Canada – Lupin Mine
NWB Water License No: 2AM-LUP0914

2010 Annual Report to the Nunavut Water Board

March 31, 2011

DOCUMENT CONTROL

Revision No	Date	Details	Author	Approver
	07/3/10	Reformatted to MMG standard		
	17/3/10	Revised and updated for 2009 reporting period	A. Mitchell	
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APPENDICES

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INTRODUCTION

This report is submitted to fulfil requirements under Part B, Item 2 of Water License 2AM-LUP0914, granted by the Nunavut Water Board (NWB) pursuant to the Nunavut Waters and Nunavut Surface Rights Tribunal Act and of the Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada.

The Annual Report for 2010 contains the following information that is required under Part B, Item 2 and Schedule B, Items 1, (a) through (n):

a) The monthly and annual quantity in cubic metres of water pumped from Contwoyto Lake at Station Number LUP-01;

b) The monthly and annual quantities in cubic metres of treated tailings effluent discharged at Station Number LUP-10

c) The monthly and annual quantity in cubic metres of Minewater discharged at Station Number LUP-11;

d) The monthly and annual quantities in cubic metres of treated Sewage Effluent discharged at Station Number LUP-14;

e) Tabular summaries of all data generated under the Monitoring Program;

f) A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an inspector.

g) A summary of modification and/or major maintenance work carried out on the water supply and the waste disposal facilities, including all associated structures;

h) A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken;

i) Where applicable, revisions as Addendums, with an indication of where changes have been made for Plans, Reports, and Manuals.

j) For Care and Maintenance, provide an updated status of any progressive reclamation as it relates to tailings cover remediation and justification for not proceeding to full reclamation under Part I, Item 5;

k) A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions

l) A summary of any abandonment and reclamation work completed during the year and an outline of any work anticipated for the next year;

m) An updated assessment of the current mine reclamation liability using RECLAIM as required by Part 1, Item 3; and

n) Any other details on water use or waste disposal requested by the Board by November 1st of the year being reported.

A. FRESH WATER INTAKE VOLUME: STATION LUP-01

The quantity of fresh water obtained on a monthly basis from Contwoyto Lake is shown below in Table 1**.** A total of 272.13 m^3 of water was collected from Contwoyto Lake at the fresh water intake at the Lupin Mine Site for on site use in 2010 while under care and maintenance.

Table 1 – Monthly Water Consumption, Lupin Mine, Monitoring Station LUP-01	
Month	**Quantity (m3)**
January	NIL
February	NIL
March	NIL
April	12.00
May	52.00
June	50.43
July	50.50
August	87.20
September	20.00
October	NIL
November	NIL
December	NIL
TOTAL	272.13

As per the monitoring requirements outlined in Part J, Item 1 and further described in Schedule J, Table 1 of the current water license, laboratory analysis was carried out on a water sample collected at LUP-01. The results of the laboratory analysis are included in Appendix A. A summary of the analysis relevant to the parameters set out in the License are provided in Table 2.

Table 2 – Summary of Chemical Analyses Results – LUP 01- August 26, 2010	
Parameter	**Concentration**
Arsenic	<0.00040 mg/L
Cadmium	0.000055 mg/L
Copper	<0.0010 mg/L
Lead	<0.00010 mg/L
Zinc	<0.0020 mg/L
Mercury	<0.00010 mg/L
Total Faecal Colliform	<1 CFU/100ml
Conductivity	11.9 uS/cm
Total Suspended Solids	<3.0 mg/L
pH	6.74

B. TAILINGS EFFLUENT DISCHARGE: STATION LUP-10

There were no discharges from the Tailings Management Facility ponds at Station LUP-10 in 2010.

C. MINE WATER: STATION LUP-11

There was no mine water pumped from the workings at the Lupin Mine Site in 2010 while under care and maintenance.

D. SEWAGE EFFLUENT: STATION LUP-14

There were no discharges from the Sewage Lakes System at monitoring station LUP-14 in 2010.

E. DISCHARGE FROM BULK FUEL STORAGE BERM: STATION LUP–24.

A discharge of the water collected in the bulk fuel storage facility secondary containment area following the spring freshet was conducted on June 10, 2010. Table 3 provides as summary of the results of the chemical analysis of a sample collected prior to discharge. Full analytical certificates are provided in Appendix A.

Table 3 – Chemical Analytical Test Results
LUP-27, Bulk Fuel Storage Facility, Sampled June 10, 2010

Parameter	Maximum Average Concentration mg/L (Max. Conc. in Single Grab)	Sample Result mg/L
pH	6.0-9.0	6.81
Total Suspended Solids	15.0 (30.0)	<3.0
Total Oil and Grease	5.0 (10.0) mg/L	<1.0
Total Ammonia	2.0 (4.0)	<0.050
Total Lead	0.01 (0.02)	<0.0050
Benzene	0.37	<0.00050
Toluene	0.002	<0.00050
Ethyl Benzene	0.090	<0.0005

F. SURVEILLANCE NETWORK PROGRAM DATA

There were no discharges from the Tailings Management Facility at Station LUP-10; therefore there were no samples taken at the Surveillance Network monitoring sites in 2010 other than at LUP-01, Contwoyto Lake.

One set of thermistor data was taken from the Tailings Containment Area in 2010 during the geotechnical inspection. The results of these measurements are displayed graphically in TBT Engineering's annual inspection report, provided in Appendix C.

G. SUMMARY OF ACTIONS REGARDING INSPECTION AND COMPLIANCE REPORTS

This section provides a summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an inspector.

As there is currently only a seasonal presence on the site, typically between April and September, on site works will be completed as necessary and whenever possible during this annual field season timeframe. All inspection and compliance report requests will be attended to during the field season as they are presented to MMG.

There were no inspections by the INAC Water Inspector 2009 or 2010 and therefore no actions taken in response to orders.

H. WATER SUPPLY & WASTE DISPOSAL FACILITIES MAINTENANCE WORK

The maintenance and repair work that was conducted on these facilities was limited to the work recommended in the 2009 geotechnical inspection report.

I. LIST OF UNAUTHORIZED DISCHARGES

There were no unauthorized discharges during 2010.

J. REVISIONS TO PLANS, REPORTS AND MANUALS

J.1.1 Spill Contingency Plan

There were no updates to the Spill Contingency Plan for the 2010 operating season.

J.1.2 Abandonment, Reclamation and Closure Plan

There were no site activities that necessitated changes to the Abandonment and Restoration Plan in 2010.

J.1.3 Care and Maintenance Plan

In the October 7 2010 NWB letter, a request was made to provide Revised Laboratory QA/QC plan. This plan is provided in Appendix B. This was the only requested addition to the Care and Maintenance plan. The remainder of the plan was not revised for the 2010 season.

J.1.4 Tailings Cover Remediation

There were no abandonment and restoration activities performed on site in 2009.

K. PUBLIC CONSULTATION

There were no public consultation or community events/activities carried out in 2009.

L. ON SITE WORK COMPLETED IN 2010 AND PLANNED IN 2011

There was no Abandonment and/or Reclamation work carried out in 2009. The maintenance work recommended by the Geotechnical Engineer in the 2009 inspection report was undertaken in 2010. The TBT Engineering 2010 Geotechnical Inspection Report is included in Appendix C. An assessment of the state of completion of the 2009 recommendations and recommendations for 2011 are provided in the report. The recommendations from the 2010 Annual Inspection Report will be acted on in the 2011 field season.

M. CURRENT MINE RECLAMATION LIABILITY

An updated assessment of the present mine reclamation liability was completed and has been included in Appendix D. Consultation with the Statistics Canada Web site indicates that the 12 month increase in the consumer price index ending February 2011 was 2.2% with energy costs up 10%. The unit costs in the reclaim model were adjusted upwards by 3% for the large majority of the items in the model. Fuel was adjusted upwards by 10%. This is considered to be conservative because the majority of the inventory of fuel that would be required to complete the reclamation work is currently in inventory on the site and would be provided at no cost to the contractor. The revised reclamation cost liability according to the RECLAIM model is now $17,919,912, up $726,346 or 4% from the $17,193,566 figure reported in the 2009 Annual Report.

N. OTHER CONSIDERATIONS

No other considerations were identified at the time this report was prepared. Any future considerations will be communicated to the NWB as necessary.

Appendix A Certificates of Analyses

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Certificate of Analysis

MMG RESOURCES INC
ATTN: ANDREW MITCHELL
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8

Report Date: 03-SEP-10 15:50 (MT)
Version: FINAL

Lab Work Order #: **L925161** **Date Received:** **27-AUG-10**

Project P.O. #: 08-1310
Job Reference:
Legal Site Desc:
CofC Numbers: 08-011921

Other Information:

Comments:

Susan Clark
Account Manager

ALS Canada Ltd.
Part of the **ALS Laboratory Group**
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A Campbell Brothers Limited Company

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L925161-1 LUP-01							
Sampled By: CLIENT on 26-AUG-10 @ 08:30							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		01-SEP-10	R1456105
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.014		0.010	mg/L		02-SEP-10	R1456043
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		02-SEP-10	R1456043
Arsenic (As)-Total	<0.00040		0.00040	mg/L		02-SEP-10	R1456043
Barium (Ba)-Total	<0.0030		0.0030	mg/L		02-SEP-10	R1456043
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		02-SEP-10	R1456043
Boron (B)-Total	<0.050		0.050	mg/L		02-SEP-10	R1456043
Cadmium (Cd)-Total	0.000055		0.000050	mg/L		02-SEP-10	R1456043
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		02-SEP-10	R1456043
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		02-SEP-10	R1456043
Copper (Cu)-Total	<0.0010		0.0010	mg/L		02-SEP-10	R1456043
Lead (Pb)-Total	<0.00010		0.00010	mg/L		02-SEP-10	R1456043
Lithium (Li)-Total	<0.010		0.010	mg/L		02-SEP-10	R1456043
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		02-SEP-10	R1456043
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		02-SEP-10	R1456043
Selenium (Se)-Total	<0.00040		0.00040	mg/L		02-SEP-10	R1456043
Silver (Ag)-Total	<0.00010		0.00010	mg/L		02-SEP-10	R1456043
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		02-SEP-10	R1456043
Tin (Sn)-Total	<0.050		0.050	mg/L		02-SEP-10	R1456043
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		02-SEP-10	R1456043
Uranium (U)-Total	<0.00010		0.00010	mg/L		02-SEP-10	R1456043
Vanadium (V)-Total	<0.0010		0.0010	mg/L		02-SEP-10	R1456043
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		02-SEP-10	R1456043
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	0.94		0.50	mg/L		01-SEP-10	R1456199
Iron (Fe)-Total	<0.010		0.010	mg/L		01-SEP-10	R1456199
Magnesium (Mg)-Total	0.39		0.10	mg/L		01-SEP-10	R1456199
Manganese (Mn)-Total	0.0022		0.0020	mg/L		01-SEP-10	R1456199
Potassium (K)-Total	0.43		0.10	mg/L		01-SEP-10	R1456199
Sodium (Na)-Total	<1.0		1.0	mg/L		01-SEP-10	R1456199
Miscellaneous Parameters							
MF - Fecal Coliforms	See Attached					28-AUG-10	R1454553
Total Suspended Solids	<3.0		3.0	mg/L		30-AUG-10	R1453227
pH and Conductivity							
pH	6.74		0.10	pH		27-AUG-10	R1451425
Conductivity (EC)	11.9		0.20	uS/cm		27-AUG-10	R1451425

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
FCC-MF-PB	Water	Fecal Coliform Count-MF	APHA 9222D MF
HG-T-CVAA-ED	Water	Mercury (Hg) - Total	EPA 245.7 / EPA 245.1
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
PH/EC-ED	Water	pH and Conductivity	APHA 4500-H, 2510
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
PB	PBR LABORATORIES

Chain of Custody Numbers:

08-011921

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L925161 Report Date: 03-SEP-10

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8

Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-ED	**Water**							
Batch R1456105								
WG1160211-10 DUP		**L925602-12**						
Mercury (Hg)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
WG1160211-12 DUP		**L922362-3**						
Mercury (Hg)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
WG1160211-4 DUP		**L922022-1**						
Mercury (Hg)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
WG1160211-6 DUP		**L925161-1**						
Mercury (Hg)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
WG1160211-2 LCS								
Mercury (Hg)-Total			103		%		80-120	01-SEP-10
WG1160211-3 LCSD		**WG1160211-2**						
Mercury (Hg)-Total		103	106		%	2.2	20	01-SEP-10
WG1160211-1 MB								
Mercury (Hg)-Total			<0.00010		mg/L		0.0001	01-SEP-10
WG1160211-11 MS		**L925602-12**						
Mercury (Hg)-Total			101		%		70-130	01-SEP-10
WG1160211-13 MS		**L922362-3**						
Mercury (Hg)-Total			97		%		70-130	01-SEP-10
WG1160211-5 MS		**L922022-1**						
Mercury (Hg)-Total			114		%		70-130	01-SEP-10
WG1160211-7 MS		**L925161-1**						
Mercury (Hg)-Total			100		%		70-130	01-SEP-10
MET-T-L-ICP-ED	**Water**							
Batch R1456199								
WG1160032-2 DUP		**L925602-12**						
Calcium (Ca)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	01-SEP-10
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	01-SEP-10
Magnesium (Mg)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	01-SEP-10
Manganese (Mn)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	01-SEP-10
Potassium (K)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	01-SEP-10
Sodium (Na)-Total		<1.0	<1.0	RPD-NA	mg/L	N/A	20	01-SEP-10
WG1160032-1 MB								
Calcium (Ca)-Total			<0.50		mg/L		0.5	01-SEP-10
Iron (Fe)-Total			<0.010		mg/L		0.01	01-SEP-10
Magnesium (Mg)-Total			<0.10		mg/L		0.1	01-SEP-10
Manganese (Mn)-Total			<0.0020		mg/L		0.002	01-SEP-10
Potassium (K)-Total			0.11		mg/L		0.1	01-SEP-10

Quality Control Report

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8
Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-ICP-ED	**Water**							
Batch R1456199								
WG1160032-1 MB								
Sodium (Na)-Total			<1.0		mg/L		1	01-SEP-10
WG1160032-3 MS		**L925602-12**						
Calcium (Ca)-Total			107		%		70-130	01-SEP-10
Iron (Fe)-Total			99		%		70-130	01-SEP-10
Magnesium (Mg)-Total			111		%		70-130	01-SEP-10
Manganese (Mn)-Total			105		%		70-130	01-SEP-10
Potassium (K)-Total			103		%		70-130	01-SEP-10
Sodium (Na)-Total			104		%		70-130	01-SEP-10
MET-T-L-MS-ED	**Water**							
Batch R1456043								
WG1160032-2 DUP		**L925602-12**						
Aluminum (Al)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	01-SEP-10
Antimony (Sb)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	01-SEP-10
Arsenic (As)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	01-SEP-10
Barium (Ba)-Total		<0.0030	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-10
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	01-SEP-10
Boron (B)-Total		<0.050	<0.0040	RPD-NA	mg/L	N/A	20	01-SEP-10
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-SEP-10
Chromium (Cr)-Total		<0.0050	<0.00080	RPD-NA	mg/L	N/A	20	01-SEP-10
Cobalt (Co)-Total		<0.0020	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-10
Copper (Cu)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	01-SEP-10
Lead (Pb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
Lithium (Li)-Total		<0.010	<0.0060	RPD-NA	mg/L	N/A	20	01-SEP-10
Molybdenum (Mo)-Total		<0.0050	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
Nickel (Ni)-Total		<0.0020	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-10
Selenium (Se)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	01-SEP-10
Silver (Ag)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
Tin (Sn)-Total		<0.050	<0.00040	RPD-NA	mg/L	N/A	20	01-SEP-10
Titanium (Ti)-Total		<0.0010	<0.00060	RPD-NA	mg/L	N/A	20	01-SEP-10
Uranium (U)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-10
Vanadium (V)-Total		<0.0010	<0.00050	RPD-NA	mg/L	N/A	20	01-SEP-10
Zinc (Zn)-Total		<0.0040	<0.0040	RPD-NA	mg/L	N/A	20	01-SEP-10

