MINTO PROJECT

DECOMMISSIONING & RECLAMATION PLAN

2001/April/27

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MINTO PROJECT
YUKON

DECOMMISSIONING & RECLAMATION PLAN

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1 INTRODUCTION

1.1 General

The **Decommissioning & Reclamation Plan** is being submitted under #78 of Water Use Licence QZ96-006.

1.2 Scope

A provisional Closure & Reclamation Plan was included with the Type A Water Use Licence Application filed for the Minto Project in 1997. This Plan was reviewed by independent consulting engineers for Indian and Northern Affairs Canada and at two Water Board hearings held in May and July 1997.[1]

Construction has not been completed as set out in sub-section **1.4.3 Project Completion**. This **Decommissioning & Reclamation Plan** therefore remains conceptual in nature and must be amended from time to time to allow for changes in the operation that are expected to occur during the life of the mine especially in light of the exploration potential on the property. Water Use Licence QZ006-96 is set to expire on June 30, 2006 and this will provide an opportunity to review and revise the **Decommissioning & Reclamation Plan** and the security required.

Extensive technical information has previously submitted for the Minto Project and this information has not been included in this study. A short bibliography has been attached as section **11 BIBLIOGRAPHY**.

1.3 Environment, Safety and Health Management System

Minto Explorations Ltd. has adopted an **Environmental, Safety And Health Policy** and has developed an **Environment, Safety and Health Management System** for the Minto Project that is being used to implement the **Policy**. This framework document includes a number of plans or supporting documents that have been prepared and are being used in the day-to-day management of the Minto Project as listed in sub-section **11 Bibliography – I Environment, Safety and Health Management System.**

The **Decommissioning & Reclamation Plan** is a key component of the **Environment, Safety And Health Management System.**

Effective implementation is the key to any operation that will protect the natural surroundings, provide a safe and healthy work environment and permit the responsible and cost-effective extraction of natural resources and this has certainly been the focus of efforts made by the management of Minto Explorations Ltd. on the Minto Project.

Note the conclusions drawn in "Lessons to be Learned" by Jerrold J. Marcus, Consulting Editor, E&MJ, February 1997 on the closing of the Island Copper Mine in BC, reproduced in sub-section **13 ATTACHMENTS – Attachment 1**.

Management of Minto Explorations Ltd. is in ongoing discussions with ASARCO Inc. and it is expected that construction will proceed in 2001 with the start of production now expected in late 2002.

1.5 Approvals And Permits

1.5.1 General

Minto Explorations Ltd. has secured various approvals and permits for the Minto Project. The approvals and permits are issued under the jurisdiction of the Federal, Territorial and Municipal governments. A list of the approvals and permits required for the Minto Project is shown in sub-section **12 APPENDICES - Appendix 2**. This list of approvals and permits is being updated regularly to ensure all approvals and permits are current and valid.

Note that additional approvals and permits will be required as the Minto Project proceeds and the approvals and permits that have been identified have also been included in sub-section **12 APPENDICES - Appendix 2**.

1.5.2 The Initial Environmental Evaluation (IEE)

The IEE was submitted under the Environmental Assessment & Review Process Guidelines Order to the Yukon Regional Environmental Review Committee (the RERC) on May 17, 1995 to start the Level II review. Letter reports that addressed specific concerns raised by members of the RERC were submitted in September and November 1995, January and June 1996 and January 1997. General agreement on outstanding issues and mitigation measures required was reached in a final meeting with the RERC on January 10, 1997. The Draft Screening Report was issued by the RERC for the 30-day public review early 1997.

1.5.3 The Screening Report

Indian and Northern Affairs Canada released the final Screening Report for the Minto Project on April 8, 1997. This is a key document as it records the commitments made by Minto Explorations Ltd. during the environmental review process. The Screening Report formed the basis for the application for a Type A Water Use Licence, which is required for the Minto Project under the Yukon Waters Act. A regular review of the Screening Report is required to ensure that concerns that were expressed at the screening stage are being monitored.

1.5.4 Type A Water Use Licence QZ006-96

An application for a Type A Water Use Licence was filed with the Yukon Territory Water Board on February 28, 1997. Public hearings were held in Whitehorse on May 14 and July 17, 1997. Water Use Licence QZ006-96 was issued by the Water Board on January 27, 1998, and signed by the Honorable Jane Stewart, Minister of Indian and Northern Affairs Canada, on April 27, 1998. Water Use Licence QZ006-96 has a term of seven years and will expire on June 30, 2006.

This is the key Licence for the Minto Project, and the terms and conditions of the Licence must be strictly adhered to. Note that a number of submissions and studies are required under the Licence.

The following report was submitted to the Yukon Territory Water Board on August 26, 1999:

> "Construction Specifications, Tailings/Water Dam, Minto Project, Yukon", Project No. 0201-99-13899, EBA Engineering Consultants Ltd., Edmonton, Alberta, June 1999.

A construction specification for the diversion ditch is included in the above report.

The following report was prepared by EBA Engineering Consultants Ltd. in 1997:

> "Design Brief Tailings/Water Dam, Minto Project, Yukon", Project No. 0201-95-11509, EBA Engineering Consultants Ltd., Whitehorse, Yukon, August 1997.

EBA has prepared designs for abandonment of the tailings/water dam using the Probable Maximum Flood (PMF) and Maximum Credible Earthquake (MCE) design criteria and of the diversion ditch using the PMF design criteria. The designs described in the above report, have been used to estimate closure costs for these two structures.

1.6 Environmental Monitoring

1.6.1 The Environmental Monitoring Plan

An **Environmental Monitoring Plan** was prepared and is being used as required by Part F - Programs And Studies of Water Use Licence QZ006-96.

The environmental monitoring plan was developed to ensure that monitoring can be done on a systematic basis and that any problems that may arise are quickly identified and addressed.

Detailed records are being kept of all sampling done, the results obtained as well as related reports and these will be reviewed on a regular basis throughout the life of the mine to ensure effective environmental protection.

1.7 The Selkirk First Nation

1.7.1 General

The Selkirk First Nation has had historic use of the lands in the vicinity of the Minto property, and an area surrounding the property was selected by the Selkirk First Nation as Category A Settlement Land under the agreement negotiated with the Government of Canada and the Government of Yukon as shown in **Figure 5**.

1.7.2 The Co-Operation Agreement

A comprehensive cooperation agreement was concluded with the Selkirk First Nation and Minto Explorations Ltd. and signed on September 16, 1997. Minto Explorations Ltd made specific commitments in this agreement in a number of areas that include environmental protection, and ongoing reclamation.

A determined effort will be required by the Minto Project management to ensure that band members participate fully in the Minto Project as envisaged in the co-operation agreement.

2.4 Reclamation To Date

Natural re-vegetation has been effective in largely covering the disturbed areas referred to in sub-section **2.2 Existing Disturbance** in the 25 years since the area was first disturbed.

Reclamation of disturbed areas along the access road and at Big Creek in the vicinity of the Big Creek bridge was completed between May 6 and May 10, 2000 and this reclamation has been successful as set out in sub-section **12 APPENDICDES - Appendix 4 – Access Road Reclamation**. In addition, natural re-vegetation has taken place along most of the access road between the barge landing and the mine.

Overall reclamation is therefore expected to be successful with seeding and natural re-vegetation complementing each other.

3 LAND USE OBJECTIVES

3.1 General

Future land use is expected to be as follows:

- Tourism along the Yukon River
- Incidental recreation along the Yukon River
- Minimal hunting and trapping in the Minto Creek basin
- Exploration for mineral deposits in the region
- Habitat for moose and potentially mule deer, large furbearers such as black bear, grizzly bear and wolf and small mammals such as weasel and marten

It is expected that these land use objectives can be met will little difficulty.

4 RECLAMATION UNITS

4.1 General

Reclamation of an estimated 142.6ha of disturbed area in the immediate vicinity of the mine plus an additional 60.7ha of disturbed area along the access road will be required. The disturbed area has been divided into seven Reclamation Units as follows:

- Mill And Ancillary Facilities
- Open Pit
- Thickened Tailings Deposit
- Overburden And Waste Rock Dumps
- Tailings/Water Dam And Diversion Ditch
- Air Strip, Exploration Roads And Trenches
- Access Road

The expected area of disturbance for each of these Units is shown in **Table 1**. The upper Minto Creek basin as it is expected to appear after reclamation has been completed, is shown in **Figure 8**.

Test plots are typically small and optimum conditions may apply. The information obtained from test plots will therefore be applied in reclamation trials to areas 1 ha or larger in size, e.g. on overburden or waste rock dumps, thickened tailings, along the access road and on exploration roads that are no longer in use. Overburden will be hauled by truck to the selected sites and will be spread with a dozer or grader. Successes and failures will provide valuable information on alternative approaches to closing reclamation.

The true benefits of reclamation research will be realized if the information obtained and knowledge gained are incorporated into larger scale reclamation projects as quickly as possible.

6 RECLAMATION STRATEGY

6.1 Introduction

The mine life is expected to be approximately 11 years. Approximately one year will be required for construction of the mill and ancillary facilities, for mine pre-production development and for construction of the tailings/water dam, the mill water pond and the diversion ditch. Production will start in year 1 and will continue to the end of year 11.

Reclamation of the disturbed areas will be done on the basis of three distinct phases of reclamation to match the overall mining schedule - during construction and the first year of production (Year 1), during operations (Years 2 to Year 11) and after mine closure (Year 12+).

A life-of-mine reclamation and post-closure monitoring schedule is shown in **Table 4** and this schedule can be refined as more detailed planning is done once the mine is in production. Note however that work in the field can only be done effectively and at reasonable cost from March to October. A final schedule for decommissioning and closing reclamation can therefore only be prepared once the decision has been made to close the mine.

The cost of doing reclamation research is discussed in sub-section **6.5 Reclamation Research Cost Estimate**

6.2 Phase I (Year 1)

Phase I will commence during the latter part of construction and continue through into the first year of production. Priorities will be:

- Cuts and fills along the access road to control erosion
- Disturbed areas near watercourses along the access road
- Other disturbed areas suitable for reclamation e.g. old exploration trenches

This work will complement the work that has been completed as set out in sub-section **2.4 Reclamation To Date**.

6.3 Phase II (Year 2 To Year 11)

Phase II of the reclamation program will be initiated once the mine is in full production and continue until the end of the life of the mine. A moving three-year plan will be formulated each

detailed designs for key structures that must be confirmed and submitted to the Yukon Territory Water Board for approval:

a. Confirm the adequacy of the design of the tailing/water dam for abandonment. The spillway must be able to handle the probable maximum flood and the dam must be able to withstand a maximum credible earthquake.

b. Confirm the adequacy of the design for the diversion ditch. Will the diversion ditch remain in its present position or be incorporated in the thickened tailings deposit?

c. Confirm plans for the abandonment of the oxide stockpile based upon the results of ongoing water quality monitoring and analysis.

d. Confirm plans for the final disposal of any water treatment sludges that may have been produced during the life of the mine.

Decommissioning of the mine and mill will be based upon an environmental audit to be performed in year 11 and a final Decommissioning Plan will be prepared based upon this audit.

Management of Minto Explorations Ltd. will request an independent review of the environmental audit under its **Environmental, Safety And Health Policy**.

6.4 Phase III (Year 12+) Decommissioning And Closing Reclamation

Decommissioning and closing reclamation will commence in the second half of year 11, the final year of production. It is expected that decommissioning and closing reclamation will take approximately one year to complete with only re-seeding and fertilizing required in the following years and this is described in detail in section **7 DECOMMISSIONING & CLOSING RECLAMATION**.

6.5 Reclamation Research Cost Estimate

The estimated cost of doing reclamation research for ten years is shown in **Table 5**. It is expected that summer students will do reclamation research and that guidance and supervision will be provided by the Environmental Technician employed by the Minto Project and by an independent consultant as required. The operation will incur additional costs to support the reclamation research effort during the ten years that reclamation research is being done and these costs will be absorbed as an operating cost.

7 DECOMMISSIONING & CLOSING RECLAMATION

7.1 Introduction

Preparations for decommissioning and closing reclamation are described in section **6 RECLAMATION STRATEGY**. The costs have been summarized in section **8 RECLAMATION COST ESTIMATE AND SECURITY**.

7.4 Open Pit

Unused explosives that remain on site will be returned for credit and the explosives magazines and other equipment will be returned to the explosives' supplier once mining has been completed.

The pit will be partially backfilled with overburden and waste rock during Phase 4 of mining. The rim of the pit will be scaled with a ball and chain once the final surface cut has been completed and no further reclamation work will be done on the open pit walls. Final drainage patterns will be established around the perimeter of the pit as each phase of mining is completed. Boulders, up to 1 m in size, will be placed along the perimeter of the pit to provide a barrier between the rim of the pit and the pit perimeter road. Trees will be planted along the pit perimeter road once access is no longer required.

The open pit will be flooded to the 780m elevation at the end of the life of the mine. Water will flow from the open pit at the low spot on the final access ramp as shown in **Figure 9**. The time required to flood the open pit is projected to be approximately 5.5 years based on mean flows. Approximately 55 % (10.6 ha) of the open pit walls will remain exposed above water. Acid-base accounting indicates that the open pit wall rocks are slightly acid consuming or neutral as determined by the baseline test work and this will be confirmed by work to be done during the life of the mine as set out in detail in the **Environmental Monitoring Plan**.

A short section of the pit perimeter at the 780m elevation will be re-contoured to provide for future wetland habitat for waterfowl and other wildlife. Once the water level has reached this elevation, emergent vegetation will be planted in this perimeter zone to provide food and cover to promote wildlife use of this area.

The open pit will act as a very large collection and settling pond for all runoff from the overburden and waste rock dumps.

A cost estimate for closing reclamation around the open pit is shown in **Table 8**.

