area. Minto Landing is also a starting point for tourist excursions down-river to historic Fort Selkirk. The Yukon River is also used as a transportation corridor for freight and other cargo. Land use on the western shores of the Yukon River is limited, as vehicle access to the western shore is available only in winter over river ice, or during open water by barge.

4.6.6 Cultural Land Use Activities

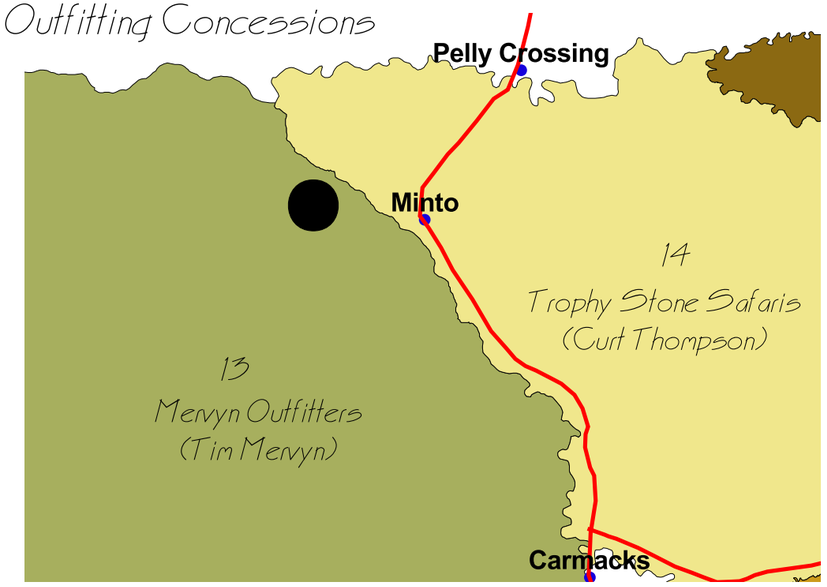
Annual salmon fishing occurs at Minto Landing and other sites along the Yukon River. Members of the SFN were seen catching chum salmon at Minto Landing during the site inspection. The Minto landing area is used for various cultural activities throughout the year, including berry

picking, trapping, hunting, and spiritual activities. Figure 6 displays the location of some of the current cultural land use activities in the area.

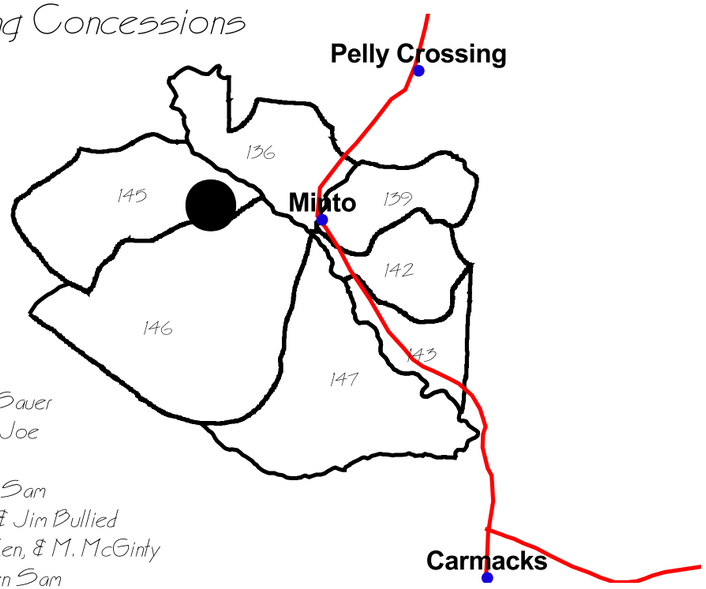
As part of the Minto mine development Project, a comprehensive cooperation agreement was signed with the SFN and MEL on September 16, 1997 (Minto Exploration Ltd., 1997).

Please refer to Section 4.5 for a more detailed discussion of cultural land use activities in the Project area.

Outfitting Concessions

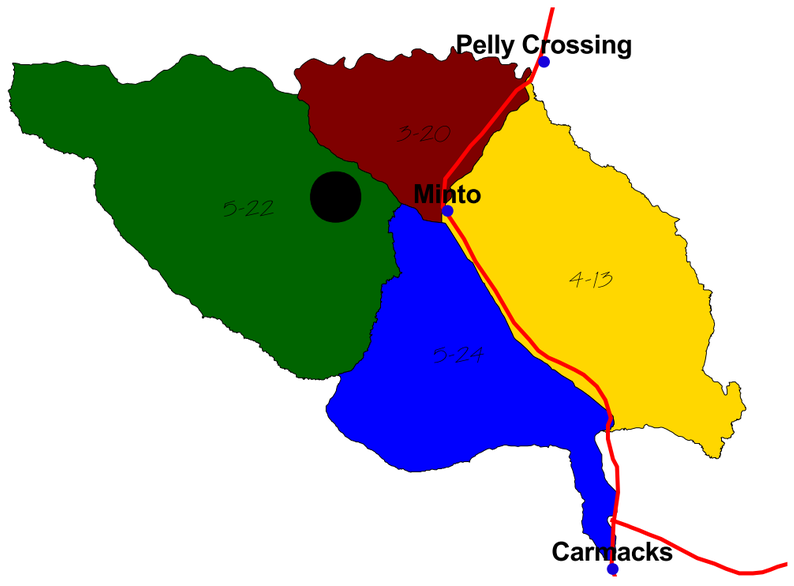


Trapping Concessions



136 Heinz Sauer
139 Danny Joe
142 open
143 Johny Sam
145 Glenn & Jim Bullied
146 Geo, Ken, & M. McGinty
147 Kathleen Sam

Game Management Zones



Big Game Harvest Levels (1980 to 1998)

Game Zone 3-20	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	0	2	0	3	1	1	1	2	2	2	3	2	1	1	0	1	1	1	1
Grizzly	0	0	1	0	0	0	1	2	0	2	0	1	0	0	2	1	3	2	0
Caribou	0	0	0	0	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Moose	1	3	3	3	4	2	0	6	3	3	1	0	1	2	1	4	2	1	5

Game Zone 4-13	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	0	2	0	1	2	2	1	1	2	2	1	0	1	0	1	0	1	1	0
Grizzly	3	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Caribou	0	0	0	0	5	0	1	0	0	1	0	0	1	1	0	0	0	0	0
Moose	1	2	1	2	4	0	1	0	0	1	5	1	2	2	1	3	1	3	1

Game Zone 5-22	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	1	3	0	0	1	0	4	2	3	0	0	1	0	0	0	0	1	0	0
Grizzly	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Caribou	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	1	1	5	6	2	1	1	3	1	0	0	0	1	1	0	0	0	0	0

Game Zone 5-24	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black Bear	1	1	0	1	1	1	0	2	0	0	0	0	2	0	0	0	2	0	0
Grizzly	0	0	0	0	2	0	0	1	0	0	1	0	1	0	0	0	0	1	0
Caribou	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Moose	2	2	8	5	0	2	2	6	1	0	0	0	0	1	1	0	0	0	1

Minto Project Site
Inspection and Compilation
of Environmental Information

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Legend

Minto Project Location

Highway

Game Management,
Trapping, and Outfitting Concessions

10 0 10 20 30 40Km

Scale approx 1: 1 000 000

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Figure 9