Quality Control Report

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8
Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED	**Water**							
Batch R1456043								
WG1160032-1 MB								
Aluminum (Al)-Total			<0.010		mg/L		0.01	01-SEP-10
Antimony (Sb)-Total			<0.00040		mg/L		0.0004	01-SEP-10
Arsenic (As)-Total			<0.00040		mg/L		0.0004	01-SEP-10
Barium (Ba)-Total			<0.00020		mg/L		0.0002	01-SEP-10
Beryllium (Be)-Total			<0.0010		mg/L		0.001	01-SEP-10
Boron (B)-Total			<0.0040		mg/L		0.004	01-SEP-10
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	01-SEP-10
Chromium (Cr)-Total			<0.00080		mg/L		0.0008	01-SEP-10
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	01-SEP-10
Copper (Cu)-Total			<0.0010		mg/L		0.001	01-SEP-10
Lead (Pb)-Total			<0.00010		mg/L		0.0001	01-SEP-10
Lithium (Li)-Total			<0.0060		mg/L		0.006	01-SEP-10
Molybdenum (Mo)-Total			<0.00010		mg/L		0.0001	01-SEP-10
Nickel (Ni)-Total			<0.00020		mg/L		0.0002	01-SEP-10
Selenium (Se)-Total			<0.00040		mg/L		0.0004	01-SEP-10
Silver (Ag)-Total			<0.00010		mg/L		0.0001	01-SEP-10
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	01-SEP-10
Tin (Sn)-Total			<0.00040		mg/L		0.0004	01-SEP-10
Titanium (Ti)-Total			<0.00060		mg/L		0.0006	01-SEP-10
Uranium (U)-Total			<0.00010		mg/L		0.0001	01-SEP-10
Vanadium (V)-Total			<0.00050		mg/L		0.0005	01-SEP-10
Zinc (Zn)-Total			<0.0040		mg/L		0.004	01-SEP-10
WG1160032-3 MS		**L925602-12**						
Aluminum (Al)-Total			122		%		70-130	01-SEP-10
Antimony (Sb)-Total			104		%		70-130	01-SEP-10
Arsenic (As)-Total			115		%		70-130	01-SEP-10
Barium (Ba)-Total			122		%		70-130	01-SEP-10
Beryllium (Be)-Total			118		%		70-130	01-SEP-10
Boron (B)-Total			118		%		70-130	01-SEP-10
Cadmium (Cd)-Total			118		%		70-130	01-SEP-10
Chromium (Cr)-Total			116		%		70-130	01-SEP-10
Cobalt (Co)-Total			119		%		70-130	01-SEP-10
Copper (Cu)-Total			117		%		70-130	01-SEP-10
Lead (Pb)-Total			120		%		70-130	01-SEP-10

Quality Control Report

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8

Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-MS-ED	**Water**							
Batch R1456043								
WG1160032-3 MS		**L925602-12**						
Lithium (Li)-Total			123		%		70-130	01-SEP-10
Molybdenum (Mo)-Total			104		%		70-130	01-SEP-10
Nickel (Ni)-Total			118		%		70-130	01-SEP-10
Selenium (Se)-Total			117		%		70-130	01-SEP-10
Silver (Ag)-Total			104		%		70-130	01-SEP-10
Thallium (Tl)-Total			111		%		70-130	01-SEP-10
Tin (Sn)-Total			105		%		70-130	01-SEP-10
Titanium (Ti)-Total			106		%		70-130	01-SEP-10
Uranium (U)-Total			121		%		70-130	01-SEP-10
Vanadium (V)-Total			117		%		70-130	01-SEP-10
Zinc (Zn)-Total			115		%		70-130	01-SEP-10
PH/EC-ED	**Water**							
Batch R1451425								
WG1157178-2 LCS								
Conductivity (EC)			100		%		90-110	27-AUG-10
WG1157178-3 LCS								
pH			7.01		pH		6.9-7.1	27-AUG-10
WG1157178-5 LCS								
Conductivity (EC)			97		%		90-110	27-AUG-10
SOLIDS-TOTSUS-ED	**Water**							
Batch R1453227								
WG1158310-3 DUP		**L912809-12**						
Total Suspended Solids		19.0	16.0		mg/L	17	20	30-AUG-10
WG1158310-4 DUP		**L925161-1**						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	30-AUG-10
WG1158310-2 LCS								
Total Suspended Solids			92		%		85-115	30-AUG-10
WG1158310-1 MB								
Total Suspended Solids			<3.0		mg/L		3	30-AUG-10

Quality Control Report

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS 100831-01 (10-CAN)

CONFIDENTIAL ANALYSIS REPORT

REPORT #: 100831-01

WO #: 10-CAN

PO #: L925161

CLIENT: ALS Laboratory Group - Edmonton
9936-67 Avenue
Edmonton, AB
T6E 0P5

ATTENTION: ALSED Reporting
Tel: (780) 413-5227
Fax: (780) 437-2311

SAMPLE DESCRIPTION: Water Sample

DATE AND TIME OF SAMPLE COLLECTION: August 26, 2010

DATE AND TIME OF SAMPLE RECEIPT: August 27, 2010/14:10

SAMPLE TEMPERATURE WHEN RECEIVED: 8.9° Celsius

TEST PERFORMED: Fecal Coliform by MF

TEST START DATE: August 27, 2010

DATE COMPLETED: August 28, 2010

CERTIFICATE OF ANALYSIS: See Page 2

QUALITY CONTROL DATA: See Attached Appendix 1

Certificate of Analysis

PBR ID	Sample #	Client ID	Lot #	Test	Protocol	Quantity Analyzed	Result	Units	Comments
10-CAN-01	L925161-1	LUP-01		Fecal Coliform by MF	APHA-9222D	100 ml	<1	CFU/100ml	1

Comments

1 CFU = Colony Forming Unit.
<1 = No counts were detected based on the volume/dilution analyzed.

The reported results apply only to the items tested.

Parul Srivastava (Analyst)
Date: Aug 31 2010

Approved By: Narayan Pokharel, Ph.D.
Date: Aug 31 2010

PBR Laboratories Inc.

ALS 100831-01 (10-CAN)

APPENDIX 1

Quality Control Data for Fecal Coliform by MF (APHA-9222D)

Controls	Organism/Medium	Result
Sterility (media)	m-FC	Pass
Negative	Staphylococcus aureus	Pass
Positive	Escherichia coli	Pass

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # **08-011921**

Page ____ of ____

Report to:	**Report Format / Distribution**	**Service Requested:** (rush - subject to availability)
Company: MMG / Minerals + Metals Group	Standard: ____ Other: ____	Regular (Default)
Contact: Andrew Mitchell	Select: PDF ____ Excel ____ Digital ____	Priority (2-3 Business Days) - 50% Surcharge
Address:	Email 1: andrew.mitchell@mmg.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 807-251-6722 Fax:		
Invoice To: Same as Report ? Yes / No ?	**Client / Project Information:**	
Company:	Job #:	
Contact:	PO / AFE:	
Address:	Legal Site Description:	
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only): L925161	**ALS Contact:**	**Sampler:**

Analysis Request

(Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	Fecal Coliform		Total Metals		Ph		Conductivity		TSS				Number of Containers
	LUP-01	Aug 26/10	8:30am		X		X		X		X		X				
	RE: ALS Quotation Q21385																
	For Conway to Lake Annual																
	sample																

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF
			27-Aug-10	10:23	6.9			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Certificate of Analysis

MMG RESOURCES INC
ATTN: ANDREW MITCHELL
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8

Report Date: 18-JUN-10 11:56 (MT)
Version: FINAL

Lab Work Order #: **L896862** **Date Received:** **14-JUN-10**

Project P.O. #: 09-00623
Job Reference: LUPIN
Legal Site Desc:
CofC Numbers: 08-012380

Other Information:

Comments:

Maureen Olinek
Senior Account Manager

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L896862-1 LUP-27							
Sampled By: CLIENT on 10-JUN-10 @ 14:00							
Matrix: GRAB							
Hardness							
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	5.60		0.50	mg/L		17-JUN-10	R1278981
Magnesium (Mg)-Dissolved	0.73		0.10	mg/L		17-JUN-10	R1278981
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.0		1.3	mg/L		18-JUN-10	
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		14-JUN-10	R1275412
Ammonia-N	<0.050		0.050	mg/L		16-JUN-10	R1277465
Oil and Grease	<1.0		1.0	mg/L		15-JUN-10	R1276463
Lead (Pb)-Total	<0.0050		0.0050	mg/L		16-JUN-10	R1275664
Total Suspended Solids	<3.0		3.0	mg/L		14-JUN-10	R1275530
pH	6.81		0.10	pH		14-JUN-10	R1275412
BTEX and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L		16-JUN-10	R1276323
Toluene	<0.00050		0.00050	mg/L		16-JUN-10	R1276323
Ethylbenzene	<0.00050		0.00050	mg/L		16-JUN-10	R1276323
o-Xylene	<0.00050		0.00050	mg/L		16-JUN-10	R1276323
m+p-Xylene	<0.00050		0.00050	mg/L		16-JUN-10	R1276323
F1(C6-C10)	<0.10		0.10	mg/L		16-JUN-10	R1276323
F1-BTEX	<0.10		0.10	mg/L		16-JUN-10	R1276323
Xylenes	<0.0010		0.0010	mg/L		16-JUN-10	R1276323

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, Total	APHA 2320 B-Auto-Pot. Titration
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
MET-D-ICP-ED	Water	Dissolved Metals in Water by ICPOES	APHA 3120 B-ICP-OES
MET-T-MS-ED	Water	Total Metals in Water by ICPMS	SW 846 - 6020-ICPMS
NH4-ED	Water	Ammonia-N	APHA4500NH3F Colorimetry
OGG-ED	Water	Oil and Grease-Gravimetric	APHA 5520 G HEXANE MTBE EXT. GRAVIME
PH-ED	Water	pH	APHA 4500 H-Electrode
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA

Chain of Custody Numbers:

08-012380

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group Quality Control Report

Workorder: L896862 Report Date: 18-JUN-10

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8

Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TOT-ED	**Water**							
Batch R1275412								
WG1118483-4 LCS								
Alkalinity, Total (as CaCO3)			99		%		85-115	14-JUN-10
WG1118483-1 MB								
Alkalinity, Total (as CaCO3)			<5.0		mg/L		5	18-NOV-01
BTX,F1-ED	**Water**							
Batch R1276323								
WG1119625-2 LCS								
F1(C6-C10)			115		%		70-130	16-JUN-10
WG1119625-3 LCS								
Benzene			83		%		70-130	16-JUN-10
Toluene			85		%		70-130	16-JUN-10
Ethylbenzene			83		%		70-130	16-JUN-10
o-Xylene			87		%		70-130	16-JUN-10
m+p-Xylene			83		%		70-130	16-JUN-10
WG1119625-1 MB								
Benzene			<0.00050		mg/L		0.0005	16-JUN-10
Toluene			<0.00050		mg/L		0.0005	16-JUN-10
Ethylbenzene			<0.00050		mg/L		0.0005	16-JUN-10
o-Xylene			<0.00050		mg/L		0.0005	16-JUN-10
m+p-Xylene			<0.00050		mg/L		0.0005	16-JUN-10
F1(C6-C10)			<0.10		mg/L		0.1	16-JUN-10
MET-D-ICP-ED	**Water**							
Batch R1278981								
WG1120639-2 CRM		**EU-H-3_OPTWATER**						
Calcium (Ca)-Dissolved			104		%		80-120	17-JUN-10
Magnesium (Mg)-Dissolved			109		%		80-120	17-JUN-10
WG1120639-3 DUP		**L893980-1**						
Calcium (Ca)-Dissolved		57.8	57.5		mg/L	0.51	20	17-JUN-10
Magnesium (Mg)-Dissolved		34.0	33.3		mg/L	2.0	20	17-JUN-10
WG1120639-7 DUP		**L896920-10**						
Calcium (Ca)-Dissolved		0.62	0.62		mg/L	1.2	20	17-JUN-10
Magnesium (Mg)-Dissolved		0.30	0.32		mg/L	5.4	20	17-JUN-10
WG1120639-9 DUP		**L897482-1**						
Calcium (Ca)-Dissolved		29.0	29.3		mg/L	0.75	20	18-JUN-10
Magnesium (Mg)-Dissolved		1.25	1.22		mg/L	2.7	20	18-JUN-10
WG1120639-1 MB								

ALS Laboratory Group Quality Control Report

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8
Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-ICP-ED	**Water**							
Batch R1278981								
WG1120639-1 MB								
Calcium (Ca)-Dissolved			<0.50		mg/L		0.5	17-JUN-10
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	17-JUN-10
WG1120639-10 MS		**L897482-1**						
Calcium (Ca)-Dissolved			97		%		70-130	18-JUN-10
Magnesium (Mg)-Dissolved			101		%		70-130	18-JUN-10
WG1120639-4 MS		**L893980-1**						
Calcium (Ca)-Dissolved			103		%		70-130	17-JUN-10
Magnesium (Mg)-Dissolved			105		%		70-130	17-JUN-10
MET-T-MS-ED	**Water**							
Batch R1275664								
WG1119256-2 LCS								
Lead (Pb)-Total			99		%		80-120	15-JUN-10
WG1119256-8 LCS								
Lead (Pb)-Total			99		%		80-120	15-JUN-10
WG1119256-1 MB								
Lead (Pb)-Total			<0.0050		mg/L		0.005	15-JUN-10
WG1119256-7 MB								
Lead (Pb)-Total			<0.0050		mg/L		0.005	15-JUN-10
NH4-ED	**Water**							
Batch R1277465								
WG1119796-4 DUP		**L896920-5**						
Ammonia-N		<0.050	<0.050	RPD-NA	mg/L	N/A	10	16-JUN-10
WG1119796-6 DUP		**L897190-1**						
Ammonia-N		0.365	0.365		mg/L	0.19	10	16-JUN-10
WG1119796-8 DUP		**L897779-1**						
Ammonia-N		2.55	5.10		mg/L	3.0	10	16-JUN-10
WG1119796-2 LCS								
Ammonia-N			102		%		85-115	16-JUN-10
WG1119796-1 MB								
Ammonia-N			<0.050		mg/L		0.05	16-JUN-10
WG1119796-5 MS		**L896920-10**						
Ammonia-N			102		%		75-122	16-JUN-10
OGG-ED	**Water**							