7.5 Thickened Tailings Deposit

Little re-contouring of the thickened tailings will be required. Experience with similar tailings deposits indicates that the tailings will not require erosion control measures. The tailings will be covered with a layer of overburden approximately 25 cm thick and it is assumed that 100 % of the tailings surface will be accessible for this purpose. Overburden will be hauled from the overburden dump in trucks and spread by dozer. Coarse waste rock from the open pit will be used to protect the tailings edges against erosion as required. Allowance has been made for two ditches, protected with riprap, to cross the tailings surface to channel runoff to the overflow weir and down the spillway of the tailings/water dam.

It is expected that seed mixtures compatible with the willow/sedge (mix #1) and black spruce (mix #2) communities as shown in **Table 2** will be used for seeding.

A cost estimate for closing reclamation on the thickened tailings deposit is shown in **Table 9**.

Plans. Material that has been side-cast will be recovered with an excavator or backhoe. Exploration trenches will be backfilled and natural ground contours will be re-established. It will be important not to disturb areas that have been naturally re-vegetated since the bulk of the exploration was done on the property in the 1970's. The work will be completed during Phase II of the reclamation program as set out sub-section **6.3 Phase II (Year 2 To Year 11)**.

The airstrip will be scarified and seeded once closing reclamation has essentially been completed. It is expected that mix #3, **Table 2**, will be used for seeding. The access road from the mill to the airstrip can then be reclaimed.

The cost estimate for the reclamation of the airstrip, exploration roads and trenches is shown in **Table 12**.

7.8 Access Road

Refer to sub-section **4.2 Reclamation To Date**. Reclamation of disturbed areas along the access road and at Big Creek in the vicinity of the Big Creek bridge to date have been successful. In addition, natural re-vegetation has taken place along most of the access road between the barge landing and the mine. Only remedial work will therefore be required.

Note that only the upper and lower barge landings and a short stretch of the access road can be seen from the Yukon River.

The roadbed will only be partially reclaimed. The former trail along the west side of the Yukon River was used by two trappers for access to their trap lines and this trail will in future follow the access road to the mine. A number of existing trails on the property also form part of the trapper's network of trails. Closing reclamation of the access road and a number of these trails will therefore be done in consultation with the trappers.

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. A trail will remain to permit travel to the mine for ongoing monitoring and for access by trappers during the winter months. Access to the mine during the summer months will be by boat along the Yukon River to the lower barge landing and then via the trail to the mine.
Linear development seed mixes contain a variety of species to accommodate all major environments encountered and, therefore the weight of seed per acre is higher than specific community mixes. These mixes provide a complete range of species for good overall success. It is expected that mix #4, **Table 2**, will be used for roads with mix #5, **Table 2**, used for sands and gravels.

The cost estimate for the reclamation of the access road is shown in **Table 13**.

7.9 Support On Site

Allowance has been made for support on site for a period of nine months to permit the dismantling and removal of the mill and ancillary facilities and for closing reclamation to be completed. Detail is shown in **Table 14**.

Minto Explorations Ltd. is required to provide security of $4,450,000 as set out in Part B - Security of Water Use Licence QZ006-96.

9 TEMPORARY CLOSURE

9.1 General

Minto Explorations Ltd. is required to prepare and submit a plan for temporary closure within six months of the start-up of operations as per #75 of Water Use Licence QZ96-006.

10 REFERENCES

1 "Review Of Reclamation Cost Estimates - Minto Project", Prepared for DIAND, Whitehorse, Yukon, Project # NAP 501 by Robert J. Rodger, P.Eng., March 1996 & Revised April 1997

2 "Minto Explorations Ltd., Minto Project, Initial Environmental Evaluation, Volume I - Development Plan, Volume II - Environmental Setting, Volume III - Socioeconomic Description and Impact Assessment and Volume IV - Environmental Mitigation and Impact Assessment", IEE, Prepared by Minto Explorations Ltd. and Hallam Knight Piesold Ltd., Vancouver, May 1995.

3"Guidelines for Reclamation/Re-vegetation in the Yukon", Kennedy 1993.

11 BIBLIOGRAPHY

A Geology And Ore Reserves

1 Pearson, W.N., "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, April 1977.

2 "The Minto Project, Yukon, Mineral Inventory Review – 1994", H.L. Klingmann and J.S. Proc, Minto Explorations Ltd, Vancouver, B.C., January 1995.

B Mine Design

3 "Minto Project, Geology, Ore Reserves & Mine Design, July 1998", H.L. Klingmann and J.S. Proc.

4 "Geotechnical Evaluation - Proposed Main Waste Dump - Minto Project - Yukon Territory - 0201-95-11509 - April 1998", EBA Engineering Consultants Ltd., Edmonton, Alberta, April 1998.

C Metallurgical Test Work And Mill Design

5 "Development of the Minto Project Process Design", Project No. 8553-15, Kilborn Engineering Pacific Ltd., November 1994.

6 "Metallurgical Test Work And Mill Design Criteria", Minto Project, Yukon, H.L. Klingmann, 1995.

7 "Minto Explorations Ltd., Minto Project, 6102-01, Design Progress At June 1998", Rescan Engineering Ltd., Vancouver, B.C., June 1998.

D Services

7 "Minto Explorations Ltd., Access Road Design Report", Yukon Engineering Services, Whitehorse, Yukon, May 3, 1995.

G Environmental Assessment

19 "Initial Environmental Study Of The Minto Project", Division of Applied Biology, B.C. Research, 1976.

20 "An Assessment of the Pre-Development Water Quality and Biological Conditions in the Water Shed Around the Minto Ore Body", Environment Canada, Environmental Protection Service, 1977.

21 "Design flood estimating guidelines for the Yukon Territory", Janowicz, J.R., Water Resources Division, Northern Affairs Program, Indian and Northern Affairs Canada., 1989.

22 "Guidelines for Reclamation/Re-vegetation in the Yukon", Kennedy 1993.

23 "Minto Area Archaeology And History - Final Report of the Minto Archaeological Impact Assessment Project", Sheila Greer, Edmonton, November 1994.

24 "Minto Explorations Ltd., Minto Project, Initial Environmental Evaluation, Volume I - Development Plan, Volume II - Environmental Setting, Volume III - Socioeconomic Description and Impact Assessment and Volume IV - Environmental Mitigation and Impact Assessment", IEE, Prepared by Minto Explorations Ltd. and Hallam Knight Piesold Ltd., Vancouver, May 1995.

25 "Type A Water Licence Application", Minto Explorations Ltd., Minto Project, May 1995.

26 "Minto Project - Renewable Resources Issue Summary", Letter dated December 14, 1995 from Kelvin Leary, Manager, Environmental Assessment, Yukon Renewable Resources Kevin McDonnell, Project Manager, Environment Directorate, DIAND.

27 "Final Report: Archaeological Impact Assessment Of Two Proposed Barge Landings And Borrow Pits. Minto Landing, Central Yukon", Report prepared for: Minto Explorations Ltd., Vancouver and Yukon Heritage Branch, Whitehorse, Report prepared by: T.J. Hammer, Hammerstone Archaeological Consulting, Whitehorse, October 1996..

28 "Minto Project - Cumulative Effects Assessment", Access Mining Consultants Ltd., Whitehorse, July 1999

H Financial Studies

27 "The Minto Project, Yukon, Feasibility Study – May 1995", H.L. Klingmann & J.S. Proc, Vancouver, BC, May 1995

28 Minto Explorations Ltd., Annual Report – 2000

I Environment, Safety & Health Management System

Environment, Safety And Health Management System and Supporting Documents

Environmental Monitoring Plan

12 APPENDICES

Appendix 1 Construction Progress Report
Appendix 2 List Of Approvals And Permits
Appendix 3 Selkirk First Nation – Environmental Training
Appendix 4 Access Road Reclamation

Appendix 1

Construction Progress Report

Only limited funds were approved by ASARCO Inc. for construction between 1998 and 2000 as the Minto Project was on hold due to low copper prices.

1996 Construction

The initial 16km 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 12.8km of access road were constructed with only final grading and minor cleanup 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 72m, 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 1,688m^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 28.8km 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.

Appendix 2

Approvals And Permits

ISSUED BY THE YUKON TERRITORY WATER BOARD

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Ph
TYPE B WATER USE LICENCE	August 14, 1996	MS98-095	June 30, 2006	Current	Yukon Territory Water Board	Judy Doering, Manager	(867) 6
TYPE A WATER USE LICENCE	April 27, 1998	QZ96-006	June 30, 2006	Current	Yukon Territory Water Board	Judy Doering, Manager	(867) 6

ISSUED BY THE FEDERAL GOVERNMENT - DIAND

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Ph
LAND USE PERMIT	June 4, 1996	YA5F938	July 4, 1998	Expired	Land Resources/Land Use Section	Marg White, Head, Land Use	(867) 6
LAND USE PERMIT	August 27, 1999	YA5F045	July 26, 1999	Expired	Land Resources/Land Use Section	Marg White, Head, Land Use	(867) 6
APPLICATION FOR QUARRYING PERMIT	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Land Resources/Land Use Section	Christie Tavernor	(867) 6
QUARRYING PERMIT	September 1, 1996	96/641	August 31, 1997	Expired	Land Resources/Land Use Section	Marg White, Head, Land Use	(867) 6
BURNING PERMIT	May 15, 1999	No Number	May 21, 1999	Current	ARMO, Carmacks	Pier Rienks	(867) 8
OPERATING PLAN APPROVAL - QUARTZ CLASS III	April 26, 1999	LQ00004	April 25, 2004	Current	Mineral Resources Directorate/ Mining Land Use Division	Marion E. Dejean, Chief	(867) 6
Registration Of Above-ground Fuel Storage Tank		None	Not Applicable	Current	Mineral Resources Directorate/ Mining Land Use Division	Judy St.Amand Mining Land Use Officer	(867) 6
Lease Of Federal Crown Lands				In Progress	Land Resources	Marjorie A. Fraser Head, Land Dispositions	(867) 6
YUKON QUARTZ MINING LICENCE	October 4, 1999	QLM-9902	June 30, 2006	Current	Mineral Resources Directorate/ Mining Development Division	Robert M. Holmes, Director	(867) 6

ISSUED BY FISHERIES AND OCEANS CANADA

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Pho
Approval Pursuant To The Navigable Waters Protection Act	August 15, 1999	None	50 Years	Current	Coast Guard	Colin Parkinson - Navigable Waters Protection Officer	(604) 7
Approval Pursuant To The Navigable Waters Protection Act	December 23, 1998	None	No expiry date	Current	Coast Guard	Colin Parkinson - Navigable Waters Protection Officer	(604) 7

ISSUED BY TRANSPORT CANADA - SHIP SAFETY BRANCH

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Pho
Approval	October 28, 1996	None	None	Current	Transport Canada, Ship Safety Branch	Vlodek, Szaryk Marine Surveyor	

ISSUED BY INDUSTRY CANADA

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Pho
RADIO LICENCE	April 1, 1999	16-080231349	March 31, 2000	Current	Industry Canada	Prince George District Office	(250) 56

ISSUED BY THE TERRITORIAL GOVERNMENT

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Pho
PERMIT - Purchase Of Fuel Tax Exempt	May 12, 1998	M01645	March 15, 1999	Current	Department of Finance, Taxation	Grainne Larkin Commodity Tax Officer	(867) 66
Notification Of Installation And Undertaking To Maintain A Private Sewage Disposal System	October 22, 1997	Permit No.1575	None	Current	Health And Social Services/ Environmental Health Services	Fred O'Brien Environmental Health Officer	(867) 66
Building Permit/Plumbing Permit	August 6, 1998	Permit No. 98N009BP	None	Current	Community and Transportation Services/ Public Safety Branch	Stan Duik Chief Building/Plumbing Inspector	(867) 66
Electrical Permit	None	None	None	To be Applied For	Community and Transportation Services/ Public Safety Branch	John Einarson Chief Electrical Inspector	(867) 66
Gas Inspection Report	September 23, 1998	Permit No. 3127	None	Current	Community and Transportation Services/ Public Safety Branch	Del Young Gas Inspector	(867) 66
Storage Tank System Permit	September 12, 2000	Permit No. 8	March 31, 2001	Current	Community and Transportation Services/ Public Safety Branch	John (Jack) Holesworth Fire Marshal	(867) 66
Fire Alarm System Verification Report	October 2, 1998	Report No. T0237	None	Current	Total Fire Protection Services Ltd.	Louis Paquet	(867) 66
Permit To Store And Burn Waste Oil On Site	None	None	None	To Be Applied For	Yukon Renewable Resources Environmental Protection and Assessment Branch	Janine McLennet Standards & Approvals Technician	(867) 66
Inspection of places where food is stored, prepared and consumed.	Regular Inspections	None	None	Current	Health And Social Services/ Environmental Health Services	Fred O'Brien Environmental Health Officer	(867) 66
Archeological Research Permit					Yukon Tourism /Heritage Branch	Dr. Ruth Gotthardt Archeologist	(867) 66

ISSUED BY THE MUNICIPAL GOVERNMENT

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	Phor
Approval to dispose of solid waste in the Carmacks dump.	Not Applicable	None	None	Not Applicable	Village of Carmacks	Mayor	(867) 863

OTHER APPROVALS AND PERMITS REQUIRED

Licence/Permit Name	Effective Date	Licence/Permit No.	Expiry Date	Status	Agency Responsible	Contact	
Application For A Safety Certificate To Operate A Bulk Plant					Yukon Community and Transportation Services/ Public Safety Branch	John Holesworth Fire Marshall	(867)
Radioisotope Licence					Atomic Energy Control Board		
Explosives Magazine Permit							
ANFO Permit							
Timber Harvesting Permit					DIAND, Carmacks Office	Resource Management Officer	(867)
Access To Highway					Yukon Community and Transportation Services	Maintenance Foreman Stewart Crossing	(867)

Appendix 3

Selkirk First Nation - Environmental Training

Introduction

Gartner Lee Limited, Whitehorse held an environmental training course for Selkirk First Nation members at Pelly Crossing between May 29 and May 31, 2000.

Training Material

A training manual specifically oriented to water quality sampling and site assessment for contaminants was developed by Leslie Gomm, P.Eng., Ph.D. of Gartner Lee Limited, Whitehorse. This manual and the **ENVIRONMENTAL MONITORING PLAN** developed by Minto Explorations Ltd. for the Minto Project were used as course material for the environmental training session.

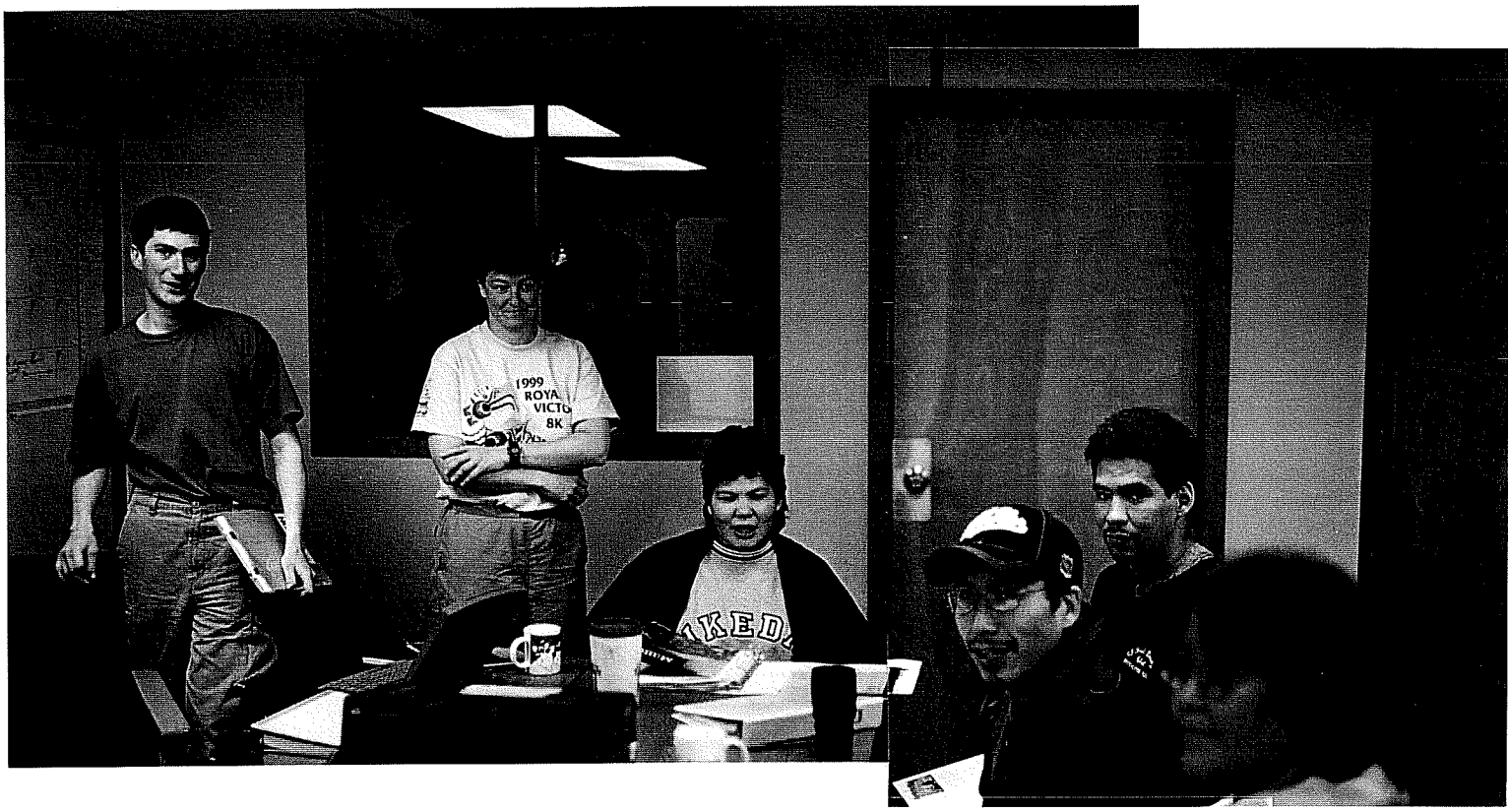
Training Course

Leslie Gomm, P.Eng., Ph.D., and K. Forest Pearson, E.I.T. of Gartner Lee Limited acted as the course instructors.

Classroom instruction for participants was provided at the Band Office in Pelly Crossing. Hands-on experience was obtained during field trips to the Pelly River and to the Minto Project site. Big River Enterprises provided transportation across the Yukon River for the project site visit on May 31, 2000.

Cost

Training course	$9,214.15
Transportation across Yukon River on May 3	100.00
Total	**$9,314.15**



Photograph #1 - Environmental training class at Pelly Crossing - 30/May/2000
Instructors K. Forest Pearson and Leslie Gomm are from Gartner Lee Limited

Photograph #2 - Field work at HW2 at Minto Creek - 31/May/2000

Photograph #3 - Obtaining water samples from Minto Creek - 31/May/2000

Appendix 4

Access Road Reclamation

Introduction

Reclamation of disturbed areas along the access road and at Big Creek in the vicinity of the Big Creek bridge was completed between May 6 and May 10, 2000. Current reclamation and construction status of the access road in the Big Creek area is shown in **Figure A4.1**.

Reclamation Work

The work crew was mobilized to site by helicopter on Saturday, May 6, 2000.

An area consisting of 100m of riverbank was planted with willow stem bundles. An area consisting of 0.7 hectare along the access road in the vicinity of Big Creek was seeded and fertilized.

Photograph #1 shows Selkirk First Nation workers planting willow stem bundles along the riverbank downstream of the overflow riprap protection. Bundles approximately 1.5m long were planted on approximately 4m spacing above the water line. Silty soil was placed in the gravel around the planted bundles for moisture retention and as a rooting medium.

Photograph #2 shows reclamation at the Big Creek bridge. A small back-hoe (Cat 416C) was used to transplant locally sourced willow clumps including root balls along the edge of the river. A number of small spruce trees and a row of willow stem bundles were also planted adjacent to willows.

Photographs #3 and #4 show Selkirk First Nation workers seeding, fertilizing and raking the open ditches along the access road at Big Creek. Growth of the planted ground cover is being assessed and spots with poor germination will be re-seeded as necessary.

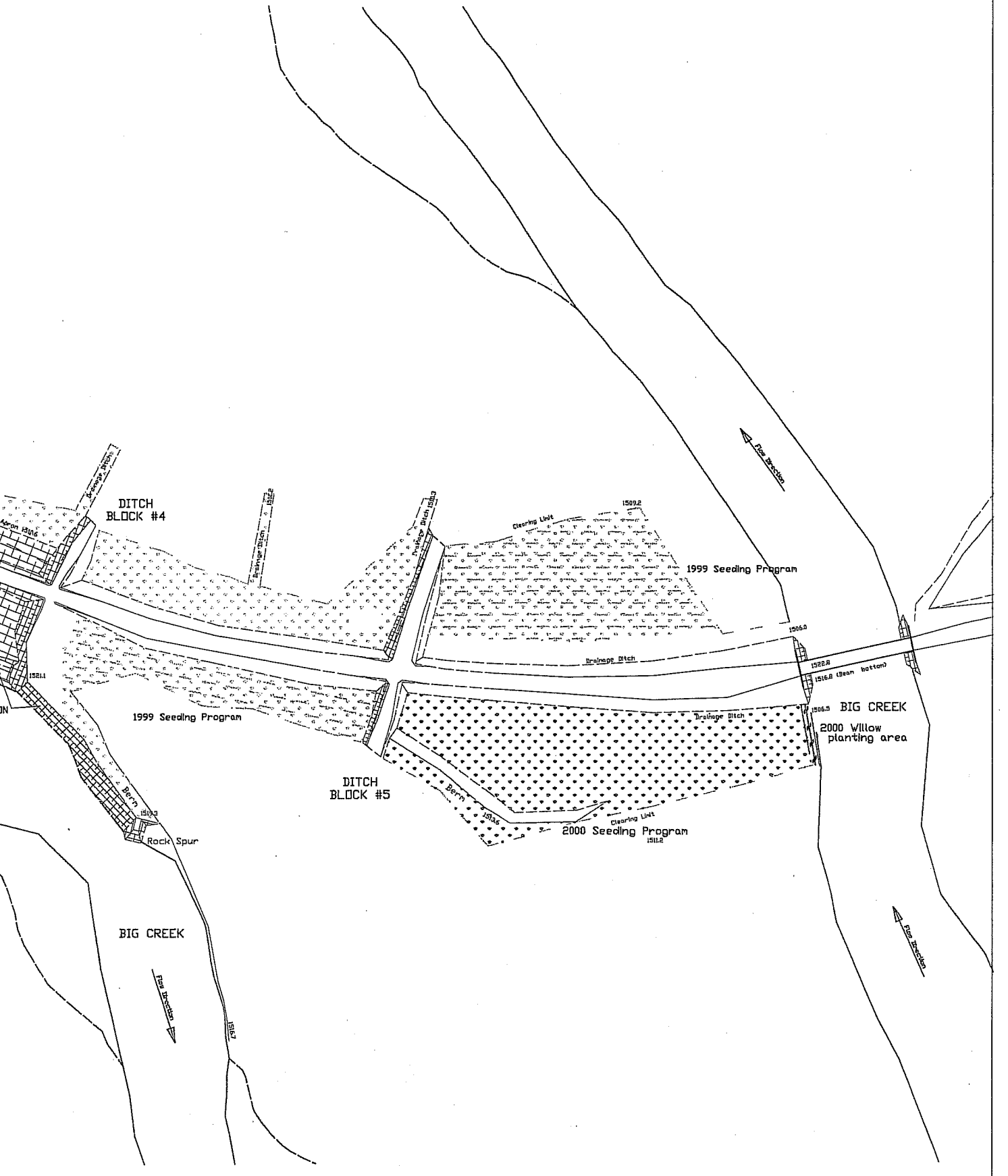
Additional seeding was carried out at the barge landing on the west side of the Yukon River at Minto and at the temporary campsite used during road construction in 1996 and 1997.

The work crew was demobilized by helicopter on Wednesday, May 10, 2000.

Assessment

Reclamation work was successful and was completed at minimal cost. Photograph #5 shows grass and willow growth on the south side of the access road at Big Creek. Photographs #6 and #7 show ditches at Big Creek containing plant cover resulting from seeding efforts in May 1999. Photographs #8 and #9 show reclamation efforts at the temporary construction camp and at the west side barge landing ramp at Minto in August 2000.

Note that natural re-vegetation has taken place along most of the access road between the barge landing and the mine. Photograph #10 shows natural regrowth along access road 3km west of Big Creek.



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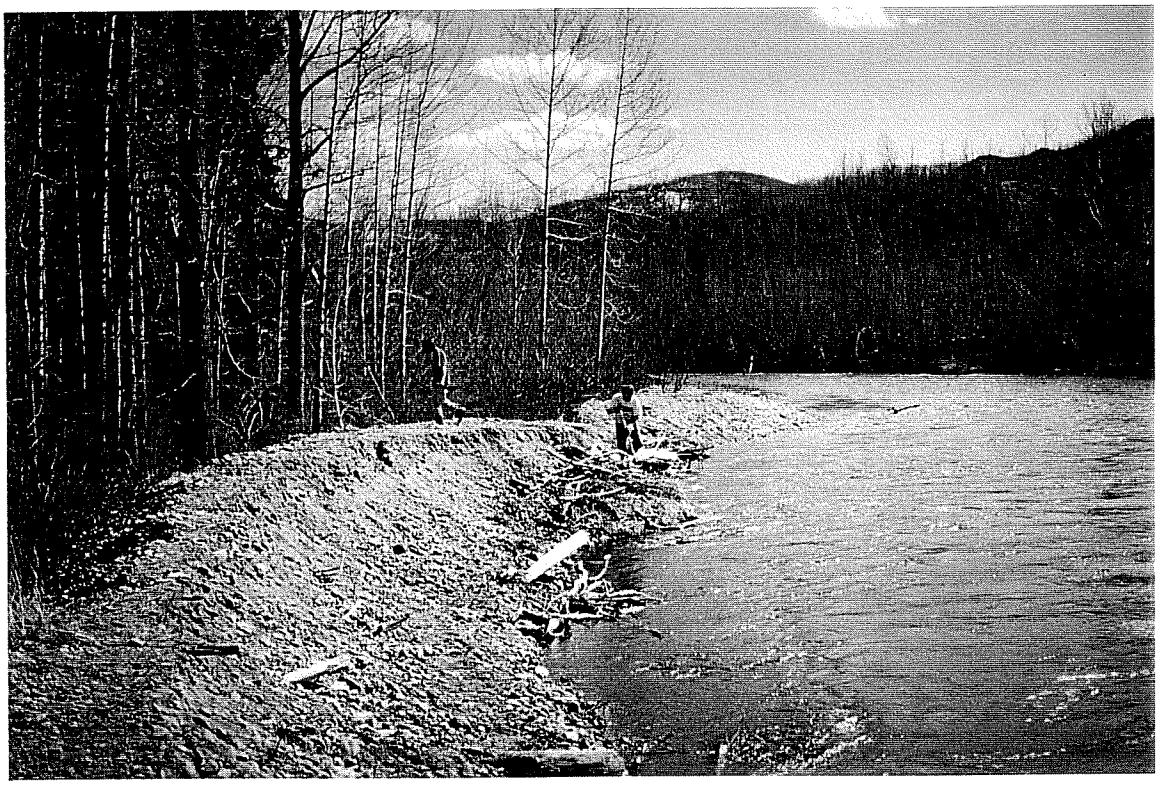
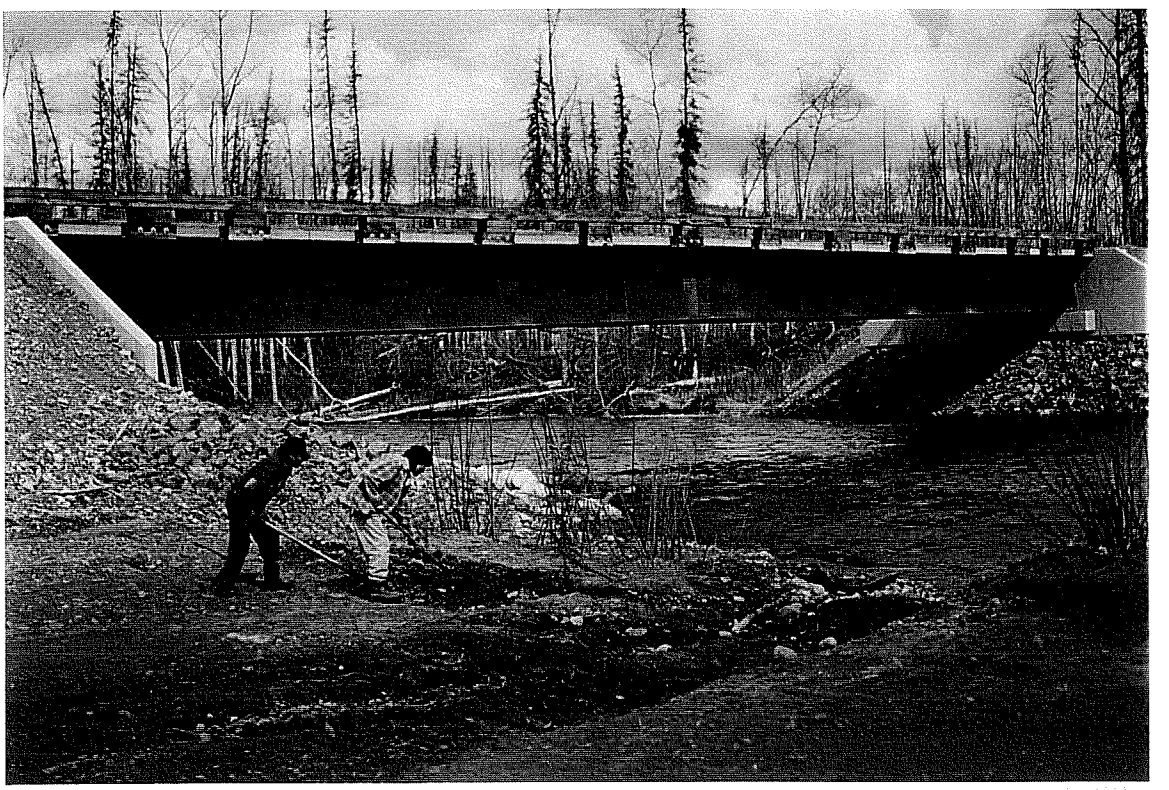
MINTO PROJECT
BIG CREEK RECLAMATION
Figure A4.1
Not to Scale