ALS Laboratory Group Quality Control Report

Client: MMG RESOURCES INC
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8
Contact: ANDREW MITCHELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-ED	**Water**							
Batch R1276463								
WG1119347-2 LCS								
Oil and Grease			94		%		70-130	15-JUN-10
WG1119347-1 MB								
Oil and Grease			<1.0		mg/L		1	15-JUN-10
PH-ED	**Water**							
Batch R1275412								
WG1118483-3 LCS								
pH			7.02		pH		6.9-7.1	14-JUN-10
SOLIDS-TOTSUS-ED	**Water**							
Batch R1275530								
WG1118603-3 DUP		**L896181-4**						
Total Suspended Solids		6.0	4.0	J	mg/L	2.0	6	14-JUN-10
WG1118603-4 DUP		**L896400-1**						
Total Suspended Solids		5.0	4.0	J	mg/L	1.0	6	14-JUN-10
WG1118603-5 DUP		**L896395-5**						
Total Suspended Solids		1840	1770		mg/L	3.8	20	14-JUN-10
WG1118603-2 LCS								
Total Suspended Solids			102		%		85-115	14-JUN-10
WG1118603-1 MB								
Total Suspended Solids			<3.0		mg/L		3	14-JUN-10

ALS Laboratory Group Quality Control Report

Legend:

Limit	99% Confidence Interval (Laboratory Control Limits)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

ALS Laboratory Group Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	10-JUN-10 14:00	14-JUN-10 19:23	0.25	101	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L896862 were received on 14-JUN-10 09:12.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 08-012380

Page 1 of 1

Report to: MMG Resources	**Report Format / Distribution**	**Service Requested:** (rush - subject to availability)
Company: ANDREW Mitchell.	Standard: ___ Other: ___	Regular (Default)
Contact:	Select: PDF ___ Excel ___ Digital ✓	Priority (2-3 Business Days) - 50% Surcha[redacted]
Address:	Email 1:	Emergency (1 Business Day) - 100% Surcha[redacted]
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Conta[redacted]
Phone: Fax:		**Analysis Request**
Invoice To: Same as Report ? Yes / No ?	**Client / Project Information:**	(Indicate Filtered or Preserved, F/P)
Company:	Job #: LUPIN.	
Contact:	PO / AFE:	
Address:	Legal Site Description:	
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only) [redacted]	**ALS Contact:**	**Sampler:**

Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	PH	TSS	Oil & Grease	Ammonia	Metals ICP	Alkalinity	Hardness	BTEX.	Number of Containers
1	LUP-27PERG21399.	JUN 10/10	14:00	GRAB	✓	✓	✓	✓	✓	✓	✓	✓	

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE / INSTALLATION / RECEPTION

Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF
		[redacted]	14 Jun 10	9:12	5.6			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Appendix B Laboratory QA/QC Plan

Canada - Lupin Mine Water Sampling Quality Assurance Plan

March 31, 2011

Submitted under:

Water Licence NWB1LUP0914
Nunavut Water Board

DOCUMENT CONTROL

Revision No	Date	Details	Author	Approver
1.0	15/6/09		A Mitchell	
1.1	25/2/10	Reformatted to MMG standard		
1.2	31/03/11	Updated for 2010 NWB Annual Report	A. Mitchell	A. Mitchell

TABLE OF CONTENTS

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1 GENERAL

1.1 PURPOSE

This water sampling Quality Assurance/Quality Control plan has been developed to supplement detailed sampling plans and to function in conjunction with industry standards for the sampling and testing of water samples for environmental monitoring purposes.

1.2 DISTRIBUTION LIST

Affiliation	Position	Name	Copy #
MMG Canada	President	Martin McFarlane	
MMG Canada	Development Manager	Andrew Mitchell	
MMG Canada	Exploration Manager	Ian Neill	
MMG Canada	Project Manager- High Lake	Jason Rickard	
MMG Canada	Project Manager – Izok Lake	Ron Fenlon	

Additional copies of the Plan may be obtained by contacting the Development Manager, at the address above.

1.3 MMG CORPORATE ENVIRONMENTAL POLICY

Our aim is to achieve a high standard of care for the natural environment in all of the activities in which we engage. We undertake to minimise our impact on the environment.

We will:

- Conduct our operations in compliance with all relevant environmental regulations, licenses and legislation as a minimum condition;
- identify, monitor and manage environmental risks arising from our operations;
- seek continuous improvement in environmental performance, production processes, waste management and the use of resources;
- provide appropriate training and awareness for all employees on environmental issues;
- communicate regularly with employees about our aim and about individual responsibilities;
- inform our customers and suppliers of our aim and of their responsibilities in relation to our business;
- communicate with shareholders, the community and governments about our environmental performance, and contribute to the development of laws and regulations which may affect our business.

2 SAMPLING QA/QC PROCEDURES

2.1 PREPARATION FOR FIELD SAMPLING

- For the desired analytical parameter, obtain the appropriate sample container size and type from the laboratory, as well as any required preservative. Use clean, new containers only. Confirm specific sample handling techniques and maximum storage time for the laboratory. A separate container is not necessarily required for each parameter required. Obtain a general summary of containers, preservation and storage time for required parameters from the lab.
- Set aside a field book to take notes during the collection of surface water samples and field readings. The field book should contain all information, and will provide a record of all activities and field conditions during the sample collection. The following list describes the mandatory entries, but it by no means exclusive
    - Date
    - Weather
    - Personnel
    - Time – the time that work starts and stops each day
    - Scope – the scope and goal for each day's work or work task should be briefly entered
    - Comments – it is useful to make brief entries regarding the samplers thoughts and reasons for changes in the expected scope of work
    - Sampling information – the following needs to be recorded for each sample collected
        - Sample identification
        - Water observations
        - Sample depth in meters
        - The results of field readings
        - Whether the sample will be submitted for analysis and type of analysis
        - Anything else relevant

2.2 SAMPLE COLLECTION

The following procedures are to be followed to ensure the collection of representative, cross-contamination free water samples.

- If collecting a series of samples from water within a current, it is important to start down-current and work up-current (to prevent cross-contamination).
- Wear nitrile gloves and use sterile equipment.
- For all parameters, fill the sample container complete. If filtration is required, filter the sample directly into the sample container, prior to the addition of preservation.
- If preservation is required, it should be added to the sample immediately after collection and filtration.
- Label the sample container properly with the sample ID, sample collection date, company name, project number, preservation method and requested analysis.
- Place the sample in a cooler chilled with freezer pack or ice for transport to the laboratory.
- Complete sample submission and chain-of-custody (COC) forms. COC forms need to be filed out entirely and each cooler shipped should have its own COC form listing only those samples

contained in the particular cooler. COC forms should be enclosed in a Ziploc bag to protect them from possible water damage during shipment.

2.3 FIELD QA/QC

The following procedures are to be implemented with respect to field sample collection quality assurance/quality control parameters:

- Surface water samples are to be collected and handled according to approved sampling protocols
- Field notes must be documented carefully
- The proper sample containers, preservation, holding times are to be understood and followed. Samples are to be carefully labelled and documented. Sample identification should be double checked
- Field measurements are to be completed with equipment that is calibrated daily (for the Lupin SNP sampling locations pH, temperature and specific conductivity shall be recorded at the time of sampling). The calibration records must be completed properly with the date, time and personnel.
- Blind field duplicate water samples are labelled, collected and handled as regular samples. The samples are submitted to the laboratory with a unique identifier to prevent association of the paired samples. Collect field replicates as close as possible in time with the paired sample
- Blind field duplicate water samples are to be collected for every 7 samples.
- Field blanks are collected in the field using the same lot of sample containers for each blank as for the samples. However, fill the sample container with de-ionized water rather than sample water.
- Collect field blank samples using the same equipment and methods as used to collect samples. Attempt to simulate actual field sampling methods that would detect the presence of background or cross-contamination of samples from the ambient environment, preservatives or sampling equipment. Attempt to have the blank water contact all the interfaces that the sample water will contact.

2.4 LABORATORY QA/QC

The analytical laboratory will instigate its own detailed QA/QC plan relevant to the analyses and matrix of sample being treated. The following procedure will be implemented with respect to MMG's review and interpretation of the data.

- Samples and field blanks will be analysed in accordance with methods prescribed in the current edition of "Standard Methods for the Examination of Water and Wastewater"*.
- When the analytical results are received, the data needs to be reviewed to ensure the correct requested analysis was completed, and that the analysis was completed within the required holding time.
- The results should also be examined for inconsistencies and/or potentially anomalous results. This should be done as soon as the results are received so the problems, if any, can be resolved prior to the final laboratory report being issued.

Appendix C 2010 Geotechnical Inspection Report

2010 Annual Geotechnical Inspection
Perimeter Dams Tailings
Containment Area
Lupin Mine, Nunavut

Prepared For:

MMG Resources Inc.

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Prepared By:

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November 3, 2010

Ref. No. 10-069

TBT ENGINEERING
CONSULTING GROUP

November 3, 2010
TBTE Ref. No. 10-069

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Development Manager - Canadian Operations
MMG Resources Inc.
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Thunder Bay, Ontario, P7B 6M8

Re: 2010 Annual Geotechnical Inspection
Perimeter Dams Tailings Containment Area
Lupin Mine, Nunavut

Introduction

As a part of the requirements for the Water Licence 2AM-LUP0914, Annual Geotechnical Inspections are to be undertaken for the perimeter dams of the Tailings Containment Area (TCA) at the Lupin Mine project. These inspections were undertaken by TBT Engineering Limited on August 24 and 25th, 2010. This report provides a summary of these inspections and documents the findings. Recommendations for upgrading and future investigations have been provided where appropriate.

The Lupin Mine is located 285 km southeast of Kugluktuk, Nunavut and 400 km north-northeast of Yellowknife, Northwest Territories on the south shore of Contwoyto Lake. Access to the mine in the summer months is by air only. Mine locations and layout have been illustrated on Enclosures 1-2.

The mine operates under Nunavut Water Board Licence 2AM-LUP0914 which was transferred from a previous owner to Lupin Mines Inc., a subsidiary of Wolfden Resources. Ownership of Wolfden was acquired by Zinifex Limited of Melbourne, Australia in 2007. In 2008, Zinifex merged with Oxiana Ltd. of Australia to form OZ Minerals Ltd. In 2009, the Canadian assets of OZ Minerals were sold to China Minmetals Ltd. The Canadian operating company set up after that transaction is MMG Resources Inc., which is a wholly owned subsidiary of Minerals and Metals Group Ltd. of Melbourne Australia. The mine continues to be held by the corporation Lupin Mines Inc., which is a wholly owned subsidiary of MMG Resources Inc.

The mine discontinued production in 2005 and is currently operated on care and maintenance status. There has been no tailings deposition since 2005.

The relevant conditions of the Nunavut Water Licence which apply to the annual inspection are:

- A freeboard limit of 1.0 m at Dam 1A should be maintained at all times
- Seepage from the TCA is to minimized
- Any seepage that occurs should be collected and returned to the TCA immediately
- Any erosion of the facilities should be addressed immediately
- Inspection of the dams and related infrastructure should be carried out weekly; and
- The Annual Inspection report should be forwarded to the Water Board within 60 days of the inspection date.

The 2010 inspection was undertaken following the authorization of Andrew Mitchell of MMG. The inspection was carried out by Gordon Maki, P.Eng. and Ernie Krause, Sr. Technologist of TBT Engineering. Conditions and any points of concern were discussed with Andrew Mitchell via teleconference.

Dam Inspection /Review History

Previous dam design, construction inspection and annual inspection reports should be reviewed for data regarding the design and history of prior recommendations for the dams. The following reports may be referenced:

Geocon (1982)	As built information regarding Dam 1A, 1B, 1C, 2 and 4A (later 4) Dams constructed to elev. 485 during 1981 Dams constructed of silty sand till with an upstream synthetic liner keyed to permafrost
Golder (1992)	Design information regarding Dams 4, 5, 6. Dams constructed of silty sand till with upstream liner keyed to permafrost Dam 4 liner extends 15 m upstream from toe. Dam 4 has a downstream rockfill toe drain All liners reported to extend to 0.5 below crest
Golder (2004)	Dam Safety Review Dam Failure Consequence reported to be Very Low for Dams 1A, 2 and 4 Failure Consequence reported to be Low for Dams 1B, 1C, 3, 5, and 6 Slope Stability analysis was carried out by Golder for Dams 1A, 2 and 4. Minimum Factory of Safety 1.6 for static conditions Minimum Factory of Safety 1.3 for seismic conditions An Operations, Maintenance and Surveillance Manual was included
BGC (2007)	2007 Annual Geotechnical Inspection of Perimeter Dams Perimeter embankments found to be in satisfactory condition Minor erosion gullies to be repaired No evidence of permafrost warming in available instrumentation Thermistor and pond level monitoring program suggested
BGC (2008)	2008 Annual Geotechnical Inspection of Perimeter Dams Perimeter embankment crests found to be in good condition Trend for increasing erosion noted. Erosion gullies to be repaired Thermistor and pond level monitoring program suggested Application to Water Board for revised monitoring program suggested
TBT Eng. (2009)	2009 Annual Geotechnical Inspection of Perimeter Dams Recommendation to address toe seepage at Dam 4. Recommendation to flatten slope of toe berm at Dam 1A. Recommendation to investigate minor cracking near downstream toe. Recommendation to infill small pond upstream of Dam 6. Placement of Riprap upstream of Dam 2 to be completed. Improve upstream ditch and storm gully at Dam 3. Minor erosion noted.

Tailings Containment Area

The tailings dams at the Lupin site consist of earth fill dams which rely on ground freezing (permafrost aggradation) to reduce seepage. A secondary liner was keyed into the underlying permafrost during construction. A system of thermistors has been installed in the dams to monitor the temperatures in the dam cores.

The Tailings Containment Area (TCA) uses several low dams to contain the tailings solids. The five cells at the site (illustrated on Figure 2) provide storage for historically deposited tailings and process water as well as accumulations of runoff water. Discharge to the environment from Pond 2 normally occurs every 1 or 2 years.

Prior to discharge, the quality of water is verified and the water treated if required, typically through the addition of lime to increase the pH. Discharge is through the siphons at Dam 2. When water levels in Pond 2 allow, water is transferred from Pond 1 using siphons at J Dam.

Tailings production and deposition ceased in 2005. The mine is currently closed and mine site activities are limited to maintenance of the water levels in the TCA.

Climatic Conditions

Climatic conditions at the site were recorded at the Lupin weather site until 2006. Since then, an automated system has been present at the site. However the nearest site with available climatic data is now located at Kugluktuk, approximately 250 km northwest. The historic Mean Average Annual Temperature (MAAT) at the site is reported to be -11.0 ℃, with a long term MAAT of -10.6℃ at Kugluktuk. The measured MAAT (Kugluktuk) for 2008 was -10.8 ℃ during 2008 which is consistent with long term averages.

Site Inspections

The perimeter dams at the Lupin Mine were inspected by TBT Engineering on August 24 and 25, 2010. The inspections were completed by Gordon Maki, P.Eng. and Ernie Krause, Sr. Technologist from TBT Engineering. Each of the embankments was visually reviewed, photographed and a standardized site inspection form was completed. Areas of concern were discussed with the MMG representative via telephone.

A number of thermistor string readings located along the various perimeter structures were taken by TBT Engineering during the inspection trip. The calibrated results of these readings have provided and have been attached in Appendix B. It should be noted that not all of the perimeter structures have thermistor strings, or where there are thermistor strings, some of the data could not be obtained due to improper connections to the cables, or damaged cables. At some locations, one or more of the thermistors within the string were not operational.

Findings and Conclusions

Details of the various site inspections have been documented on the attached individual site reports (Appendix A). These have been updated in a standardized format to be consistent with previous Annual Inspections.

A review of the thermistor data available indicates the dams continue to maintain frozen conditions below the active zone, located approximately 2 m below grade. Many of the thermistor strings are now damaged and/or not readable. It is recommended that the thermistor monitoiring program be reviewed and updated. Damaged thermistors should be replaced and additional thermistor strings may be warranted.