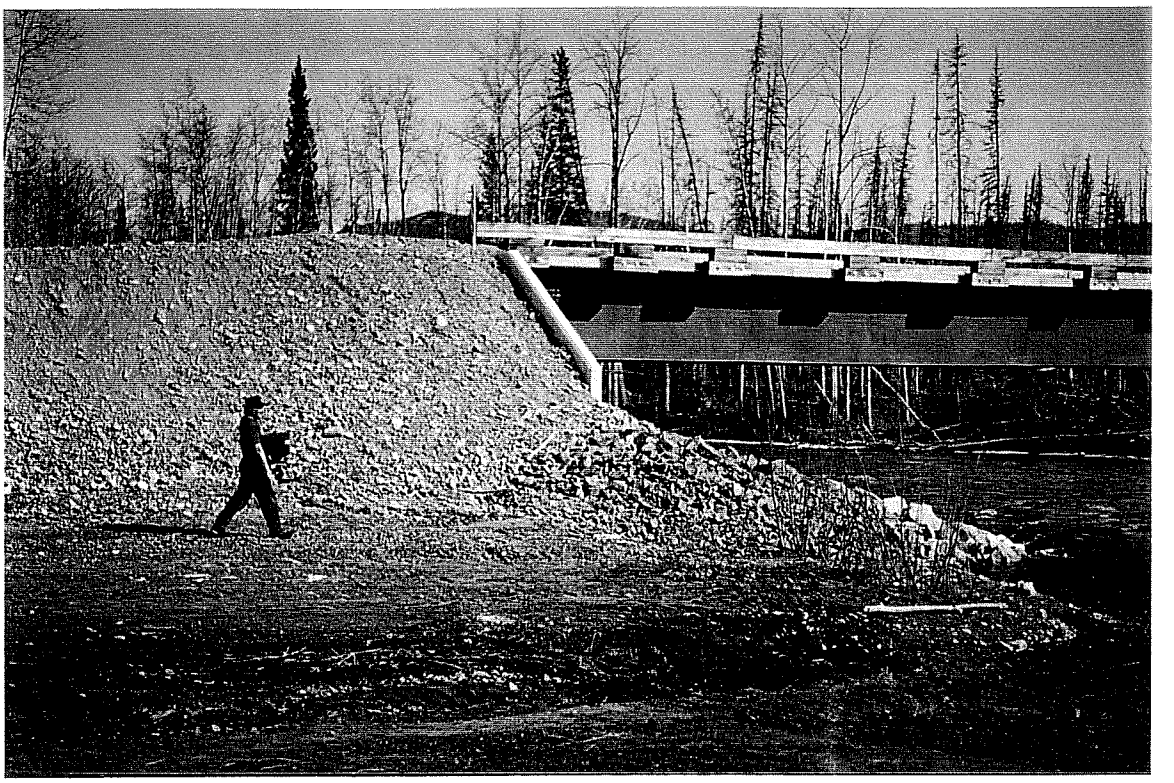
Software by Surpac Software International



Photograph #1 – Selkirk First Nation workers planting willow stem bundles along Big Creek 07/May/2000.

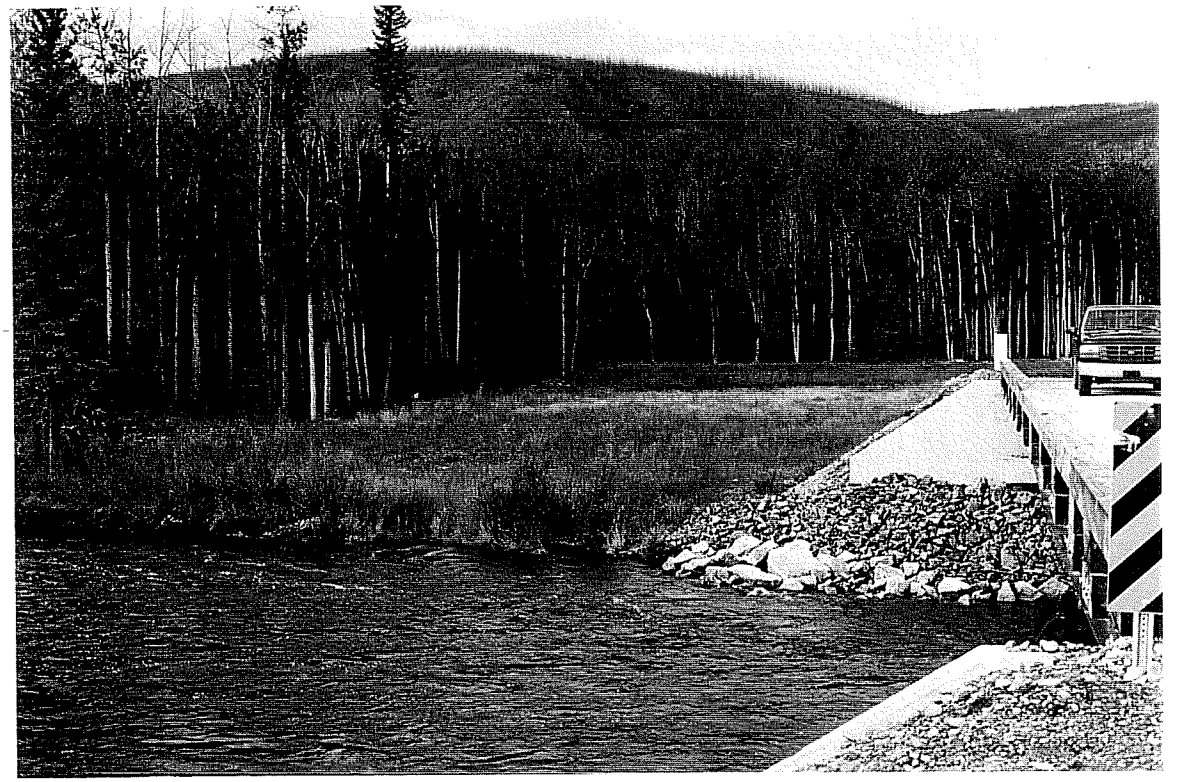


Photograph #2 - Selkirk First Nation workers planting willow stem bundles at the Big Creek bridge - 08/May/2000



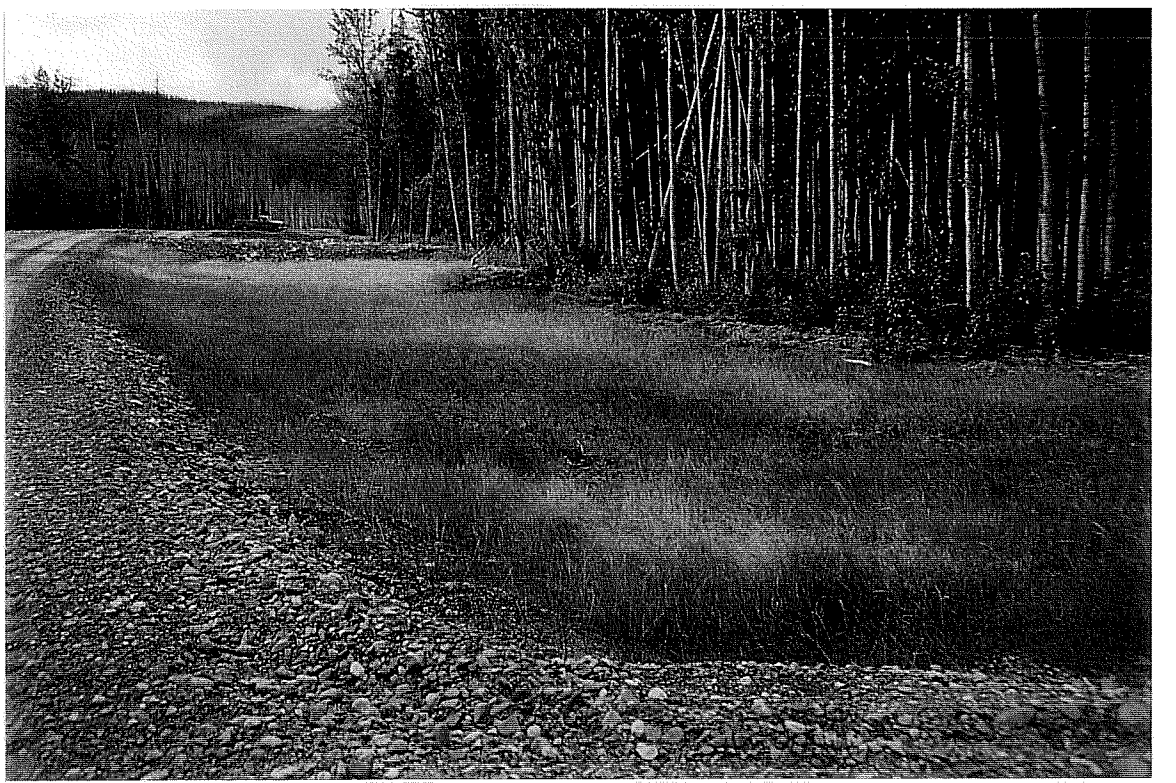
Photograph #3 - Selkirk First Nation worker seeding and fertilizing ditch area at Big Creek bridge

Photograph #4 - Selkirk First Nation workers raking planted ditch slopes - 09/May/2000



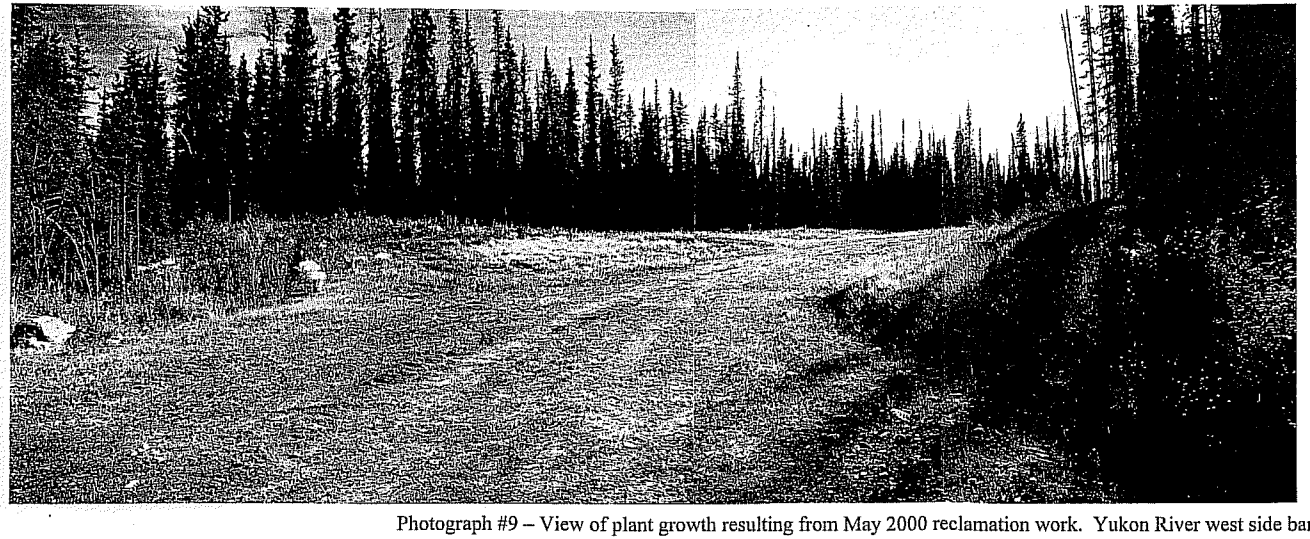
Photograph #5 – View of plant growth resulting from May 2000 reclamation work. South drainage ditch between ditch block #5 and the bridge. 17/August/2000

Photograph #6 – View of plant growth resulting from May 1999 seeding effort. South drainage ditch between ditch block #4 and #5. 05/September/1999



Photograph #7 – View of plant growth resulting from May 1999 seeding effort. North drainage ditch between ditch block #4 and #5. 05/September/1999

Photograph #8 – View of plant growth resulting from May 2000 reclamation work. Temorary construction camp at Yukon River lower barge landing ramp. 17/August/2000



Photograph #9 – View of plant growth resulting from May 2000 reclamation work. Yukon River west side barge landing ramp at Minto. 17/August/2000

Photograph #10 – View of natural plant growth along access road 3km west of Big Creek.
02/October/2000

13 ATTACHMENTS

ATTACHMENT 1 Lessons To Be Learned

Attachment 1

Lessons To Be Learned

Conclusions drawn by Jerrold Marcus, Consulting Editor, E&MJ, February 1997 on the Closing of BHP's Island Copper Mine in BC.

1 Shutdown, closure and post closure costs should be a capital expenditure item beginning with the project-approval feasibility study. While in the present value sense it may be inconsequential, nevertheless the importance of early environmental planning for reclamation and closure must be spotlighted.

2 The direct closure impact in terms of tailings handling, disposal of chemicals and hydrocarbons and pit shutdown should be an integral part of the design criteria employed during the detailed engineering phase of the project. Specifically, location of dumps should not only be dictated by transportation costs but also by reclamation and final closure suitability/plans. Ongoing reclamation and the last stage of production should be integral parts of the final closure plan.

3 The selection of key reclamation and closure alternatives should be backed up with a full suite of technical information generated by in-house experts and competent credible consultants. Supporting information should be open for inspection and both company and consulting experts should be available to provide corroborating testimony.

4 At times, a catch-22 condition may arise in that regulators can require a finalized closure plan to approve a mine project's start-up. On the other hand, company management tends to be reluctant to authorize detailed engineering of any facet of a project without prior regulatory approval.

5 Closure is a distinct phase of the mine life. During construction and operations, it is taken for granted that plans must be modified to allow for changing conditions. Similarly, the Closure Plan, no matter how detailed, should be sufficiently flexible to allow minor adjustments and even major changes as the unfolding circumstances warrant.

6 Constant communications with regulators are essential and all efforts should be made to keep them fully informed of decisions and problems. They must also be protected from either surprise and/or embarrassment. Whenever possible, it pays to take the initiative before asked to do so by the regulators. Island Copper's frequent response was: "been there, done that, here's the report." This attitude cannot be bettered.

7 Before the fact, constructive criticism should be actively sought from environmentalists for the following reasons:

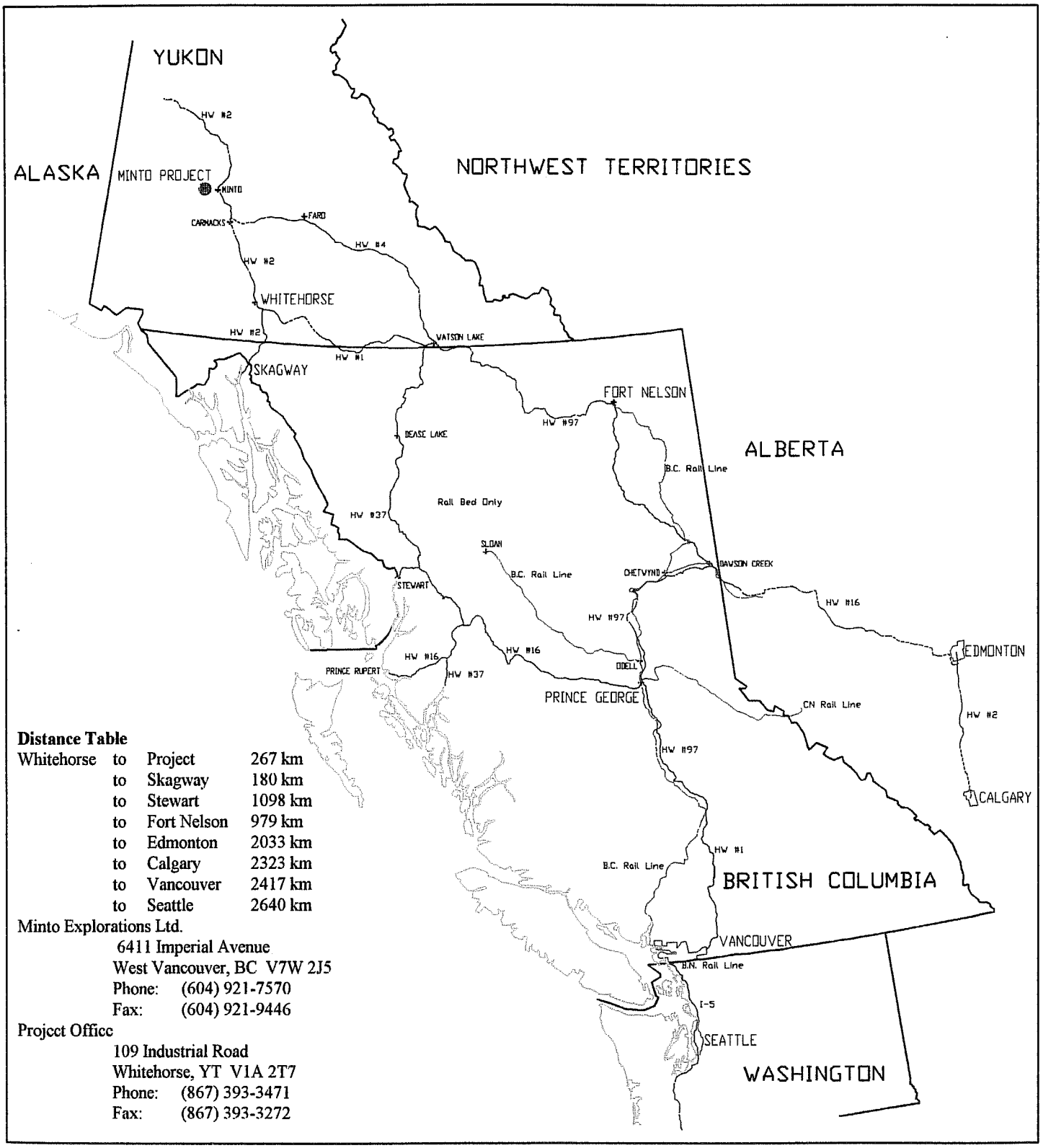
- They may notice anomalies while the project is still in the planning stage, therefore saving on costly retrofitting;
- It is better to have people working with you than against you;
- It provides background credence to the effort;

FIGURES

Minto Project

Pacific Northwest Region

Figure 1



Distance Table

Whitehorse	to	Project	267 km
	to	Skagway	180 km
	to	Stewart	1098 km
	to	Fort Nelson	979 km
	to	Edmonton	2033 km
	to	Calgary	2323 km
	to	Vancouver	2417 km
	to	Seattle	2640 km

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109 Industrial Road
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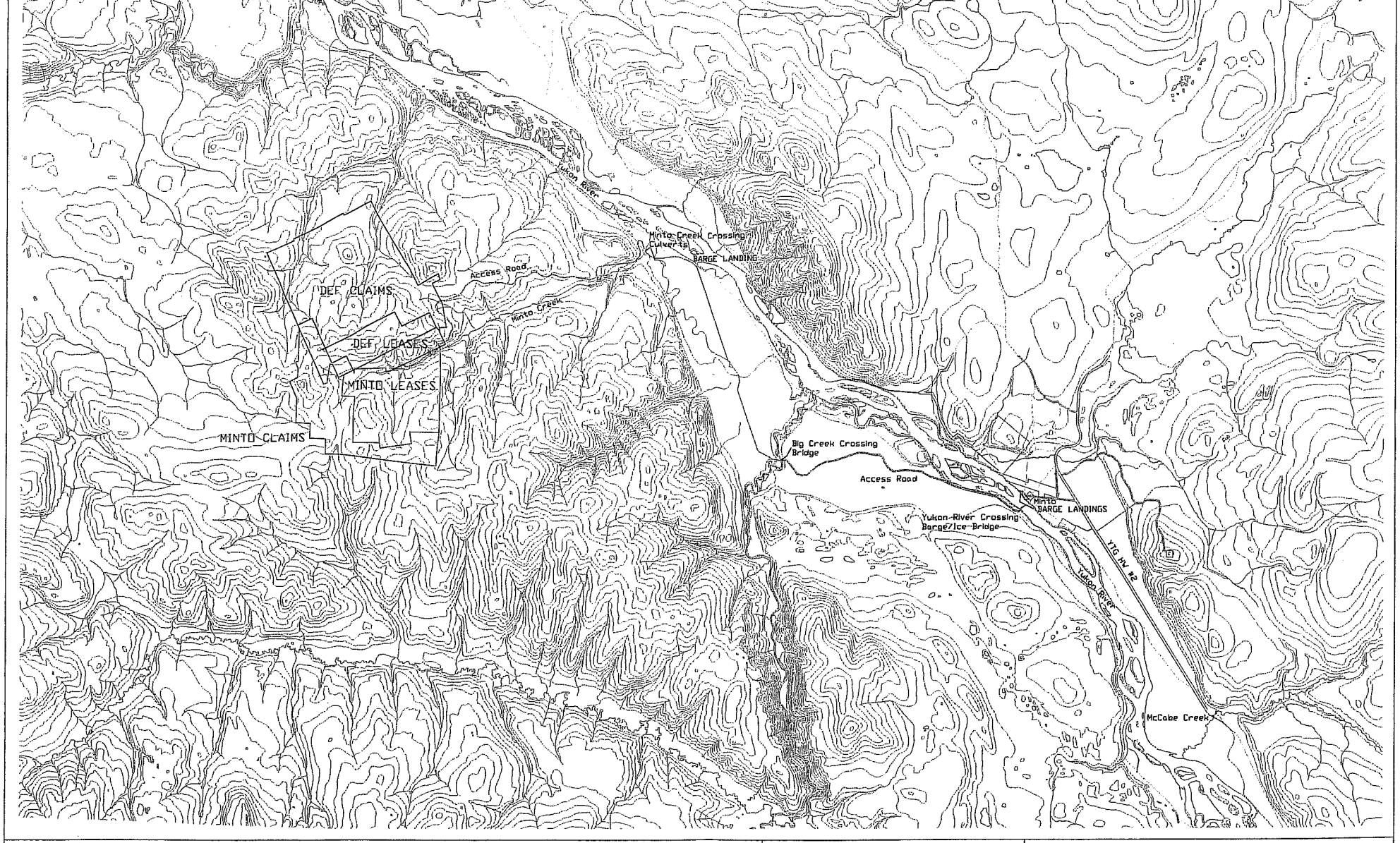

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Scale 1" = 8333.3'

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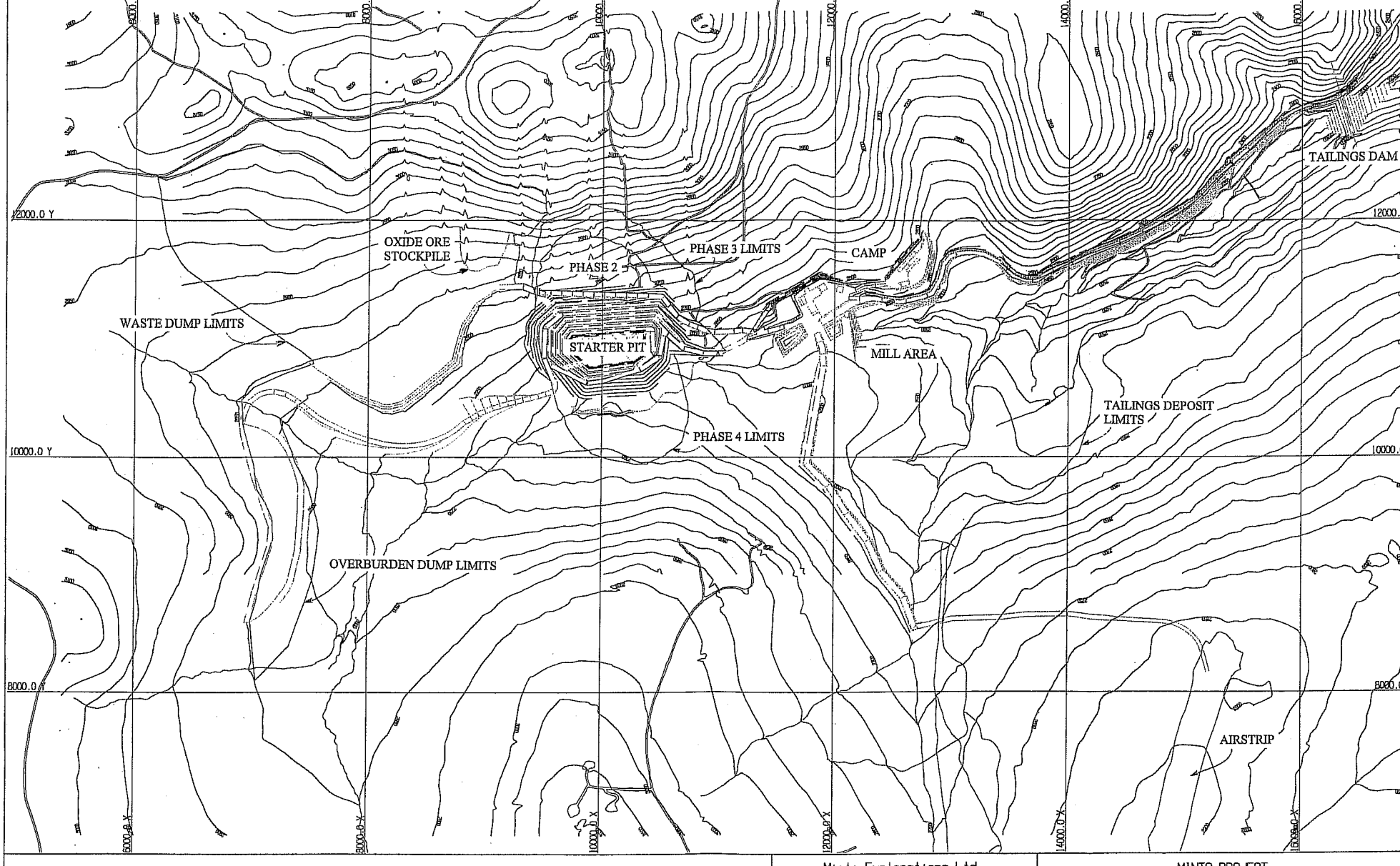
MINTO PROJECT
Project Area
Figure 2
Scale 1 : 100,000