Except as noted blow, the inspections confirm the dams are generally in satisfactory condition. However, in general, erosion of the downstream slopes has worsened over the last year (possibly due to a heavy precipitation event). Downstream erosion conditions at each of the structures inspected is summarized as follows:

- Dam 1A: Widspread shallow erosion gullies and cracking near downstream crest
- Dam 1B: Minor runoff erosion rills and a few deeper erosion gullies, no cracking.
- Dam 1C: Minor erosion gullies with two cracks noted along downstream slope.
- Dam 2: Extensive erosion gullies, appears to be more extensive than last year.
- Dam 3: Minor erosion rills and sloughing.
- Dam 4: Extensive and deep erosion gullies (3 of which are upto 1 m deep).
- Dam 5: Two small surface cracks and a few small 150 mm deep erosion gullies.
- Dam 6: Extensive erosion gullies (up to 0.5 m deep).

A maintenance program to address and repair downstream erosion along all of the perimeters dams should be implemented to prevent further and eventually destabilizing erosion of the downstream slopes. A design of the erosion measures should be carried out and should consider various options to improve the erodability of the downstream slopes.
Additional recommendations for the various structures other than downstream erosion maintenance are as follows:

Dam 2:

One small area of light seepage was noted along the downstream toe. At the time of this inspection, the seepage water was free of sediment and piping conditions were not evident. It is possible the seepage conditions may become worse over time and with an increase in level of Pond 2. It is possible that some of the water ponding on the downstream side of the dam

originates from seepage through the dam and/or under the dam, through the foundation soils. Seepage may also be related to recent precipitation that may have infiltrated the downstream portion of the dam. A sample of the seepage water should be collected to assess if the source can be Pond 2.

The geotechnical conditions at Dam 2 should be investigated to determine the in situ fill conditions and to measure pore water levels in the dam. In addition, an additional thermistor string may be considered at the seepage location to review the depth of frozen ground. Once conditions at the site are determined, remediation of the downstream slope should be undertaken. Remediation options may involve construction of suitable granular filter zones and / or construction of a suitable impermeable barrier to significantly reduce seepage losses. Widening of the base of the dam to attract the aggradation of permafrost conditions into the deep foundation of the dam may also be considered as a design alternative.

The investigation and design and approvals work should be undertaken in 2011. With suitable monitoring and some temporary remediation efforts, construction of the slope improvements may be scheduled for 2012. In the interim, the water ponded downstream of the dam should be sampled to ensure environmental compliance and may require containment and pump back over the dam. The water level in Pond 2, should be lowered as much as possible to reduce seepage gradients until such time as the seepage conditions are understood and/or corrective measures can be implemented. The seepage conditions at Dam 2 should be monitored and the mine should be prepared to implement immediate temporary repair to the dam should conditions deteriorate.

Dam 3:

Recent upgrades included relocation and construction of the existing upstream ditch spillway across the dam. In addition, the upstream ditch was extended to the new spillway location. Although the new spillway has significantly more capacity than the original, the new spillway was not constructed in strict accordance with the geometry recommended and may have slightly reduced flow capacity. It also appears the upstream ditch extension included the placement of riprap along the invert without the use of geotextile. The newly constructed ditch alignment and the new spillway should be monitored / inspected for signs of erosion and/or insufficient capacity. In addition, the existing upstream ditch (located south of the newly constructed portion) should be cleaned out.

In addition to the above upgrades, it appears that the crest of the dam was also resurfaced with new esker fill. However, it appears that this was placed without compaction. Compaction should be considered to improve erodabilty of the crest surface.

Dam 4:

Measures to address a seepage issues noted last year along Dam 4 (in the area of the downstream coffer dam) have been carried out. This involved in filling the area between the downstream toe and coffer dam, thus flattening the downstream slope. However, the fill material appears to have been placed in a loose manner. As a minimum, surface compaction of the newly placed fill should be considered to improve erodabilty of the new fill surface.

Frequency of Inspections

Clause D.6.f of the Water License (Clause D.6.f) requires weekly inspections of tailings dams, ponds (and associated infrastructure) be undertaken by site staff and records kept on these inspections. This is impractical given the closed condition of the site. However, there are currently seepage issues at Dam 2, it should monitored regularly until such time as the issue is resolved.

A revised inspection schedule should be considered once seepage at Dam 2 has been remediated, with an appropriate amendment to the Water Licence. In addition, revisions to the thermistor reading schedule are appropriate. A suggested schedule was provided in previous Annual Inspection Reports as follows:

- November to April – monthly would be helpful but not critical
- May to June – weekly
- July to October – every two weeks.

The monitoring data is to provide proactive assessment of potentially deteriorating performance of the dams. Instrumentation and monitoring data from the various dams should be reviewed immediately after collection.

Closure

We trust the above addresses your requirements at this time. We enjoyed working with you on this project. Please contact us at your convenience should you have any questions.

Yours truly,
For TBT Engineering

REGISTERED PROFESSIONAL ENGINEER
G.C. MAKI
LICENSEE
NWT/NU

Gordon Maki, P. Eng.
Manager of Geotechnical Engineering

Wayne Hurley
Principal

PERMIT TO PRACTICE
TBT ENGINEERING LIMITED
Signature
Date Nov 3/10
PERMIT NUMBER: P561
NWT/NU Association of Professional Engineers and Geoscientists

APPENDIX “A”

2010 GEOTECHNICAL INSPECTION
PERIMETER TAILINGS DAMS

DAM 1A

LOCATION:	West side of Pond 2.
FUNCTION:	Major perimeter closure for water retention; siphon pipes for water decant system on the crest of the dam. Pond level presently being lowered using siphons
LENGTH:	250 +/- m
MAX HEIGHT:	8 m +/- above d/s tundra.
AS-BUILT CREST ELEVATION:	486.27 m
CURRENT CREST ELEVATION:	486.1 – 486.4 m
POND ELEV.:	481.8 m
FREEBOARD :	4.3 m
CREST WIDTH AND CONDITION:	7 to 8 m; surfaced with esker material, but not traveled because of the siphons. No significant cracking evident; condition remains good.
RIPRAP:	Run of Mine rockfill; broadly graded; good condition.
BACKSLOPE:	Approx. 1.5H; 1V; variably armored with cobbles and boulders. Of the 5 siphon pipes in place last year, only 2 remain in service. The most northerly 3 siphon pipes have been completely removed while the 2 most southerly siphon piles have been left in-place below the access road. In the area of the two remaining siphon pipes, the pipe supports along the stream slope have been removed and the slope flattened with granular fill to support the siphon pipes. This slope flattening was carried out over a length of approximately 26 m. Slope flattening was not carried out in the area of the three abandoned siphon pipes. Two ,1 m long cracks noted near the downstream crest, likely due to shallow sloughing as a result of the formation of widespread shallow erosion gullies along downstream slope. Erosion is most predominant south of the remaining 2 siphon pipes.
ACCESS ROAD TOE BERM	As per recommendations made last year, the downstream slope of the access road toe berm was regraded and provided with riprap over a 48 m long section. The downstream slope of the access road toe berm is approximately 2.5H:1V

SEEPAGE: No evidence of seepage.

INSTRUMENTATION: Thermistor D1A-00-1 is located in the crest, just south of the mid-point of the dam. However, this thermistor was not operational.

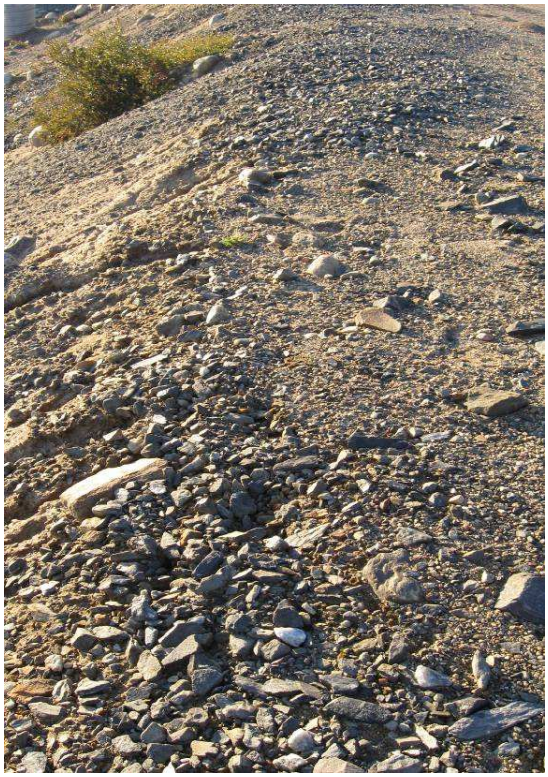
MAINTENANCE RECOMMENDATIONS: Maintenance is recommended to repair erosion along areas of the downstream slope.

CONCLUSIONS: The dam is appears to be in a stable condition. Maintenance of downstream erosion is recommended.

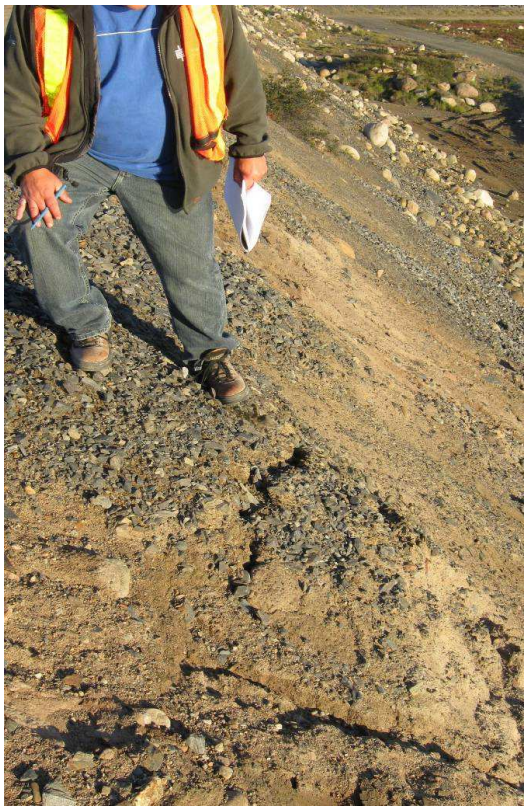
Dam 1A Overview

Dam 1A: Downstream – Looking South (north side of siphons)

Dam 1A – Downstream Slope (south side of Siphons) Erosion Gullies



Downstream Crest: 1 m long narrow crack



Downstream Crest: 1 m long narrow crack

Dam 1A: Downstream Access Road toe Berm Looking South (Note, Downstream Slope Regraded and Covered with Riprap in 2010).

Dam 1A: Downstream Access Road toe Berm Looking North (Note, Downstream Slope Regraded and Covered with Riprap in 2010).

Dam 1A: Upstream Looking North

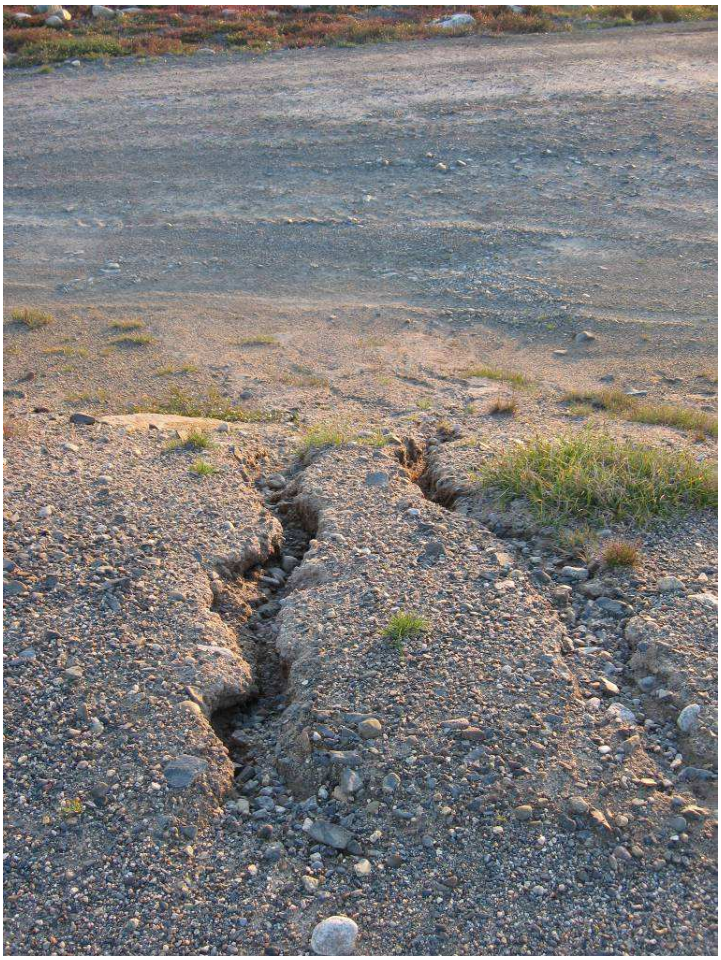
Dam 1A: Upstream Looking South

DAM 1B

LOCATION:	West side of Pond 2.
FUNCTION:	Major perimeter closure for water retention; pond level is below dam base elevation thus currently functioning only as a road embankment.
LENGTH:	250 +/- m
MAX HEIGHT:	2.5 +/- m above d/s tundra.
AS-BUILT CREST ELEVATION:	485.83 m
CURRENT CREST ELEVATION:	485.4 – 485.6 m
POND ELEV.:	481.8 m
FREEBOARD :	3.6 m
CREST WIDTH AND CONDITION:	5 to 6 m wide; surfaced with esker material. Downstream berm provides roadway for access around the perimeter of the TCA.
Crest condition is good.	
RIPRAP:	Run of Mine rockfill; variable sizes in good condition overall.
BACKSLOPE:	Approx. 1.5H; 1V with minor runoff erosion rills and gullies and a
toe-of-	slope roadway berm. No cracking observed..
SEEPAGE:	No seepage observed
INSTRUMENTATION:	None.
MAINTENANCE RECOMMENDATIONS:	Maintenance of downstream surface erosion should be considered.
CONCLUSIONS:	The dam appears to be in a stable condition. Maintenance of downstream erosion is recommended.

Dam 1B: Upstream

Dam 1B: Downstream



Dwonstream Slope: Erosion Gullies

DAM 1C

LOCATION:	West side of Pond 2.
FUNCTION:	Major perimeter closure for water retention
LENGTH:	230 +/- m
MAX HEIGHT:	2.2 +/- m above d/s tundra.
AS-BUILT CREST ELEVATION:	485.88 m
CURRENT CREST ELEVATION:	485.3 m
POND ELEV.:	481.8 m
FREEBOARD :	3.5 m
CREST WIDTH AND CONDITION:	9 +/- wide; surfaced with esker material, this dam also functions as a roadway, Crest condition is good. Animals are starting to burrow into the dam body.
RIPRAP:	Run of Mine rockfill; Southerly 2/3 of dam length has been regraded/extended with rip rap and esker material. Minor erosion gullies noted along upstream side near the crest/shoulder (above rip rap).
BACKSLOPE:	Approx. 3H; 1V, smooth slope. Access road berm appears in good condition. Two cracks (one 7 m long and one 12 m long) were observed along the downstream slope. The cracks were 75 to 150 mm deep. Surface sloughing along the downstream slope is visible.
SEEPAGE:	No seepage observed.
INSTRUMENTATION:	None
MAINTENANCE RECOMMENDATIONS:	Maintenance of cracking/sloughing conditions along downstream slope is recommended.
CONCLUSIONS:	The dam appears to be in a stable condition. Maintenance of downstream erosion and sloughing is recommended.