Software by Gencom Software International



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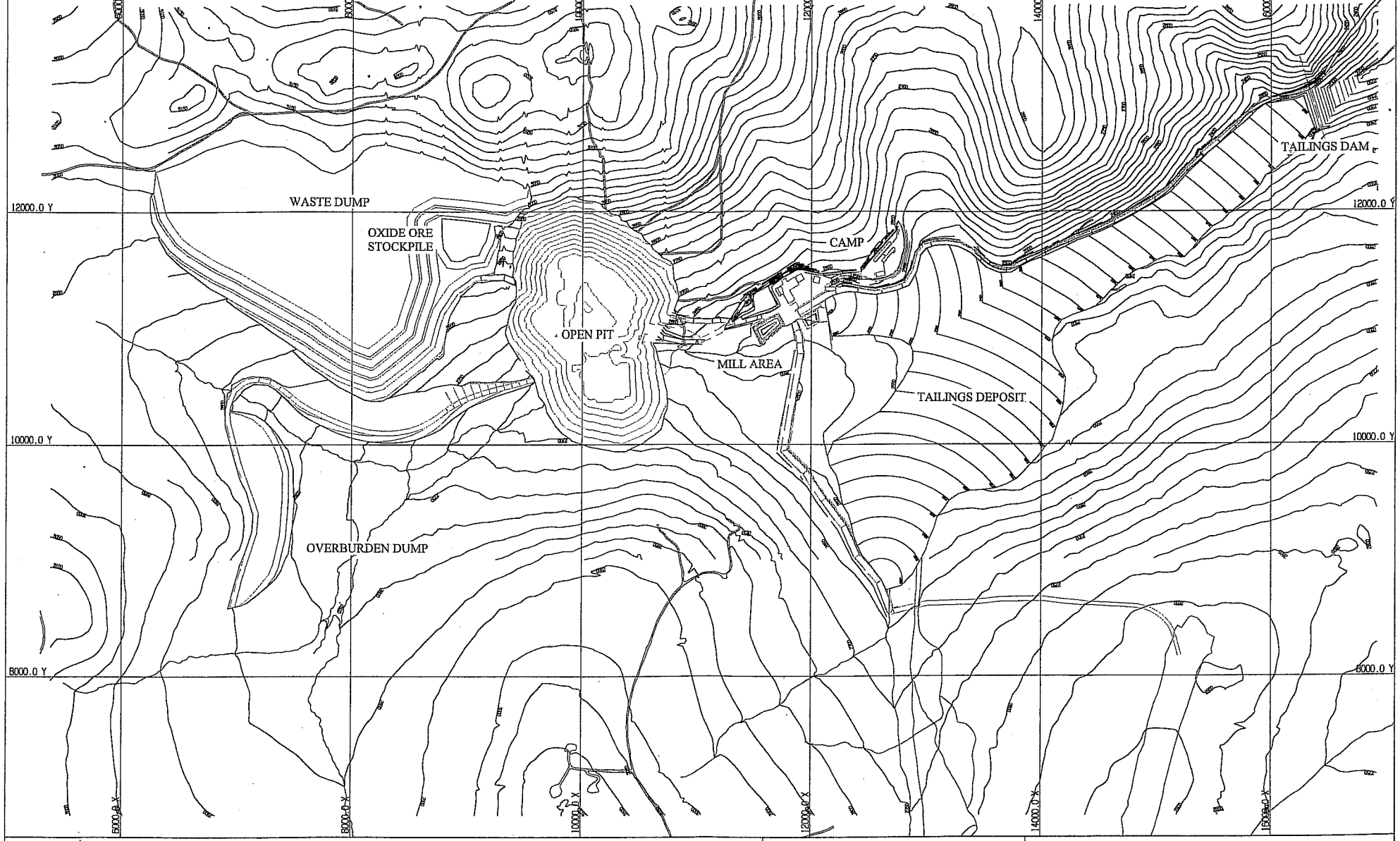
MINTO PROJECT
SITE LAYOUT - End of Construction
Figure 3
Scale 1 = 9120

Software by Gencom Software International



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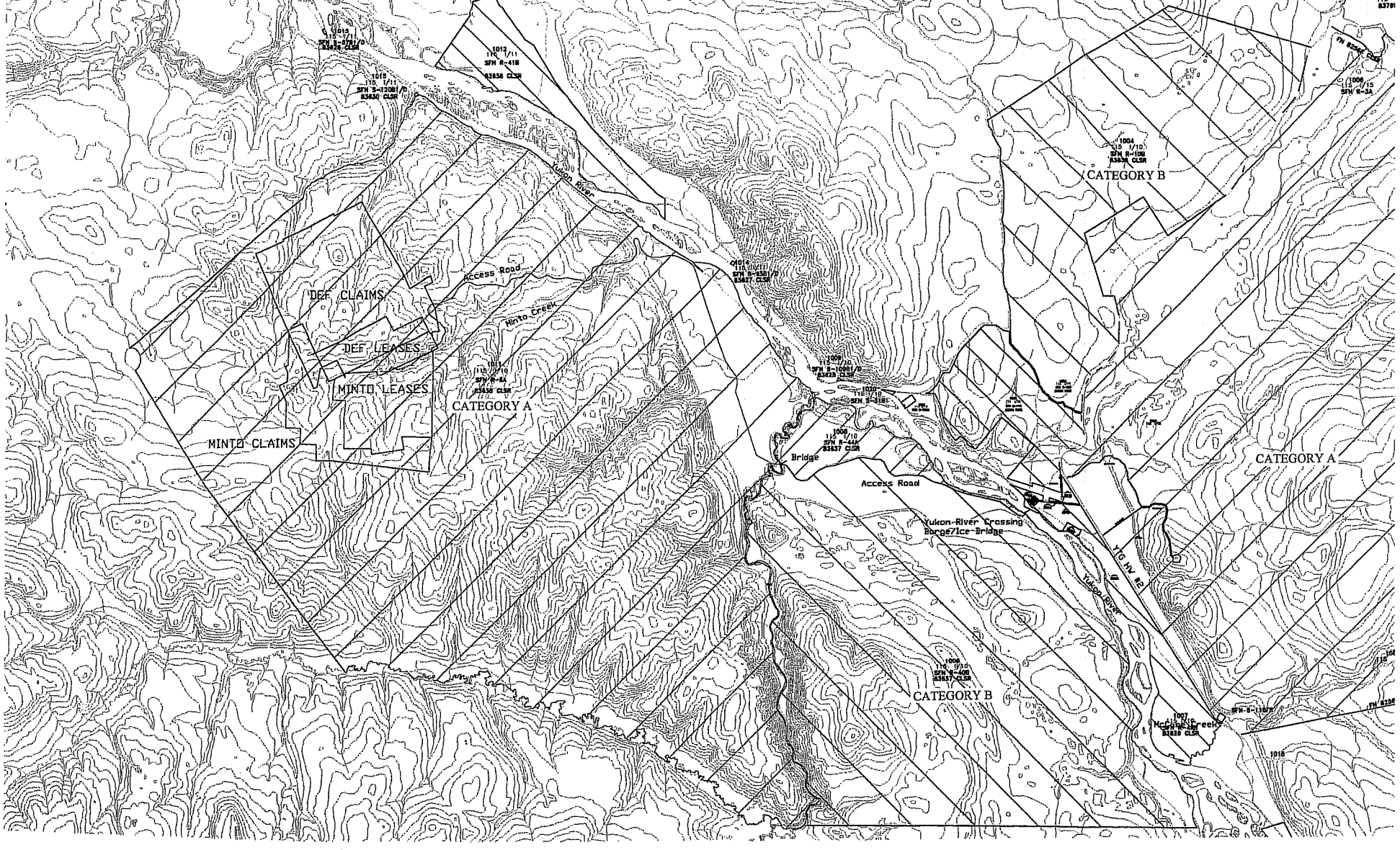
MINTO PROJECT
SITE LAYOUT - End of Mining
Figure 4
Scale 1 = 9120

Software by Rencom Software International



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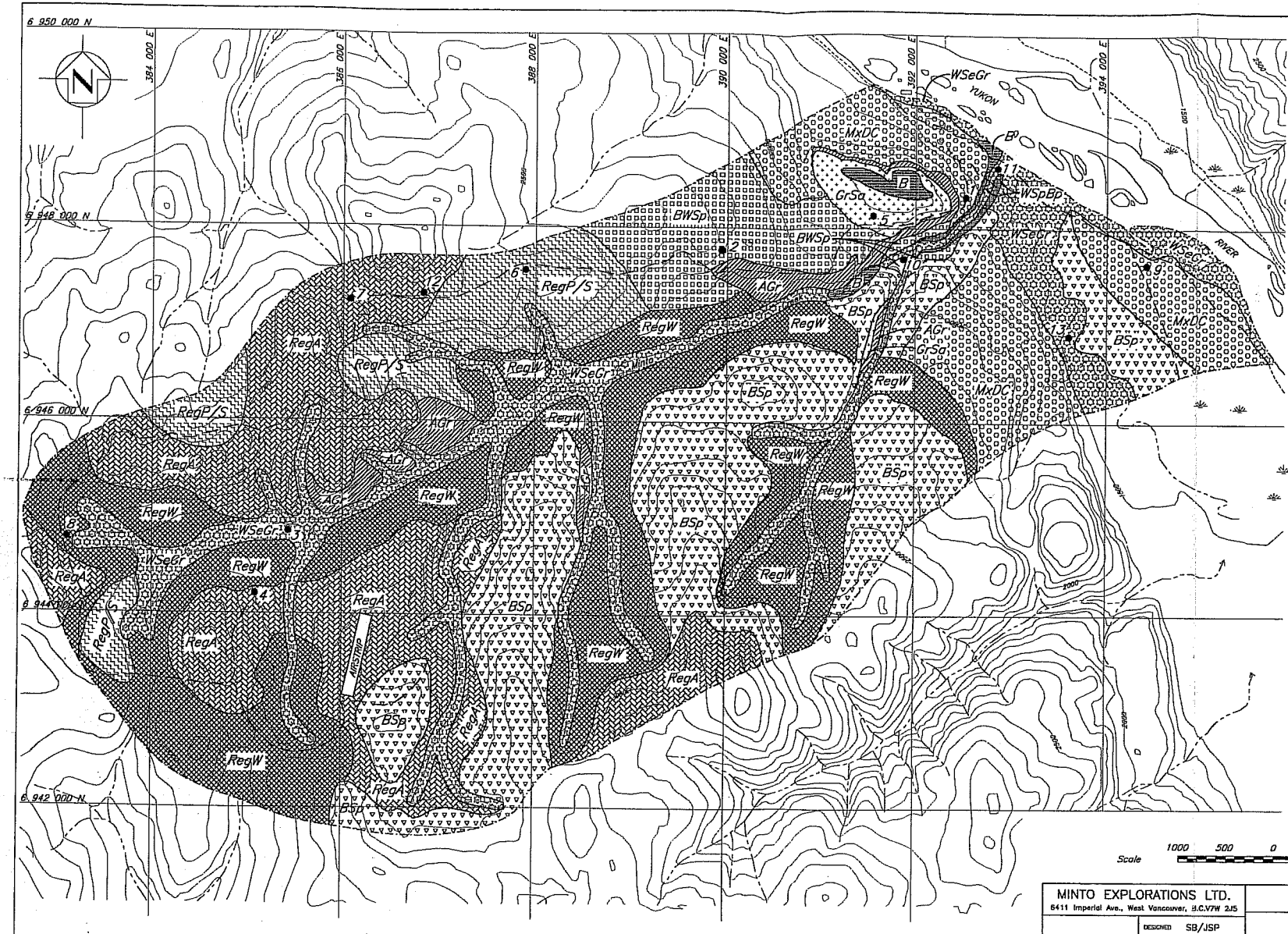
MINTO PROJECT
Project Area - Land Status
Figure 5
Scale 1 = 100,000

Software by Gencom Software International



VEGETATION COMMUNITIES:

BSp – *Black spruce*
Tree layer – black spruce
Shrub layer – willow, scrub birch, labrador tea
Groundcover – shrubby cinquefoil, bog blueberry, crowberry, red-stemmed sphagnum moss

BWSp – *Black and White spruce*
Tree layer – black and white spruce
Shrub layer – willow, wild rose, bog blueberry
Groundcover – crowberry, lingonberry, red-stemmed feathermoss, reindeer lichen