Dam 1C: Upstream (Minor Erosion Gullies on Shoulder of Granular Surfacing)

Dam 1C: Upstream (Minor Erosion Gullies on Shoulder of Granular Surfacing) Souther 2/3 of Upstream Slope Has Been Regraded/Extended with a Mixture of Rip Rap and Esker Material

Dam 1C: Downstream Slope (Some Minor Erosion Gullies)

Dam 1C: Downstream Slope (Some Minor Erosion Gullies)

Downstream Slope (7 m long crack, 75 mm deep, north end of dam)

Downstream Slope (12 m long crack, middle of dam, 150 mm deep)

DAM 2

LOCATION:	North end of Pond 2.
FUNCTION:	Major perimeter closure for water retention; natural pond downstream of the dam.
LENGTH:	350 +/- m
MAX HEIGHT:	5.5 +/- m above d/s tundra.
AS-BUILT CREST ELEVATION:	486.30 m
CURRENT CREST ELEVATION:	485.6 – 486.0 m
POND ELEV.:	481.8 m
FREEBOARD :	3.8m
CREST WIDTH AND CONDITION:	Approx. 6 m; surfaced with esker material and used as the primary traffic route for TCA. Crest relatively uniform and level.
RIPRAP:	Upstream slope as been regraded (flattened) to approximately 4.5H:1V above el. 483 m and 1.5H:1V below el. 483 to the pond level. Regraded with a mixture of riprap and esker material.
BACKSLOPE:	Variable materials but comprised mostly of esker granular material. Erosion gullies and rills appear to be more extensive than last year.
SEEPAGE:	Seepage was observed at one location along the downstream toe (located approximately 20 m south of thermistor D2-00-02). Seepage was estimated at a rate of 2 litres/min. Seepage appeared to be free of any sediment.
INSTRUMENTATION:	Thermistor D2-00-02 is located at the north end of the crest. Several of the thermal couples are not operational. Thermistor D2-00-03 has a broken cable.
MAINTENANCE RECOMMENDATIONS:	Erosion rills and gullies along downstream slope are more extensive than last year. Maintenance of erosion is recommended. One small area of light seepage was observed along the downstream toe. Currently, the seepage rate does not appear to be causing internal erosion. The seepage may be a result of thawing conditions near the northeast abutment, or from recent precipitation events. A sample of the seepage may be collected to possibly determine if seepage is from Pond 2. This

area should be monitored to identify if seepage stops, or for signs of erosion. Should seepage continue and/or worsen, additional investigation and/or remedial measures should be considered.

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CONCLUSIONS:

The dam currently appears to be in a stable condition. However, should seepage conditions continue and/or worsen, stability could be compromised. Further inspection and/or investigation with possible remediation may be required. In addition, the extensive downstream erosion should be repaired. Current seepage conditions should be monitored and investigated further or repaired if seepage continues are worsens.

Dam 2: Upstream Slope Looking Northeast, Regraded with Riprap and Esker Material (graded at approx. 4.5H:1V upper portion, and at 1.5H:1V below about el. 483 m to pond level).

Dam 2: Upstream Looking Southwest

Dam 2: Downstream Slope

Dam 2: Downstream Slope Erosion Gullies and Rills

Dam 2: Downstream Toe (approx. 20 m South of D2-00-02) Clear Seepage at a Rate of Approx. 2 liters/min.

DAM 3

LOCATION:	East end of now-covered tailings storage area, east of Cells 1 and 2.
FUNCTION:	Minor perimeter closure for tailings retention; Boomerange Lake downstream of the dam. The dam retains tailings covered with an esker material cap
LENGTH:	600 +/- m
MAX HEIGHT:	2.5 +/- m above d/s tundra.
AS-BUILT CREST ELEVATION:	488.4 m
CREST WIDTH AND CONDITION:	Approx. 8 m; surfaced with esker material. In 2010, a new upstream ditch outlet spillway was constructed across the dam to replace the existing spillway which did not appear to have sufficient capacity. While the new spillway has a significant increase in capacity over the original spillway, the new spillway was constructed smaller than specified and as such may have less capacity than designed for. In addition, a portion of the upstream ditch has been reconstructed between the old and new spillway locations has been lined with riprap (without geotextile) over a length of approx. 100 m. The existing ditch upstream of the reconstructed section has experienced some erosion and deposition of sediment. Between the old and new spillway locations, the crest of the dam has been recovered with esker material in a loose condition.
RIPRAP:	Not applicable: Inside slope buried with cover comprised of esker sand and gravel.
BACKSLOPE:	Variable in inclination; locally meets the shoreline of Boomerang Lake. Some minor erosion rills and sloughing were noted.
SEEPAGE:	None observed.
MAINTENANCE RECOMMENDATIONS:	The loosely placed esker material along the crest should be compacted to improve resistance to erosion. The existing ditch southeast of the regraded section should be cleaned out to remove accumulated material. The newly regarded portion of the upstream ditch should be inspected for future signs of erosion. The new spillway performance should be monitored for signs of erosion and/or inadequate capacity.
CONCLUSIONS:	The dam appears to be in a stable condition. Maintenance and inspection as recommended above should be carried out.

Dam 3: Overview

Dam 3: Upstream slope looking northwest at area of recent ditch regrading leading to reconstructed spillway. Ditch invert graded at about 3.5%. Tailings side ditch slope at about 4H:1, lake side ditch slope at about 3H:1V. Ditch invert lined with riprap (no geotextile observed).

DAM 3: Usptream crest looking southeast. Loose fill on crest. End of ditch regrading. Ditching upstream of ditch regrading treatment contains some sediment.

Dam 3: Spillway crossing dam at end of upstream ditch. Recently re-constructed with a grade of about 20H:1V (was specified at 30H:1V through the dam and 7H:1V along downstream slope). Through the dam crest, the new spillway has a channel base width of 2 m, not the specified 4 m. The spillway is lined with riprap and geotextile.

Dam 3: Downstream side of spillway (splash pad). Spillway side slope constructed at about 2.5H:1V (steeper than 3H:1V specified). Slopes on the outside of the spillway channel are also steeper than specified.

DAM 4

LOCATION:	South end of Cell 4 for K Dam sub-pond.
FUNCTION:	Perimeter closure for water retention at present; natural pond downstream of the dam at its west end.
LENGTH:	900 +/- m
MAX HEIGHT:	6 +/- m above u/s native ground elevation.
AS-BUILT CREST ELEVATION:	489.59 m
CURRENT CREST ELEVATION:	489.2 – 489.5 m
POND ELEV.:	484.8 m
FREEBOARD :	4.4 m
CREST WIDTH AND CONDITION:	Approximately 12 m wide crest width in generally good condition.
RIPRAP:	Run of Mine rockfill in generally good condition on upstream slope. Occasional small void in riprap and minor sloughing at some locations.
BACKSLOPE:	Esker sand. At the west end of the dam, the area between the dam and the old cofferdam has been infilled (treating oversteeped slope and seepage zone observed last year). The esker fill in this area appears to be placed in loose conditions and may be subject to erosion (as evident by new shallow erosion gullies). The downstream slope east of the old coffer dam has extensive and deep erosion gullies (3 of which are up to 1 m deep).
SEEPAGE:	No seepage observed.
INSTRUMENTATION:	Three of the original four thermistors remain Dam 4. From east to west across the crest, the four cables are numbered TD4-1 to 4. Thermistor TD4-2 was reported destroyed.
MAINTENANCE RECOMMENDATIONS:	Corrective measures have been implemented to address seepage in area of coffer dam noted last year. However, infilling appears to be in a loose manner and may be subject to erosion. Surface compaction is recommended to improve erodability. Extensive erosion with gullies up to 1 m deep have formed along the eastern 2/3 of the dam and should be repaired.

CONCLUSIONS: Dam appears to be in a stable condition. Maintenance of extensive downstream erosion should be carried out to prevent further deterioration of the dam.

Dam 4: Overview

Dam 4: Downstream side, west end of dam. Area between Dam and downstream coffer dam recently infilled with esker material to mitigate seepage conditions note in last years inspection. Base on inspection of completed surface, fill appears to be placed in a loose manner.

Dam 4: Downstream slope. Loose surface and erosion gullies on new infill between dam and cofferdam.

Dam 4: Downstream slope in area of old coffer dam (cobble stone).

Dam 4: Downstream slope, east of cofferdam. Extensive erosion gullies (exposed geogrid).

Dam 4: Downstream slope, east of cofferdam. Extensive erosion gullies

Dam 4: Downstream slope, east of cofferdam. Extensive erosion gullies

Dam 4: Downstream slope, east of cofferdam. Extensive erosion gullies.

Dam 4: Downstream slope, east of cofferdam (looking west). Extensive erosion gullies

Dam 4: Upstream slope

Dam 4: Upstream slope.

DAM 5

LOCATION:	Southeast corner of Cell 3, just northwest of Dam 4.
FUNCTION:	Minor perimeter closure intended for future tails and water retention; currently functioning as a road embankment.
LENGTH:	250 +/- m
MAX HEIGHT:	1.5 +/- m above d/s tundra.
AS-BUILT CREST ELEVATION:	491.54 m
CREST WIDTH AND CONDITION:	Approximately 8 m wide and esker surfaced so that the dam may also function as roadway. Crest is in generally good condition.
RIPRAP:	Approximate slope of 3H:1V and in good condition.
BACKSLOPE:	About 1.5 to 2H:1V with till and esker sand. 2 small cracks noted along downstream shoulder along east half of dam (indication of possible shallow sloughing). A few small 150 mm deep erosion gullies have formed along downstream slope.
SEEPAGE:	No seepage observed. No water head being retained by the majority of structure.
MAINTENANCE RECOMMENDATIONS:	Downstream erosion should be maintained.
CONCLUSIONS:	The dam appears to be in a stable condition. Maintenance of downstream erosion recommended.

Dam 5: Upstream

Dam 5: Downstream

Dam 5: Downstream. Erosion gullies.

Dam 5: Downstream. Erosion gullies.

Dam 5: small crack near downstream shoulder

Dam 5: small crack near downstream shoulder

DAM 6

LOCATION:	West side of Cell 3 retaining tailings.
FUNCTION:	Minor perimeter closure. Retaining some tailing beach and ponded water on the northern portion of the dam.
LENGTH:	300 +/- m
MAX HEIGHT:	2.5 +/- m above d/s tundra.
AS-BUILT CREST ELEVATION:	490.25 m previously
CREST WIDTH AND CONDITION:	Approximately 10 m wide and esker surfaced to function as a roadway. Crest in good condition.
RIPRAP:	Not applicable for most of dam. Upstream side tailings have been covered with esker sand and gravel. Riprap along upstream slope in area of small upstream pond.
BACKSLOPE:	About 2H:1V with till and esker sand; extensive erosion gullies have now formed along downstream slope (up to 0.5 m deep).
SEEPAGE:	No seepage observed.
MAINTENANCE RECOMMENDATIONS:	Backfilling of ponded area may be considered (as previously recommended). Maintenance of downstream erosion is recommended.
CONCLUSIONS:	The dam appears to be in a stable condition. Maintenance of downstream erosion is recommended.

Dam 6: Upstream

Dam 6: Upstream. Riprap in area of small pond.

Dam 6: Upstream

Dam 6: Downstream. Erosion gullies.

Dam 6: Down stream erosion gullies.

REFERENCES

TBT Engineering Limited, 2009 Annual Geotechnical Inspection, Perimeter Dams Tailing Containment Area, Lupin Mine, Nunavut, Prepared for MMG Rsources Inc., Reference No. 09-161, December 1, 2009.

BGC Engineering Inc.,2008 Geotechnical Inspection fo Perimeter Tailings Dams, Lupin Mine Nunavut, Report submitted to OZ Minerals Canada Ltd., Project No. 0385-007-03, December 17, 2008, 14 pages plus figures and appendices.

BGC Engineering Inc.,2007 Geotechnical Inspection fo Perimeter Tailings Dams, Lupin Mine Nunavut, Report submitted to Zinafex Canada Inc., Project No. 0385-006-03, October 31, 2007, 14 pages plus figures and appendices

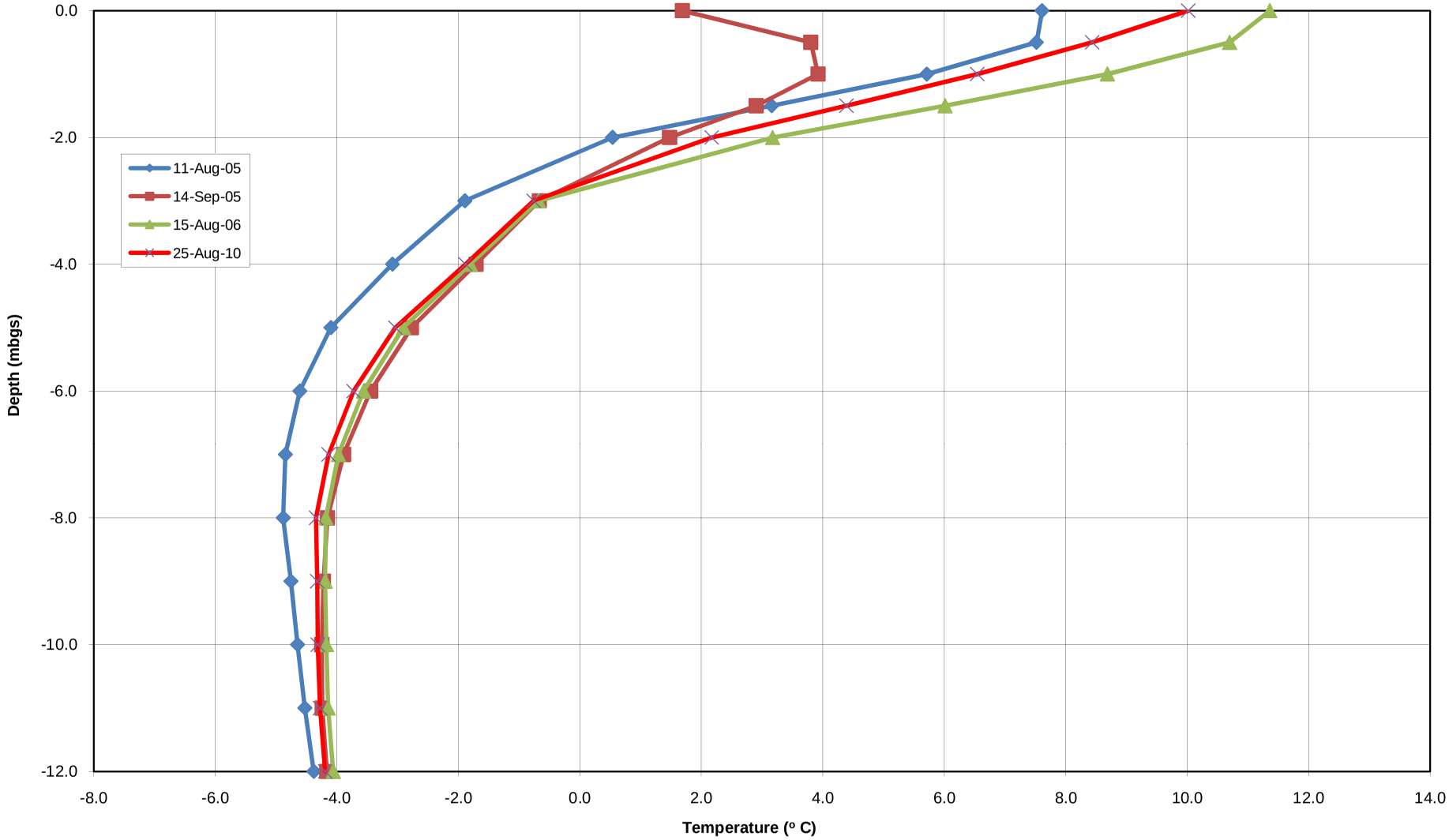
BGC Engineering Inc. 2003. Dam 6 Site Investigation and Raise Design, Lupin Mine, Nunavut. Report submitted to Kinross Gold Corporation, Project No. 0256-006, July 25, 2003, 31 pages plus figures and appendicies.