WSpBp – *White spruce/Balsam poplar*
Tree layer – white spruce, balsam poplar
Shrub layer – alder, willow, highbush cranberry
Groundcover – twinflower, horsetail, fireweed, tall lungwort

MxDC – *Mixed deciduous coniferous*
Tree layer – white spruce, trembling aspen
Shrub layer – willow, soapberry, wild rose
Groundcover – firewead, grasses, lingonberry arctic lupine, red-stemmed feathermoss, freckled lichen

RegW – *Fire regeneration, Willow, Early succession*
Tree layer – none(dead trees)
Shrub layer – willow, scrub birch
Groundcover – cloudberry, red bearberry, green sphagnum moss

RegA – *Fire regeneration, Aspen, Later succession*
Tree layer – trembling aspen, paper birch, lodgepole pine
Shrub layer – white spruce, labrador tea, dwarf blueberry
Groundcover – altai fescue, lingonberry, kinnikinnick, clubmoss, feathermoss

RegP/S – *Fire regeneration, Pine and Spruce, Later succession*
Tree layer – juvenile lodgepole pine
Shrub layer – white spruce, willow, alder
Groundcover – fireweed, lingonberry, clubmass

WSeGr – *Willow, Sedge, Grasses*
Tree layer – black spruce(very sparse)
Shrub layer – willow, scrub birch
Groundcover – sedges, horsetail, grasses, coltsfoot, sphagnum moss, red-stemmed feathermoss

AGr – *Aspen, Grasses*
Tree layer – aspen
Shrub layer – kinnikinnick, soapberry
Groundcover – altai fescue, yarrow, thoroughwort

GrSa – *Grasses, Sage*
Tree layer – aspen(very sparse)
Shrub layer – common juniper, kinnikinnick
groundcover – sage, purple reedgrass altai fescue

B – *Bedrock*

● *1* *Vegetation Quadrat*

NOTE: Contour interval 100 feet

ORG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

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DRAWN	RDT/JSP
CHECKED	
APPROVED	

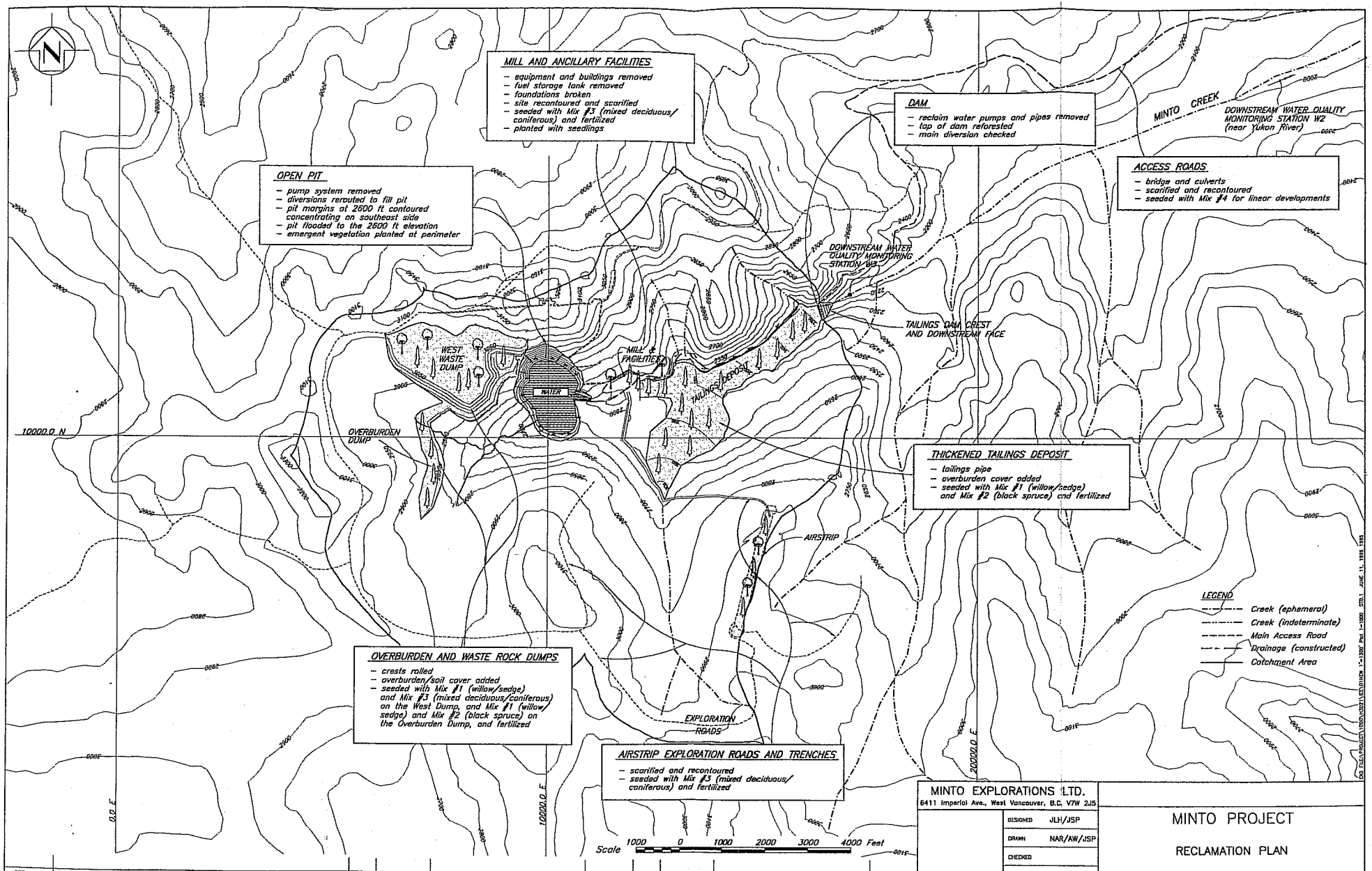
MINTO PROJECT

VEGETATION SURVEY

DATE APR. 19, 2001 | SCALE AS SHOWN | DRG. NO. FIGURE 6 | REV. 1

DWG FILE: MPSURVEY1 (8501\DWG\1 \2D\VEG Plot: 1:25 Oct. 11, 1994

MINTO EXPLORATIONS LTD.	
MINTO PROJECT Existing Disturbance	
DATE: 95/12/10	DRAWING NO:
SCALE: N.T.S.	Figure 7



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MINTO PROJECT

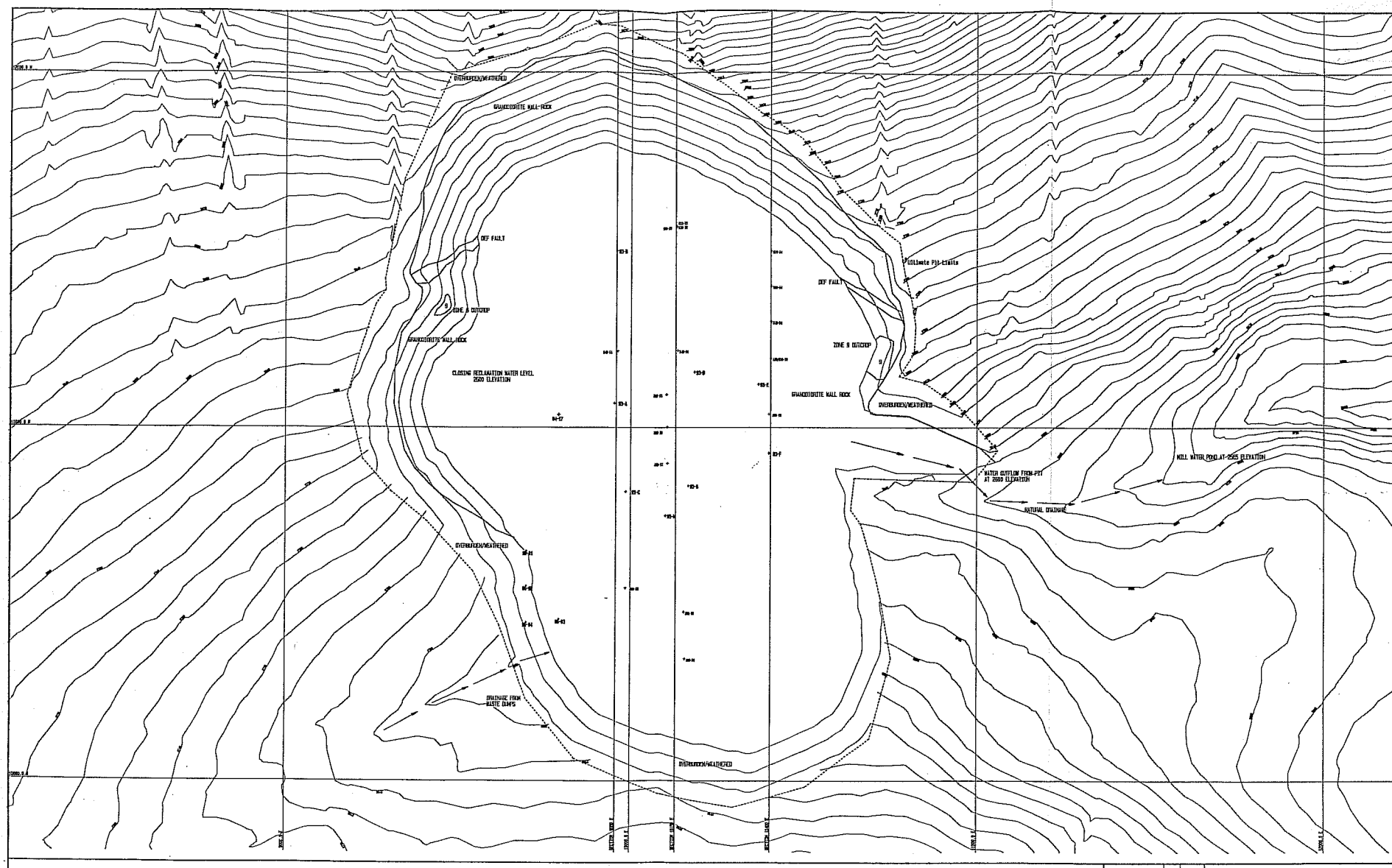
RECLAMATION PLAN

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

REV.	DATE	DESCRIPTION	APPROVED
REVISIONS			

DATE APR. 20, 2001 | SCALE AS SHOWN | DRG. NO. FIGURE 8 | REV. 1



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MINTO PROJECT, Yukon

ULTIMATE PIT SURFACE CONTOURS

DRAWN BY: jsp
DATE: 97/01/21

DRAWING NO: Figure 9

SCALE: 1 inch = 117 feet

PROJECT: Minto Acid Base Accounting

TABLES

Minto Project

Table 1

Projected Area Of Disturbance At End Of Life Of Mine (Year 11)

Reclamation Unit		Area disturbed ha	Area To Be Reclaimed ha
Overburden And Waste Rock Dumps:		52.4	40.8
Area to Be Reclaimed	ha		
Main Dump	30.8		
Oxide Stockpile	1.1		
Total	31.9		
Overburden Dump	8.9		
Grand Total	40.8		
Mill And Ancillary Facilities		4.7	4.7
Open Pit		24.4	5.0
Thickened Tailings Deposit (Area covered by 5,910,000 t of tailings)		59.4	59.4
Tailings/Water Dam And Diversion Ditch		2.0	1.0
Air Strip, Exploration Roads And Trenches (Area made up of numerous roads and trenches)		21.0	21.0
Access Road (Area to be reclaimed is a strip approximately 5 m wide by 30 km long or 15 ha)		90.0	15.0

Minto Project

Table 2

Suggested Seed Mixes For Reclamation Test Plots at the Minto Project

Native Species	Mix #1 Willow/Sedge kg/ha	Mix #2 Black Spruce kg/ha	Mix #3 Mixed Deciduous/ Coniferous kg/ha	Mix #4 Linear Development kg/ha	Mix #5 Sand/Gravel Cut Slopes kg/ha
Yukon wheatgrass			2	3	4
Violet wheatgrass			6	8	6
Northern fescue			2	3	
Arctic lupine			2	2	
Yellow locoweed				1	1
Glaucous bluegrass			2	3	3
Meadow foxtail	3	5			
Tufted hairgrass	4	4			
Polargrass		1			
Bluejoint reedgrass	1	1			
Altai fescue		6			
Fowl bluegrass	8				
Sheep fescue			2	3	5
Showy locoweed				1	
Sweetgrass			1		
Total	16	17	17	24	19

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)

Rec-Seed.123

Minto Project

Table 3

Nutrient Requirements and Recommended Fertilizers
Reclamation Test Plots at the Minto Project

	Mix #1 Willow/Sedge kg/ha	Mix #2 Black Spruce kg/ha	Mix #3 Mixed Deciduous/ Coniferous kg/ha	Mix #4 Linear Development kg/ha	Mix #5 Sand/Gravel Cut Slopes kg/ha
Nutrient requirements					
Nitrogen	50	80	80	100	120
Phosphate	100	80	-	120	120
Potash	-	60	-	100	100
Commercial Fertilizer (N-P-K) *	300 (17-34-0)	400 (16-20-0) + 60 K2O or 500 (16-16-16) with 3% S	250 (34-0-0)	400 (28-28-0)	480 (28-28-0) + 150 (0-0-60)

* Recommended commercial fertilizer to meet above nutrient requirements.