Golder Associated Ltd. 2004. 2004 Dam Safety Review, Perimeter Tailings Dams, Lupin Mine, Nunavut. Report submitted to Kinross Gold Corporation, Project No. 04-1321-022,December 2004, 36 pages plus figures and appendix.

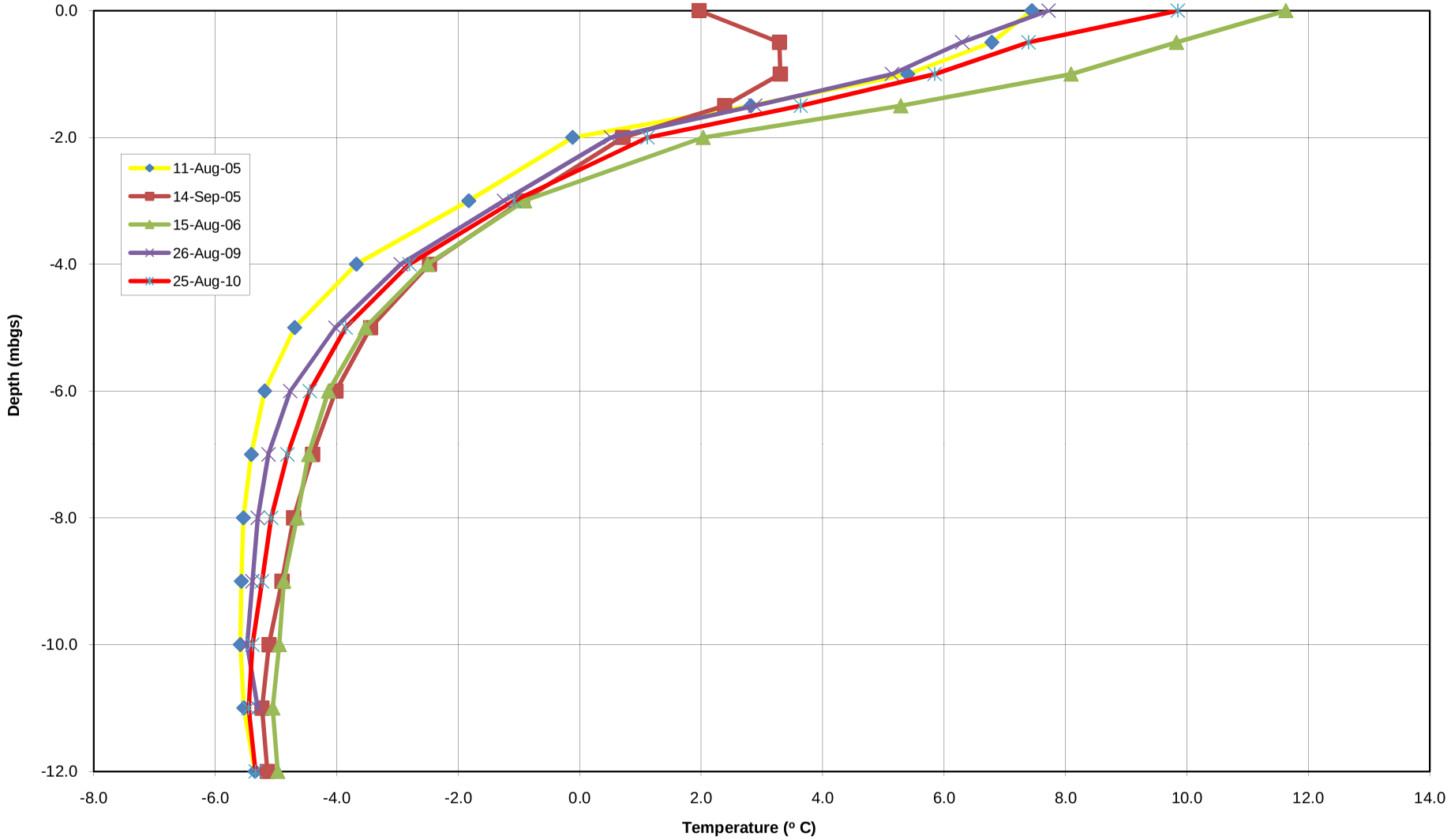
APPENDIX “B”

THERMISTOR DATA

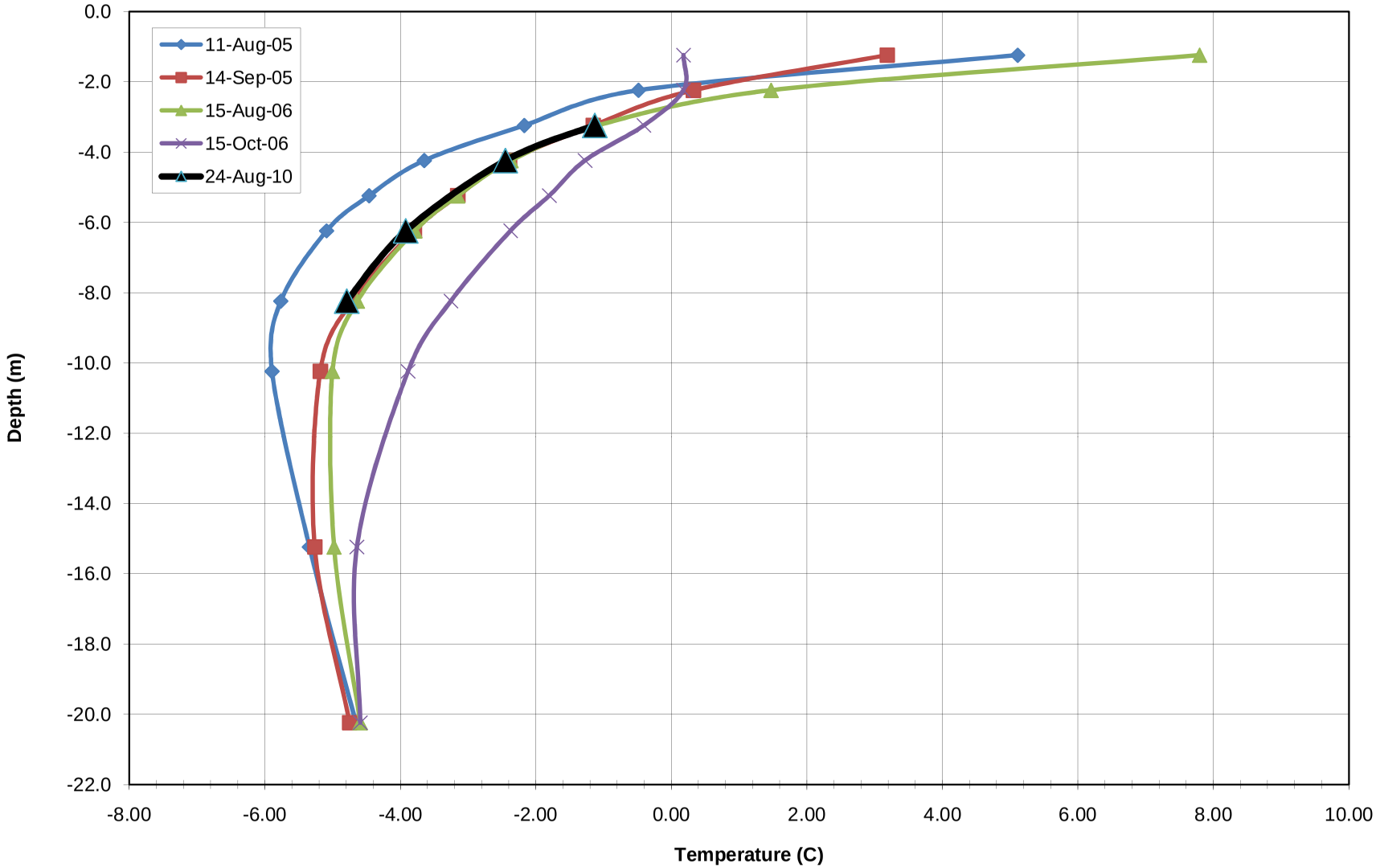
Thermistor D4-3 - Installed October 25, 1995
(Vertical Thermistor installed on the crest of Dam 4, West End, Just East of TD4-4)



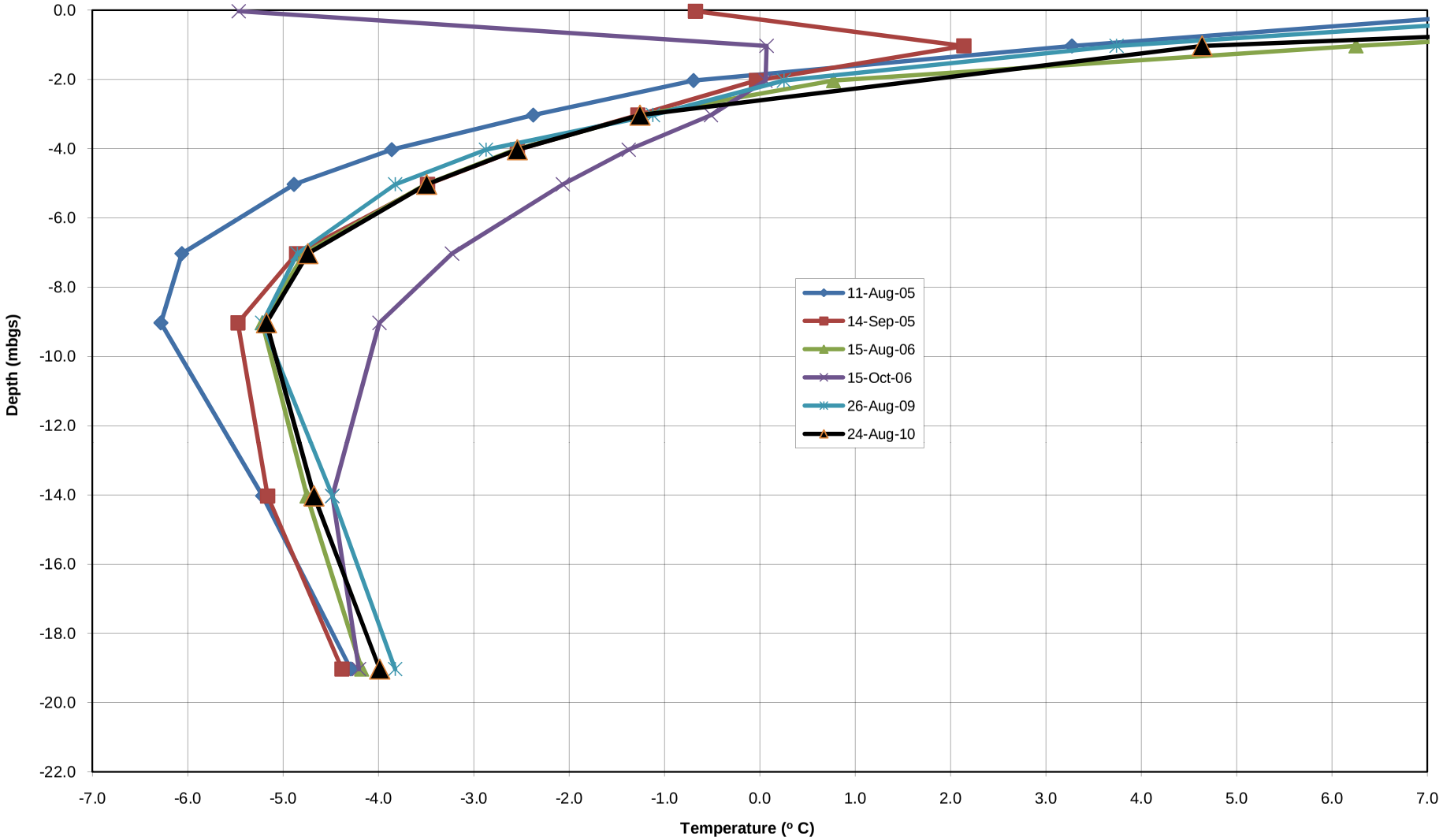
Thermistor D4-1 - Installed October 24, 1995
(Vertical Thermistor installed on the crest of Dam 4, Far East End)

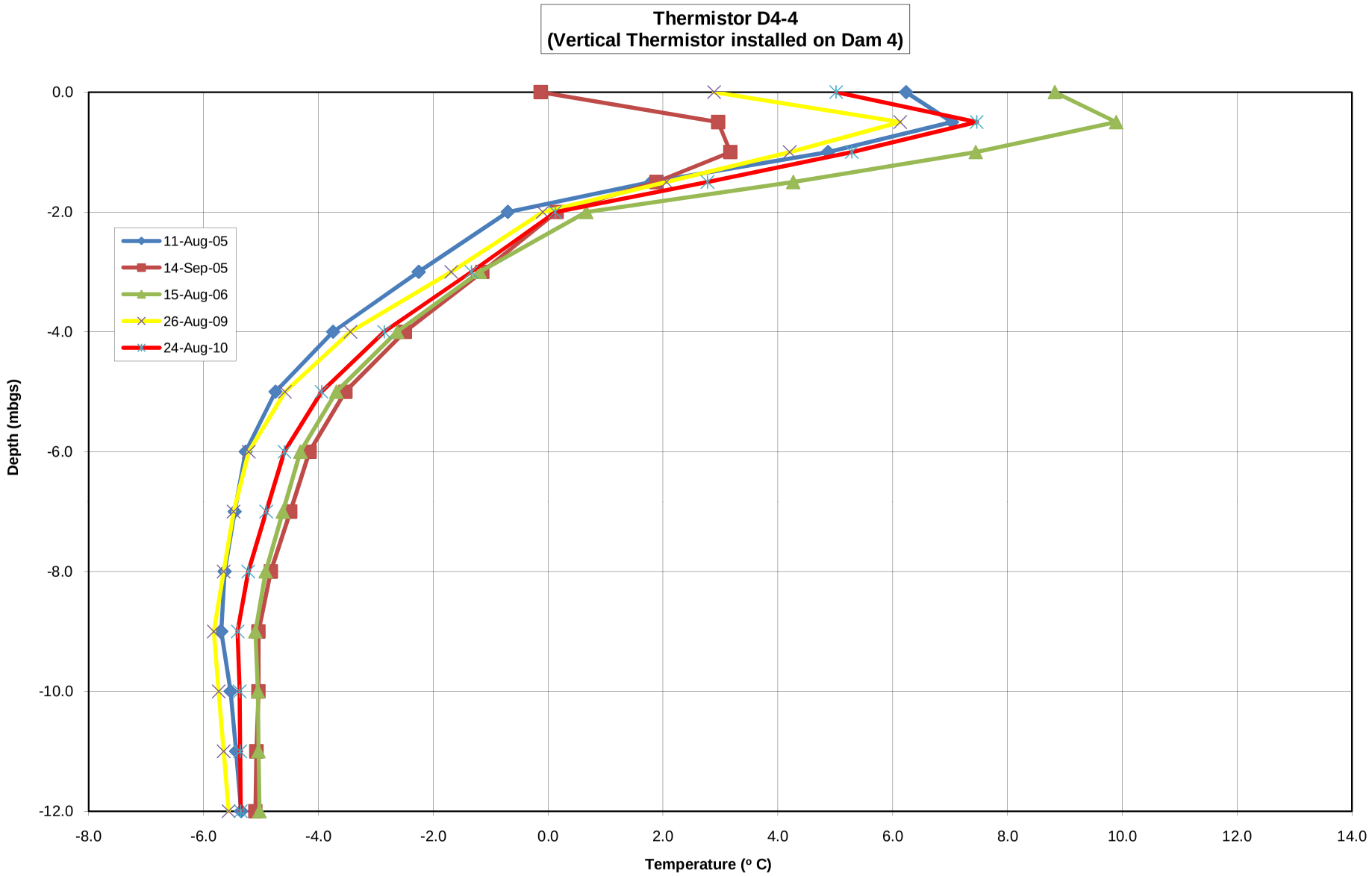


Thermistor D2-00-2 n- Installed November 8, 2000
(Vertical Termistor Installed on the crest of Dam 2, at the north end)