(adapted from Kennedy 1993)
Rec-Seed.123

Minto Project
Table 4
Reclamation Schedule

Description		Water Licence	Construction	Phase I	Phase II	Phase III & Closing Reclamation				
				Year 1	Years 2 - 11	Year 12	Year 13	2017	2018	2019
		1997/ 1998	2001 - 2002	2003 JFMAMJJASOND	2004 - 2013 2 3 4 5 6 7 8 9 10 11	2014 J F M A M J J A S O N D	2015 J F M A M J J A S O N D	JFMAMJJASOND	JFMAMJJASOND	JFMAMJJASOND
Remedial Work										
Reclamation Research										
Overburden and Waste Rock Dumps	- Cap									
	- Seed & Re-seed									
	- Reforest									
Mill and Ancillary Facilities	- Remove									
	- Recontour & Scarify									
	- Seed & Re-seed									
Open Pit	- Flood									
	- Recontour & Scarify									
	- Seed & Reseed									
	- Reforest									
Thickened Tailings Deposit	- Cap									
	- Seed & Reseed									
Diversion Ditch	- Recontour									
Dam	- Recontour									
	- Reforest									
Air Strip, Exploration Roads & Trenches	- Recontour									
	- Scarify									
	- Seed									
Access Road	- Remove Bridge & Culverts									
	- Recontour & Scarify									
	- Seed									
Post-Closure Monitoring										

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Minto Project

Table 5

Reclamation Research Cost

The following is a life-of-mine estimate and incremental costs are shown only:	$
Cost of setting up a greenhouse and equipment - allowance only	10,000
Operation and maintenance of the facilities and equipment - 10 years @ $5,000	50,000
Test plots and reclamation trials - seeding and re-seeding - 11 ha @ $1,250	13,750
Soils testing - 10 years @ $500	5,000
Summer students - wages and support costs - 10 years @ $22,000	220,000
Consultant - 10 years @ $5,000	50,000
	$348,750
	Say $349,000

The estimated annual cost of Reclamation Research is $34,900.

Notes:

1. Reclamation Research will be done during Phase II (Year 2 To Year 11) or for 10 years.
2. Labour and equipment will be provided to support Reclamation Research as required. These support costs will be absorbed as part of operating costs.
3. It is expected that summer students will complete the work each year with assistance and supervision provided by an Environmental Technician employed by the Minto Project.

Minto Project

Table 6

Basis Of Reclamation Cost Estimate

Labour Rate:

The labour rate is $30.00 per hour for 10 hours of work per day - daily rate	$300

Contract Equipment Rates:

Dozer plus operator @ $150.00/hour for 10 hours of work per day - daily rate	$1,500
Backhoe plus operator @ $80.00/hour for 10 hours of work per day - daily rate	$800
Excavator plus operator @ $150.00/hour for 10 hours of work per day - daily rate	$1,500

Costs Of Moving Overburden:

The rate for moving overburden is $3.00/$m^3$. This is overburden that will be mined from a stockpile and will include loading, hauling and spreading and minimal levelling.

Cost Of Moving Coarse Rock:

The rate for loading, hauling and dumping pit-run shot rock is $3.50/$m^3$.
The rate for loading, hauling and placing oversize coarse rock is $4.65/$m^3$.

Rates For Seeding And Re-seeding:

Initial seeding - $4.00/kg @ 75 kg/ha	$300/ha
Initial fertilizing - $1.00/kg @ 450 kg/ha	$450/ha
	$750/ha
Re-seeding - $4.00/kg @ 50 kg/ha	$200/ha
Re-fertilizing - $1.00/kg @ 300 kg/ha	$300/ha
	$500/ha

Rates For Reforestation:

Cost of tree seedlings - $0.50/tree @ 1100 stems/ha	$550/ha
Cost of tree planting - $0.32/tree @ 1100 stems/ha	$350/ha
	$900/ha

Freight Rate:

Average charge per load of freight from the mine to Whitehorse for a round trip	$1,000

Notes: All costs are in 2001 $ and were confirmed by a contractor in Whitehorse.

Minto Project

Table 7

Mill And Ancillary Facilities

	$
Mill/workshop/warehouse and mill equipment, offices and camp	0
Site cleanup crew - 2 men for 120 days @ $300	72,000
Support equipment at 1/3 of labour cost	24,000
Remove bulk fuel storage tank - 2 men for 20 days	12,000
Support equipment at 1/3 of labour cost	4,000
Reclaim septic system – 2 men for 1 day	600
Support equipment at full labour cost	600
Break down mill footings - 2 men for 5 days @ $300	3,000
Support equipment at 1/3 of labour cost	1,000
Freight - 35 loads @ $1,000	35,000
Re-contour - 1 dozer for 10 days @ $1,500	15,000
Overburden cap - 2,500 m^3 @ $3.00	7,500
Scarify - 1 dozer for 2 days @ $1,500	3,000
Seed and fertilize - 4.7 ha @ $750	3,500
Re-seed - 1.5 ha @ $500	750
Reforest - 1 ha @ $900	900
	$185,850
	Say $186,000

Notes:

1. The mill with the equipment and the workshop/warehouse, the offices and assay laboratory and the camp will be sold by auction. The items will be sold on an "As-is, Where-is" basis and all sales will include removal from site at the purchaser's cost. It is assumed that the asset sale will offset the cost of removing all buildings and equipment. Site support will be provided at cost and the camp will therefore be the last major item to be removed.

2. Allowance has been made for a two-man cleanup crew with the necessary support equipment to remove all items not covered by the auction above and to load a truck for shipment to Whitehorse. Allowance has been made for 35 loads of general freight to Whitehorse.

3. Allowance has been made for re-seeding 1/3 of the area. Reforesting will be done in selected areas only.

Minto Project

Table 8

Open Pit

	$
Place rocks - 1 rock up to 1 m in diameter every 4 m	0
Remove pit pumps and pipe and general cleanup - 2 men for 4 days @ $300	3,000
Support equipment - 1/3 of labour cost	1,000
Divert Minto Creek into the open pit – Allowance	15,000
Excavate outlet from the open pit to Minto Creek – Allowance	15,000
Re-contour - 1 dozer for 15 days @ $1,500	22,500
Scarify - 1 dozer for 2 days @ $1,500	3,000
Seed and fertilize - 5 ha @ $750	3,750
Re-seed - 2 ha @ $500	1,000
Re-forest - 2 ha @ $900	1,800
Plant emergent vegetation for future wetland - allowance	5,000
	$56,050
	Say $56,000

Notes:

1. Rocks will be placed along the rim of the pit as each cut is completed as an ongoing safety precaution. No additional work required at the end of the life of the mine.

2. No work will be required in the short stretch of Minto Creek between the rim of the open pit and the mill water pond.

Minto Project

Table 9

Thickened Tailings Deposit

	$
Remove reclaim water pump and reclaim water line - 2 men for 5 days @ $300	3,000
Support equipment at 1/3 of labour cost	1,000
Construct diversion ditch – contractor's all-found cost estimate	150,000
Overburden cap 25 cm thick - 148,500 m^3 @ $3.00	445,500
Seed and fertilize - 59.4 ha @ $750	44,550
Re-seed - 29.7 ha @ $500	14,850
	$658,900
	Say $659,000

Notes:

1. Allowance has been made for re-seeding 1/2 of the total area covered by the tailings.

Minto Project

Table 10

Overburden And Waste Rock Dumps

	$
Roll crests - 1 dozer for 15 days @ $1,500	22,500
Waste rock dump overburden cap 25 cm thick - 79,750 m^3 @ $3.00	239,250
Prepare overburden dump for seeding	12,000
Seed and fertilize – 40.8 ha @ $750	30,600
Re-seed - 20.4 ha @ $500	10,200
Re-forest - 15 ha @ $900	13,500
	$350,550
	Say $351,000

Notes:

1. The overburden from the south side of the open pit mined in Phase I is disposed of on the overburden dump and is thus available for closing reclamation. The overburden remaining on the dump will then be prepared for seeding at a cost of $12,000 as shown above.

2. Allowance has been made for re-seeding one half of the total reclaimed area. Re-foresting will be done in selective areas only. Current indications are that natural re-seeding will be quite effective.

Minto Project

Table 11

Tailings/Water Dam And Diversion Ditch

	$
Remove reclaim water pump and pipes, the reclaim line and do a general	
Clean-up in the vicinity of the dam - 2 men for 9 days @ $300	5,400
Support equipment at 1/3 of labour cost	1,800
Backfill main water storage pond with pit-run coarse rock – 80,000m^3 @ $3.00	240,000
Excavate overburden in the area of the downstream toe of the dam – Allowance	9,000
Place oversize rock on the downstream side of the dam – 35,000m^3 @ $4.65	162,750
Construct the spillway with riprap – 3,400m^3 @ $4.65	15,810
Construct diversion ditch – contractor's all-found cost estimate	150,000
Survey control and engineering supervision	30,000
Work on riparian areas downstream of the dam - allowance	5,000
Reforest - 1 ha @ $900	900
	$620,660
	Say $621,000

Notes:

1. The face of the dam will consist of coarse rock and will not be reclaimed

2. It is assumed that the diversion ditches will be incorporated in the thickened tailings deposit as per the cost estimate provided above. The existing diversion ditch between the camp and the tailings/water dam will be allowed to fill with loose material from the slopes above the ditch.

Minto Project

Table 12

Air Strip, Exploration Roads And Trenches

	$
Re-contour - backhoe for 30 days @ $800	24,000
Re-contour and scarify - dozer for 20 days @ $1,200	24,000
Seed and fertilize - 21 ha @ $750	15,750
	$63,750
	Say $64,000

Notes:

1. No re-seeding will be required. Evidence on site shows rapid re-growth by native species. The important aspect of reclamation will therefore be ground preparation.

Minto Project

Table 13

Access Road

	$	$
Remove Big Creek bridge:		
Remove bridge decking - 3 men for 5 days @ $300	4,500	
Remove bridge - 4 men for 10 days @ $300	12,000	
Support equipment - allowance	15,000	
Cut off piles - 3 men for 5 days @ $300	4,500	
Re-contour with backhoe - 3 days @ $800	2,400	
Re-contour with dozer - 3 days @ $1,500	4,500	
Seed and fertilize - 1 ha @ $750	750	
	43,650	43,650
Reclaim barge ramps:		
Remove all gravel - excavator for days @ $1,500	1,500	
Recontour areas & scarify - dozer for 1 days @ $1,500	1,500	
Seed and fertilize - 2 ha @ $750	1,500	
	4,500	4,500
Remove 40 small culverts - 2 men for 20 days @ $300		12,000
Remove 3 large culverts - 3 men for 3 days @ $300		2,700
Support equipment - 100 % of labour costs		17,700
Recontour - 1 dozer for 21 days @ $1,500		31,500
Scarify - 1 dozer for 20 days @ $1,500		30,000
Seed and fertilize - 18.3 ha @ $750		13,730
		$155,780
		Say $156,000

Note:

1. It is assumed that the access road and the barge landing on the east side of the Yukon River will remain as it is used by the public for access to the Yukon River.

2. No allowance has been made for the salvage value of the bridge although this can sold as part of the auction.

3. Only the road bed and the areas re-contoured once culverts have been removed will be scarified and seeded and fertilized. Total area is estimated as 18.3 ha. No re-seeding will be required. Evidence along the present access trail shows rapid re-growth by native species.

Minto Project

Table 14

Site Support

	$
Project Manager for twelve months plus burden	85,800
Project Foreman for nine months plus burden	52,650
Project Engineer for nine months plus burden	52,650
Environmental Technician for nine months plus burden	35,100
Monitoring expensed during decommissioning	
Secretarial and accounting support for twelve months plus burden	62,400
General administrative expenses	41,000
Site support	378,000
	$654,950
	Say $655,000

Notes:

1. Allowance has been made for support on site for a period of 9 months while the mill and ancillary facilities are being dismantled and removed and the closing reclamation is being completed. Administrative support will be provided for a period of twelve months from the existing offices in Whitehorse.

Minto Project

Table 15

Post-Closure Monitoring Program

Area	Site	Parameter	Activity	Frequency	Comments
Minto Creek	W-2 and W-3	Surface Water Quality	Sample	Spring, Fall	Consultant to sample 2 sites.
	To Be Determined	Groundwater Quality	Sample	Annual	Consultant to sample.
Reclamation	All Reclaimed Areas	Vegetation Success	Inspect	Spring, Summer	
	Minto Creek Valley	Wildlife Use	Survey	Annual	Survey done by a wildlife biologist.
Mine	Tailings/Water Dam Diversion Ditch Drainage Ditch Overburden Dump Waste Rock Dump	Physical Condition	Joint inspection by consulting engineer and Licensee	Annual	i Inspection to be completed before July 1 of each year. ii Independent Review and Recommendation Report submitted within 45 days of inspection. iii Annual Report to include details of how the Licensee has addressed recommendations.

Note: Mine personnel will do an inspection of all physical structures during every site visit.

Minto Project

Table 16

Post-closure Monitoring Cost

	$
Water sample collection - 6 days @ $450	2,700
Physical inspection by geotechnical consulting engineer - 4 days @ $1,000	4,000
Physical inspection by mine personnel - 8 days @ $450	3,600
Wildlife survey - 5 days @ $450	2,250
Selkirk First Nation members - 14 days @ $350	4,900
Prepare and submit annual report to the Water Board – 3 days @ $450	1,350
Water sample analysis - 6 samples @ $450	2,700
Accommodation and meals in Carmacks – 11 nights @ $130	1,430
Equipment charges	500
Airfreight for water samples to Vancouver	300
Travel from and to Whitehorse	1,600
Miscellaneous costs	500
Total	$25,830
	Say $26,000

Minto Project

Table 17

Reclamation Cost Summary

Item	Table No.	$
Reclamation Research	5	349,000
Mill And Ancillary Facilities	7	186,000
Open Pit	8	56,000
Thickened Tailings Deposit	9	659,000
Overburden And Waste Rock Dumps	10	351,000
Tailings/Water Dam And Diversion Ditch	11	621,000
Air Strip, Exploration Roads And Trenches	12	64,000
Access Road	13	156,000
Site Support	14	655,000
Sub-total		**3,097,000**
Consulting engineering services		60,000
Grand Total		**3,157,000**
Post-closure monitoring costs per year and required for three years		$26,000

Notes:

1. All costs are in current or 2001 $.
2. No contingency has been provided, as this would be an arbitrary number.