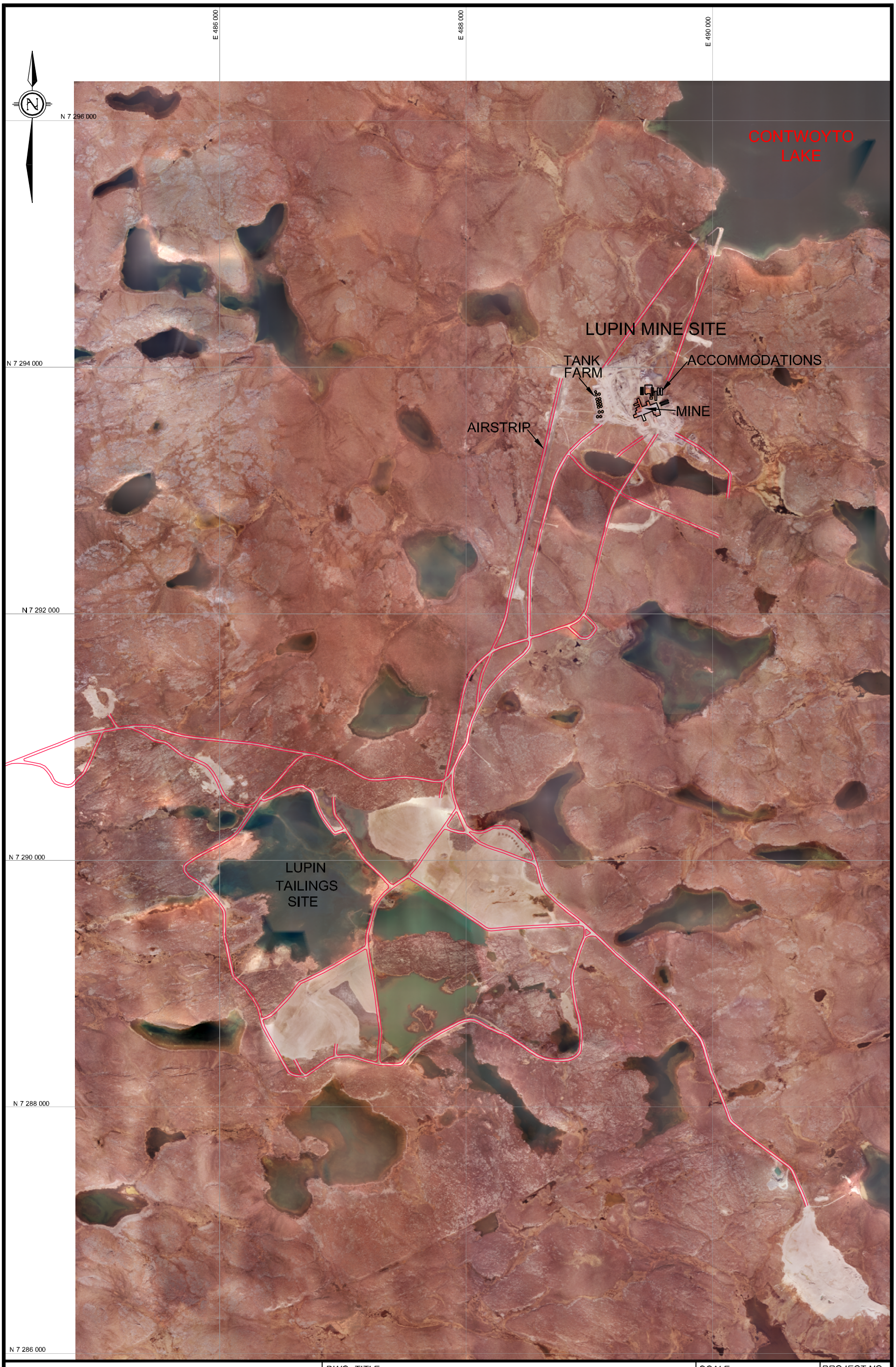
Thermistor D1A-00-01 - Installed November 9, 2000
(Vertical Thermistor installed on the crest of Dam 1A, south of Syphons)




Thermistor D4-4
(Vertical Thermistor installed on Dam 4)
Depth (mbgs)
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
11-Aug-05
14-Sep-05
15-Aug-06
26-Aug-09
24-Aug-10
-8.0
-6.0
-4.0
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Temperature (º C)

ENCLOSURES

CLIENT: MIN METALS GROUP LTD	DWG. TITLE: LUPIN FACILITY - OVERVIEW MAP	SCALE: 1:7,500	PROJECT NO. 10-069
TBT ENGINEERING CONSULTING GROUP	PROJECT: LUPIN MINE ANNUAL INSPECTION LUPIN FACILITY, NUNAVUT		DATE: OCT.2010
			ENCLOSURE 1



CLIENT:

MIN METALS GROUP

MMG

TBT ENGINEERING CONSULTING GROUP

DWG. TITLE:

LUPIN FACILITY AREA PLAN

SCALE:

1 : 30,000

PROJECT NO.

10-069

PROJECT:

LUPIN ANNUAL INSPECTION

LUPIN FACILITY, NUNAVUT

DATE:

OCT.2010

ENCLOSURE

2

Appendix D Reclaim Model

SUMMARY OF COSTS

Capital Costs

COMPONENT TYPE	COMPONENT NAME	TOTAL COST
OPEN PIT	0	$0.00
UNDERGROUND MINE	0	$404,115.78
TAILINGS	0	$2,563,155.00
ROCK PILE	0	$0.00
BUILDINGS AND EQUIPMENT	0	$5,960,318.56
CHEMICALS AND SOIL MANAGEMENT	0	$501,545.63
WATER MANAGEMENT	0	$0.00
POST-CLOSURE SITE MAINTENANCE		$0.00
SUBTOTAL		**$9,429,135**
		Percentages
MOBILIZATION/DEMOBILIZATION/FUEL	0	$5,533,533
MONITORING AND MAINTENANCE	0	$1,260,000
PROJECT MANAGEMENT	4 %	$377,165
ENGINEERING	4 %	$377,165
CONTINGENCY	10 %	$942,913
GRAND TOTAL - CAPITAL COSTS		**$17,919,912**

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
1	**excavate Rock, Bulk**					
	drill, blast, load short haul (<500m) Dump	RB1	m3	10.11	15.141	#N/A
	RB1 + long haul, up to 1500 m	RB2	m3	10.71	15.7899	#N/A
	RB1 + spread and compact	RB3	m3	10.71	15.7899	#N/A
	RB1 + long haul + spread and compact	RB4	m3	11.3	27.307875	#N/A
	RB1 + Specified activity	RBS	m3	#N/A	#N/A	#N/A
2	**excavate Rock, Controlled**					
	drill, blast, load short haul (<500m) Dump	RC1	m3	23.793	35.6895	#N/A
	RC1 + long haul, up to 1500 m	RC2	m3	11.3	16.33065	#N/A
	RC1 + spread and compact	RC3	m3	11.3	15.7899	#N/A
	RC1 + long haul + spread and compact	RC4	m3	11.99	17.011995	#N/A
	RC1 + Specified activity	RCS	m3	#N/A	#N/A	145
3	**excavate Soil, Bulk**					
	excavate, load short haul (<500m) dump	SB1	m3	3.4608	5.245275	#N/A
	SB1 + long haul, up to 1500 m	SB2	m3	4.30437	6.456555	6.32
	SB1 + spread and compact	SB3	m3	4.00155	5.742765	#N/A
	SB1 + long haul + spread and compact	SB4	m3	4.86675	9.679425	#N/A
	SB1 + Specified activity	SBS	m3	2.498265	6.89997	10.95
	Soil, tailings	SBT	m3	3.276945	7.732725	
4	**excavate Soil, Controlled**					
	excavate, load short haul (<500 m), dump	SC1	m3	6.067215	8.273475	#N/A
	SC1 + long haul, up to 1500 m	SC2	m3	7.516425	10.42566	#N/A
	SC1 + spread and compact	SC3	m3	6.067215	12.61029	#N/A
	SC1 + long haul + spread and compact	SC4	m3	6.81345	20.602575	#N/A
	SC1 + Specified activity	SCS	m3	#N/A	#N/A	15.75
	Geo-synthetics					
	geotextile, filter cloth	GST	M2	1.070685	2.14137	#N/A
	geogrid	GSG	M2	5.115495		#N/A

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
	liner, HDPE	GSHDPE	M2	6.370035		#N/A
	liner, PVC	GSPVC	M2			#N/A
	geosynthetic installation	GSI	m2	0.897645	1.03	#N/A
	bentonite soil ammendment	GSBA	tonne	273.6195	309.309	#N/A
	Shaft, Raise & Portal Closures					
	Cap Shafts	SR	ea	573.195	1892.625	74732.46
	Portals	POR	m3	0	221.7075	1000
5	**Concrete work**					
	Small pour, no forms	CS	m3	321.2055	643.4925	#N/A
	Large pour, no forms	CL	m3	254.1525	378.525	#N/A
	Small pour, Formed	CSF	m3	378.525	1892.625	#N/A
	Large pour, Formed	CLF	m3	313.635	443.415	#N/A
6	**Vegetation**					
	Hydroseed, Flat	VHF	ha	1724.9925	5353.425	#N/A
	Hydroseed, Sloped	VHS	ha	1998.612	6007.7325	#N/A
	veg. Blanket/erosion mat	VB	ha	11896.5	14275.8	#N/A
	Tree planting	VT	ha	11896.5	14275.8	#N/A
	Wetland species	VW	ha	59482.5	89223.75	#N/A
7	**Pumps**					
	Small, <	PS	each	3244.5	6489	#N/A
	Large, >	PL	each	5407.5	108150	#N/A
8	**PiPes**					
	Pipes >6 inches	PPS	m	0.54075	5.4075	10.89
	Fuel Contaminated	PPL	m	1.0815	194.67	50.02

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
9	**pump sand BackFill**	BF	m3	5.94825	17.84475	#N/A
10	**Fence**	F	m	11.8965	178.4475	#N/A
11	**Signs**	S	each	11.8965	35.6895	#N/A
12	**rock, Drill and Blast only**	DB	m3	11.8965	23.793	#N/A
	(flatten slope, collapse drift)					
13	**excavate Rip Rap**					
	drill, blast, load short haul (<500 m) dump and spread	RR1	m3	11.842425	17.682525	#N/A
	RR1 + long haul	RR2	m3	12.00465	18.331425	#N/A
	excavate rock from waste dump, short haul, spread	RR3	m3	4.5423	6.25107	#N/A
	RR3 + long haul	RR4	m3	5.06142	6.759375	#N/A
	specified rip rap source	RR5	m3	#N/A	#N/A	#N/A
14	**Import LimeStone**	ILS	tonne	9.5172	14.2758	#N/A
15	**Import LiMe**	ILM	tonne	178.4475	535.3425	#N/A
16	**Grouting**	G	m3	214.137	259.56	#N/A
17	**Dozing**					
	doze Rock piles	DR	m3	0.919275	2.108925	#N/A
	doze overburden/Soil piles	DS	m3	0.84357	3.363465	#N/A
18						#N/A
						#N/A
19						#N/A
						#N/A
20			each	0	0	#N/A
			each			#N/A
21	**Buildings - Decontaminate**					

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
	Isolate (glycol, water,sewer,power)	BDC	m2	#N/A	#N/A	11.02
	Asbestos	BDA	m2	22.7115	45.423	#N/A
22	**Buildings - Remove** areas are per floor on 3 m average height					
	Wood - teardown	BRW1	m2	23.25225	35.6895	#N/A
	Wood - burn	BRW2	m2	5.94825	11.8965	#N/A
	Masonry	BRM	m2	25.577475	35.6895	#N/A
	Concrete	BRC	m	35.6895	53.53425	6.36
	Steel - teardown	BRS1	m2	38.0688	57.1032	125.56
	Tanks	BRS2	m3	59.4825	89.22375	22.26
23	**Power & Pipe Lines**					
	Power lines, remove	POWR	each	22.60335	4996.53	#N/A
						#N/A
24	**Laboratory Chemicals**					
	Remove from site	LCR	pallet	1892.625	2509.08	#N/A
	Dispose on site	LCD	each	#N/A	#N/A	#N/A
25	**PCB - Remove from site**	PCBR	litre	35.6895	41.63775	#N/A
26	**Fuel**					
	Remove from site	FR	kg	0	1.10313	#N/A
	Burn on site	FB	kg	#N/A	#N/A	#N/A
27	**Oil**					
	Remove from site	OR	litre	0.378525	1.10313	#N/A
	Burn on site	OB	litre	0.378525	0.594825	#N/A
28	**Process Chemicals**					
	Remove from site	PCR	kg	0.378525	2.217075	#N/A
	Dispose on site	PCD	kg	#N/A	#N/A	#N/A
29	**Explosives**					
	Remove from site	ER	kg	0	2.3793	#N/A
	Dispose on site	ED	kg	#N/A	#N/A	#N/A

Unit Cost Table

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
30	**Contaminated Soils**					
	Remediate on site	CSR	m3	41.63775	129.78	52.5
	consolidate & cover	Use cost code items 1 - 4				
	cover in place	Use cost code items 1 - 4				
31	**Mobilize Heavy Equipment**					
	Mobilize	MHER	each	3.039015	9.10623	1811641.26
	Demobilize	MHEA	each	#N/A	#N/A	724802.56
32	**Mobilize Camp**					
	<20 persons Road access	MC<R	each	#N/A	#N/A	#N/A
	<20 persons Air access	MC<A	each	#N/A	#N/A	#N/A
33	**Mobilize Workers**					
	mobilize	MM<	person	208.7295	1070.685	#N/A
	>20 persons	MM>	person	1070.685	1427.58	#N/A
34	**ACCoModation**	ACCM	month	1427.58	2141.37	#N/A
35	**Mobilize Misc. Supplies**	MMS	each	#N/A	#N/A	#N/A
36	**Winter Road**	WR	km	1427.58	2833.53	#N/A
37	**Visual site Inspection**	VI	each	3806.88	7678.65	10000
38	**Survey site Inspection**	SI	each	#N/A	#N/A	#N/A
39	**Water Sampling**	WS	each	5948.25	9733.5	#N/A
40	**site inspection RePorT**	RPT	each	#N/A	11550	#N/A
41	**Security Guard**	SG	pers/mc	5665	8327.55	#N/A
42	**Maintain Pumping**	MP	month	3568.95	#N/A	#N/A
43	**Clear SpillWay**	CSW	each	2022.405	5710.32	#N/A
44	**Build Treatment Plant**					
	Small (< 1000 m3/d)	BTPS	lump su	1,081,500	2,163,000	#N/A
	Large (> 1000 m3/d)	BTPL	lump su	2,163,000	3,785,250	#N/A
45	**Operate Treatment Plant**	OTP	m3	0	2	#N/A
46	**SCariFY road and install water breaks**	SCFY	km	3,812	5,353	#N/A

Unit Cost Table

ITEM Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $
water treatment chemicals					
ferric sulphate	ferric	kg	0.724605		
ferrous sulphate	ferrous	kg	0.47586		
lime	lime	kg	0.32445		
hydrogen peroxide, 50%	hperox	kg	1.546545		
Sodium Metabisulfate	Nametab	kg	1.070685		
Caustic soda, 50%	caustic	kg	0.67053		
Sulfuric acid, 93%	sulfuric	kg	0.28119		
flocculant	flocc	kg	5.829285		
copper sulphate	copper	kg	0		
typical shipping, to Whitehorse or Yellowknife		kg	0.077868		
Typical Labour & Equipment Rates					
Site manager		$/hr	75.705	84	
Mine superintendent		$/hr	0	63	
Environmental coordinator		$/hr	0	63	
weld)		$/hr	54.075	63	
Equipment operator		$/hr	48.6675	57.75	
labour - skilled		$/hr	37.8525	39.9	
labour - unskilled		$/hr	34.608	36.75	
Security / first aid		$/hr	41.097	50.4	
Admin.		$/hr	45.423	51.45	
			0		
Front end loader, ?, Cat992		$/hr	0	346.5	
excavator, Cat235		$/hr	0	183.75	
dump truck - tandem		$/hr	0		
dump truck off road, Cat 777		$/hr	286.5975		
dozer, D8, D10		$/hr	183.855	315	

1 Underground Mine Name ____ UG Mine # *1*

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
A OBJECTIVE: CONTROL ACCESS					
Fence	m		#N/A	0	$0
. Signs	each		#N/A	0	$0
. Ditch, mat'l A	m3		#N/A	0	$0
. , mat'l B	m3		#N/A	0	$0
. Berm	m3		#N/A	0	$0
. Block adits	m3		#N/A	0	$0
. Cap shaft - 5	each	5	SRS	80823	$404,116
. Cap raise #1	m3		#N/A	0	$0
. Cap raise #2	m3		#N/A	0	$0
. Backfill adits	m3		#N/A	0	$0
. Backfill shaft	m3		#N/A	0	$0
. Backfill raise #1	m3		#N/A	0	$0
. Backfill raise #2	m3		#N/A	0	$0
. Backfill open stopes	m3		#N/A	0	$0
. Other			#N/A	0	$0
B OBJECTIVE: STABILIZE GROUND SURFACE					
. Backfill mine	m3		#N/A	0	$0
. Collapse crown pillar	m3		#N/A	0	$0
. Contour, mat'l A	m3		#N/A	0	$0
. , mat'l B	m3		#N/A	0	$0
. Maintain dewatering (see "MONITORING/MAINTENANCE" c			#N/A	0	$0
. Other			#N/A	0	$0
C OBJECTIVE: FLOOD MINE					
. Plug adits	m3		#N/A	0	$0
. Plug drillholes to surface	each		#N/A	0	$0
. Grouting	m3		#N/A	0	$0
. LIme addition, kg/m3 of water	tonne		#N/A	0	$0
. Lime, purchase and shipping	tonne		#N/A	0	$0
D OBJECTIVE: HAZARDOUS MATERIALS					
. remove hazardous materials	each		#N/A	0	
. remove/decontam. equipment	each		#N/A	0	$0
. Other			#N/A	0	$0
E SPECIALIZED ITEMS					
.			#N/A	0	$0
Subtotal					$404,116 Total U/G

1 ilings Impoundment Name: ____ Impoundment # *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
A	OBJECTIVE: CONTROL ACCESS					
	Fence	m		#N/A	0	$0
.	Signs	each		#N/A	0	$0
.	Ditch, mat'l A	m3		#N/A	0	$0
.	, mat'l B	m3		#N/A	0	$0
.	Berm	m3		#N/A	0	$0
.	Block roads	m3		#N/A	0	$0
.	Other			#N/A	0	$0
B	OBJECTIVE: STABILIZE EMBANKMENT					
.	Toe buttress, drain mat'l	m3		#N/A	0	$0
.	, fill mat'l A	m3		#N/A	0	$0
.	, fill mat'l B	m3		#N/A	0	$0
.	Rip rap	m3		#N/A	0	$0
.	Vegetate	ha		#N/A	0	$0
.	Raise crest	m3		#N/A	0	$0
.	Flatten slopes	m3		#N/A	0	$0
.	Other			#N/A	0	$0
C	OBJECTIVE: COVER TAILINGS					
.	Soil cover	m3	375000	SB2S	6.8351	$2,563,155
.	Rip rap	m3		#N/A	0	$0
.	Vegetate	ha		#N/A	0	$0
.	Other			#N/A	0	$0
D	OBJECTIVE: FLOOD TAILINGS					
.	Ditch, mat'l A	m3		#N/A	0	$0
.	, mat'l B	m3		#N/A	0	$0
.	Raise crest	m3		#N/A	0	$0
.	Other			#N/A	0	$0
E	OBJECTIVE: TREAT SUPERNATANT					
.	Pump water	m3		#N/A	0	$0
.	Supply reagents	tonne		#N/A	0	$0
.	Operate treatment plant	m3		#N/A	0	
.	Other			#N/A	0	$0
F	OBJECTIVE: UPGRADE SPILLWAY					
.	Excavate channel, mat'l A	m3		#N/A	0	$0
.	, mat'l B	m3		#N/A	0	$0
.	Concrete	m3		#N/A	0	$0
.	Rip rap	m3		#N/A	0	$0
.	Other			#N/A	0	$0
G	OBJECTIVE: STABILIZE DECANT SYSTEM					
.	Remove	m3		#N/A	0	$0
.	Plug/backfill	m3		#N/A	0	$0
.	Other			#N/A	0	$0
H	OBJECTIVE: REMOVE TAILINGS DISCHARGE					
.	Cyclones	m3		#N/A	0	$0
.	Pipe	m3		#N/A	0	$0
.	Other			#N/A	0	$0
I	SPECIALIZED ITEMS					

1 ilings Impoundment Name: ____ Impoundment # *1*

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
.			#N/A	0	$0
Subtotal					$2,563,155 Total Tailings

1 Building / Equip Name: ____ Bldg / Equip #: *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
A	OBJECTIVE: DISPOSE MOBILE EQUIPMENT					
	Decontaminate and ship off-site	each		#N/A	0	$0
.	Decontaminate, dispose on-site	each		#N/A	0	$0
.	Other	each		#N/A	0	$0
B	OBJECTIVE: DISPOSE STATIONARY EQUIPMENT					
.	Decontaminate and ship off-site	each		#N/A	0	$0
.	Decontaminate, dispose on-site	each		#N/A	0	$0
.	Other	each		#N/A	0	$0
C	OBJECTIVE: DISPOSE ORE CONCENTRATION EQUIPMENT					
.	Decontaminate crushing plant	each		#N/A	0	$0
.	Decontaminate tanks & plumb.	each		#N/A	0	$0
.	Remove tanks & plumbing	each		#N/A	0	$0
.	Other			#N/A	0	$0
D	OBJECTIVE: DISPOSE WATER TREATMENT EQUIPMENT					
.	Decontaminate tanks & plumb.	each		#N/A	0	$0
.	Remove tanks & plumbing	each		#N/A	0	$0
.	Other			#N/A	0	$0
E	OBJECTIVE: DECONTAMINATE BUILDINGS & TANKS					
.	Process plant, chemicals	each		#N/A	0	$0
.	Maintenance plant, chemicals	each		#N/A	0	$0
.	Camp	each		#N/A	0	$0
.	Bulk fuel storage	each		#N/A	0	$0
.	Power plant	each		#N/A	0	$0
.	Explosives plant	each		#N/A	0	$0
F	OBJECTIVE: MOTHBALL BUILDINGS					
.	Sleepers and Offices	m2	7329	BRS1S	135.793	$995,228
.	Hoist Room and Travel Ways	m2	463	BRS1S	135.793	$62,872
.	Shaft House	m2	1253	BRS1S	135.793	$170,149
.	Warehouse	m2	4671	BRS1S	135.793	$634,290
.	Mill	m2	2864	BRS1S	135.793	$388,912
.	Powerhouse	m2	1645	BRS1S	135.793	$223,380
.	Headframe	m2	413	BRS1S	135.793	$56,083
.	Airlock Building and Freshair Intake	m2	366	BRS1S	135.793	$49,700
.	Pastefill Plant	m2	316	BRS1S	135.793	$42,911
.	Cold Storage 2 buildings	m2	1855	BRS1S	135.793	$251,896
.	Surface Mobile Shop	m2	1008	BRS1S	135.793	$136,879
.	Carpenter Shop	m2	482	BRS1S	135.793	$65,452
.	As Treatment Plant Building	m2	177	BRS1S	135.793	$24,035
.	Pumphouse	m2	74	BRS1S	135.793	$10,049
.	Explosives Storage	m2	412	BRS1S	135.793	$55,947
.	Fire house	m2	31	BRS1S	135.793	$4,210
.	Emergency Power House	m2	117	BRS1S	135.793	$15,888
.	Weather Station and Storage Buildings	m2	566	BRS1S	135.793	$76,859
.	Shop	m2	379	BRS1S	135.793	$51,466
.	Batch Plant	m2	118	BRS1S	135.793	$16,024
.	ATV Building	m2	172	BRS1S	135.793	$23,356
I	OBJECTIVE:REMOVE TANKS /PIPES					
.	3 - 360,000 gallon tanks	m3	4098	BRS2S	24.0742	$98,656
.	7 - 350,000 gallon tanks	m3	9275	BRS2S	24.0742	$223,288

1 **Building / Equip Name:** ____ **Bldg / Equip #:** *1*

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
.	3 - 187,000 gallon tanks	m3	2124	BRS2S	24.0742	$51,134
.	6- 14,000 gallon tanks	m3	318	BRS2S	24.0742	$7,656
.	11 - 20,000 gallon tank	m3	825	BRS2S	24.0742	$19,861
.	2- 5,000 gallon tanks	m3	19	BRS2S	24.0742	$457
.	Piping	m	1000	PPLS	54.0966	$54,097
J	OBJECTIVE: LANDFILL FOR DEMOLITION WASTE					
.	Isolate Buildings (waste,water,glycol,sew	m2	24562	BDCS	11.9181	$292,733
.	Bone Yard Clean Up		1	#N/A	272590	$272,590
.	Operation of Landfill		1	#N/A	283716	$283,716
K	OBJECTIVE: GRADE AND CONTOUR					
.	Grade/Contour Entire Mine Site Area	m2	230000	SB2L	4.65518	$1,070,691
.	Place soil cover	m3		#N/A	0	$0
.	Rip rap on ditches	m3		#N/A	0	$0
.	Vegetate	ha		#N/A	0	$0
.	Concrete Slab Removal	m2	25000	BRCS	6.87834	$171,959
L	OBJECTIVE: RECLAIM ROADS					
.	Scarify and install water breaks	km	10	SCFYH	5789.73	$57,897
.	Vegetate	ha		#N/A	0	$0
.				#N/A	0	$0
K	SPECIALIZED ITEMS					
.				#N/A	0	$0
	Subtotal					$5,960,319
						Total Buildings

1 Chemicals and Soil Contamination: 1

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
	Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.					
A	LABORATORY CHEMICALS					
.		pallet		#N/A	0	$0
B	PCB, hauling	litre		#N/A	0	$0
.	PCB, disposal	litre		#N/A	0	$0
C	FUEL			#N/A		$0
.	Type 1	kg		#N/A	0	$0
.	Type 2	kg		#N/A	0	$0
.	Type 3	kg		#N/A	0	$0
D	WASTE OIL					
.	Oils/lubricants - burn on-site	litre		#N/A	0	$0
.	Oils/lubricants - ship off-site	litre		#N/A	0	$0
.	Oils/lubricants - disposal fee	litre		#N/A	0	$0
E	PROCESS OR TREATMENT CHEMICALS					
.	Type 1	kg		#N/A	0	$0
.	Type 2	kg		#N/A	0	$0
.	Type 3	kg		#N/A	0	$0
.	Type 4	kg		#N/A	0	$0
F	EXPLOSIVES	kg				
.				#N/A		$0
G	CONTAMINATED SOILS					
.	Type 1, light fuel	m3		#N/A	0	$0
.	Type 2, heavy fuel and oil	m3	7500	CSRS	$56.78	$425,841
.	Type 3, metals	m3		#N/A	0	$0
H	Haz. Mat. testing & assessment					
.	Technician and analyses	each	1	#N/A	0	$37,853
.	Drilling	each	1	#N/A	0	$21,630
.	Report	each	1	#N/A	0	$16,223
.	OTHER					
.				#N/A	0	$0
	Subtotal					$501,546 Total Chemical

1 **Mobilization Name:** **Mob # *1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
A MOBILIZE HEAVY EQUIPMENT					
Equipment to regional centre					
. Mobilization - ICE ROAD	ea	1	MHERS	1959290	$1,959,290
. Demobilization - ICE ROAD	ea	1	MHEAS	783873.97	$783,874
.	km		#N/A	0	$0
.	km		#N/A	0	$0
Equipment, regional centre to site					
. Excavators	km		#N/A	0	$0
. Dump trucks	km		#N/A	0	$0
. Dozers	km		#N/A	0	$0
. Demolition shears	km		#N/A	0	$0
B MOBILIZE CAMP					
.			#N/A		$0
C MOBILIZE WORKERS	nanday				
.			#N/A	0	$0
D MOBILIZE MISC. SUPPLIES					
. Fuel	litre	2790369	#N/A	1	$2,790,369
. Minor tools and equipment	owance		#N/A	0	$0
. Truck tires	owance		#N/A	0	$0
E MOBILIZE & HOUSE WORKERS	person days				
.			#N/A		$0
. WINTER ROAD					
. Full winter use	km		#N/A	0	$0
. Limited winter use	km		#N/A	0	$0
.			#N/A	0	$0
F BONDING lump sum					
.			#N/A		$0
G TAXES lump sum					
.			#N/A		$0
H INSURANCE lump sum					
.			#N/A		$0
Subtotal					$5,533,533 Total Mob.

1 Monitoring & Maintenance Mon / Mtce # *1*

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost
A OBJECTIVE: INSPECTIONS					
Annual geotechnical insp.	each	5	#N/A	$20,000	$100,000
. Monitoring years 1-5	year	3	#N/A	$350,000	$1,050,000
. EEM	each	1	#N/A	$110,000	$110,000
.	each		#N/A	$0	$0
.	each	0	#N/A		$0
B OBJECTIVE: MAINTENANCE					
. Security guard	month		#N/A	$0	$0
. Accomodation	month		#N/A	$0	$0
. Maintain pumping	month		#N/A	$0	$0
. Clear spillway	each		#N/A	$0	$0
. Other					
			#N/A		$0
Subtotal					$1,260,000 Total Pits